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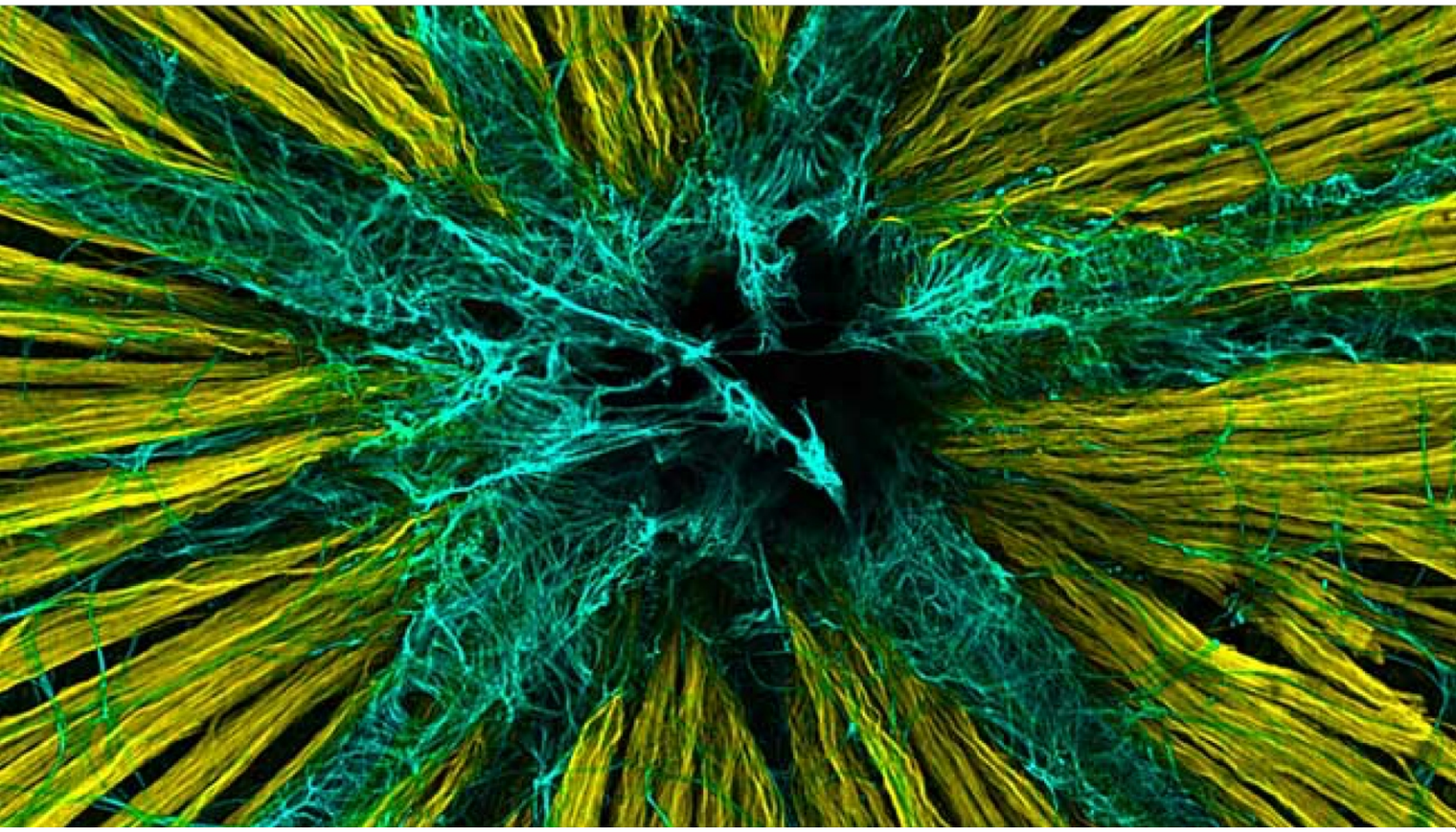

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PROLOGUE

NEURONA, as the official scientific journal of the Indonesian Neurological Association (PERDOSNI), has been continuously published since 2007. Marking a new milestone, the journal proudly presents this supplementary edition, published in collaboration with the ASEAN Neurological Association 2025 (ASNA 2025).

This supplementary edition compiles 281 abstracts submitted for the meeting, encompassing a broad range of topics in neurology, including stroke, neurointervention, neuroimaging, neuro-otology and neuro-ophthalmology, neurorestoration and neuroengineering, neuroepidemiology, as well as ethics and law.

It is our earnest hope that this supplementary edition will broaden readers' scientific perspectives and serve as a catalyst for further research and publication in the field of neurology. We also believe that partnerships through media collaborations in neurological scientific events will help ensure the sustainability of this journal, which represents the collective effort of all neurologists in Indonesia.

We extend our deepest appreciation for the continued support and collaboration that have made this publication possible.

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ABSTRACT

CLINICAL, SUBCLINICAL FEATURES AND RELATED FACTORS OF CARDIOVASCULAR AUTONOMIC NEUROPATHY IN DIABETIC PATIENTS

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Background: Cardiovascular autonomic neuropathy (CAN) is a serious and frequently overlooked complication of type 2 diabetes mellitus (T2DM) due to the non-specificity of its early clinical manifestations, such as dizziness and palpitations. The concept of "silent CAN" refers to subclinical autonomic dysfunction without clear symptoms, emphasizing the critical need for early identification through careful assessment of clinical features and associated risk factors to improve long-term cardiovascular outcomes.

Objectives: To characterize the clinical and subclinical features of CAN and to identify its associated risk factors in patients with T2DM.

Methods: A cross-sectional study was conducted in 85 patients with T2DM at University Medical Center at Ho Chi Minh City from January 2020 to June 2024. CAN was diagnosed and classified according to the 2011 Toronto Consensus criteria, through the cardiovascular autonomic reflex tests (CARTs) in combination with clinical evaluations and laboratory investigations.

Results: The mean age of participants was 67.8 ± 12.9 years and the mean duration of diabetes was 11.2 ± 6.2 years. Among the 85 patients, 49 patients were diagnosed with CAN, with 34.55% having severe CAN. Common clinical manifestations included dizziness (88.1%), nocturia (69%), and limb weakness (45.3%). Abnormal heart rate variability in the Valsalva maneuver (83.6%) and in response to postural changes (56.4%) were the most frequent findings on CARTs. Factors significantly associated with the presence of CAN included obesity, kidney disease and retinopathy, using high doses of metformin, long duration of diabetes, high resting heart rate, LDL cholesterol levels, glomerular filtration rate and HbA1c levels.

Conclusion: The proportion of severe CAN is quite high, highlighting a strong association with the duration of diabetes, comorbidities and metabolic syndrome, which collectively increase cardiovascular morbidity. Regular screening of CAN should be integrated into routine diabetic care to mitigate progression and reduce the burden of cardiovascular complications and CAN-associated disabilities.

Keywords: cardiovascular autonomic neuropathy, cardiovascular autonomic reflex tests, Valsalva maneuver

STROKE SUBTYPES, MECHANISMS AND RISK FACTORS IN SOUTH-EAST ASIA

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Background: South-East Asia (SEA) is home to 675 million people living in 12 countries. Stroke is a major cause of death and disability globally, and a leading cause of chronic disease burden in SEA.

Objective: This study reviews recent published data on stroke subtypes, mechanisms and risk factors among hospitalised stroke patients in SEA.

Methods: A Pubmed search of hospital-based stroke registries was performed. The search terms 'stroke' AND ('Brunei OR Burma OR Myanmar OR Cambodia OR Indonesia OR Laos OR Leste OR Malaysia OR Papua OR Philippines OR Singapore OR Thailand OR Vietnam') were used. All available years were included, til 31 December 2024. The titles then s were reviewed, full papers were obtained where possible. Inclusion criteria were 1. Hospitalised patients were studied 2. All acute strokes included, or all ischaemic strokes (IS) subtyped by TOAST criteria. Data was extracted on stroke subtypes (IS, intracerebral haemorrhage ICH, subarachnoid haemorrhage SAH), mechanisms of IS (based on TOAST criteria), and stroke risk factors. Recent multi-centre studies were preferred over single-centre stuies.

Results: A total of 7099 papers were identified by the search terms. Among 8 countries, IS was the most frequent subtype (61.4-80%) except for Myanmar where HS was almost more frequent (49.2%) than IS. Among 4 countries, Small Artery Occlusion was the most common IS mechanism (37-42.3%), though Large Artery Atherosclerosis was the most frequent in Indonesia (59.6%). Hypertension was the most common stroke risk factor, highest in Indonesia (82.3%) and lowest in Thailand (53%). There was variability in the frequency of diabetes mellitus, hyperlipidaemia, smoking, previous stroke/TIA, atrial fibrillation, and ischaemic heart disease.

Conclusions: There are variations in characteristics among hospitalised stroke patients in SEA. Multi-centre studies are needed to corroborate these findings and investigate differences.

Keywords: stroke, subtypes, mechanisms, risk factors

RESULTS OF REPERFUSION THERAPY FOR PATIENTS WITH ACUTE ISCHEMIC STROKE DUE TO LARGE-VESSEL OCCLUSION OF THE VERTEBROBASILAR VASCULATURE

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Background: Current guidelines of AHA/ASA and ESO focus mainly on reperfusion therapy in acute ischemic stroke due to LVO of the anterior circulation, without consensus recommendations for endovascular therapy in LVO of the posterior circulation. There is one controvesy question: whether the endovascular therapy can be effective and safe in treatment of acute ischemic stroke due to LVO of the vertebrobasilar vasculature.

Objective: Providing further evidence on the safety and effectiveness of endovascular therapy through a prospective comparative cohort study.

Methods: Prospective cohort study included 131 patients with acute ischemic stroke due to LVO of the vertebrobasilar vasculature within 24 hours from onset who were admitted at the Stroke Center of Bach Mai Hospital, the study was launched in period of 12 months (from December 2023 to November 2024). The study was approved by the Ethics Council in Biomedical Research of Bach Mai Hospital under Decision No. 6843/QD-BM dated November 20, 2023.

Result: There were 70/131 patients in the endovascular intervention group and 61/131 patients in the non-endovascular intervention group. The percentage of the improved functional outcome (90-day mRS from 0-3) in the endovascular intervention group was higher statistically significant than its in the non-endovascular intervention group (25,8% and 9,9%, p = 0,019). There was statistically significant difference in the percentage of the 90th day mortality between the two groups (22,8% and 66,8%, p = 0,001). The rate of symptomatic bleeding transformation in the endovascular intervention group was higher than its in the non-endovascular intervention group (p=0,001).

Conclusion: For acute ischemic stroke due to LVO of the vertebrobasilar vasculature, endovascular intervention can help to increase the percentage of the 90th day improved functional outcome (mRS from 0-3) and to decrease the percentage of the 90th day mortality, however, the endovascular intervention aslo makes the rate of symptomatic bleeding transformation increase.

Keywords: acute ischemic stroke, large-vessel occlusion (LVO), the vertebrobasilar vasculature, endovascular intervention

OUTCOME OF ACUTE ISCHAEMIC STROKE PATIENTS DURING THE FIRST DECADE OF THROMBOLYSIS IN MYANMAR

Khin Myat Po Po Kyaw[1], Zin New Win[1], Htet Htet Lin[1], Zarni Myint Shwe[1], Moe Zaw Myint[1], San Oo, Moe Moe Zaw[1]
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Background and Objectives: Acute ischemic stroke (AIS) is a leading cause of morbidity and mortality in Myanmar with its burden increasing over the past decades. Timely restoration of blood flow using intravenous

thrombolysis (IVT) and/or mechanical thrombectomy significantly improves functional outcomes. However, only IVT has been available in Myanmar since 2015. The objective of the study was to evaluate the outcomes of thrombolysis for acute ischemic stroke patients from 2015 to 2024, focusing on door-to-needle time (DNT), functional outcomes, and thrombolysis-related complications.

Method: A retrospective analysis was conducted on AIS patients who received IVT at Yangon General Hospital and other thrombolysis available hospitals during the study period. Data collected included patient demographics, DNT, mean baseline National Institutes of Health Stroke Scale (NIHSS) scores, and modified Rankin Scale (mRS) scores at 90 days. Thrombolysis-related complications, including symptomatic intracerebral hemorrhage were also recorded. The primary endpoint was a ≥4-point improvement in NIH Stroke Scale *(NIHSS)* at 24 hours and secondary endpoints was mortality and disability at days 90 as a favorable outcome of mRS ≤2.

Results: A total of (540)acute ischemic stroke patients received thrombolytic therapy during the study period representing 20% of stroke fast track cases. The mean age was 62 years, mean baseline NIHSS was 12, and mean hours of symptoms onset to arrival of hospital was 1.8 hours. The median DNT was 58 minutes. (45.1%) of patients achieved a good functional outcome mRS ≤2.The overall complications including symptomatic hemorrhage was (9 %)and overall mortality rate was (8.4%).

Conclusion: Although stroke care services in Myanmar remains in its early stages compared to global standards, thrombolysis services have shown progressive improvements in DTN and functional outcomes over the past decade. This is the very early experience of thrombolysis in our stroke care services which gives more promising factors to improve the future plan of stroke care services.

PROGNOSTIC VALUE OF ATHEROGENIC INDEKS OF PLASMA IN DETERMINING CEREBRAL LESION BURDEN AND NEUROLOGICAL IMPAIRMENT IN ACUTE ISCHEMIC STROKE

Arifian Wijaya Lana Putra, Muhammad Yunus Amran, Mimi Lotisna

Introduction: The triglyceride/high-density lipoprotein cholesterol Log(TG/HDL-C) ratio is characterized as the serum atherogenic indeks of plasma. A high TG/HDL-C ratio is associated with vascular conditions, insulin resistance, and metabolic syndrome. Cerebrovascular diseases have recognized the importance of the lipid profile linked to atherogenic index of plasma. However, there are still relatively few studies exploring the Atherogenic Index of Plasma (AIP) in relation to these conditions, especially ischaemic stroke.

Aim: This study aim to find out the association between atherogenic index of plasma with CT (Computed Tomography) cerebral lesion burden and neurological impairment in ischemic stroke.

Methods: Patients with acute ischemic stroke (AIS) admitted between January until December 2023 were retrospectively enrolled in this study. The AIP was determined using the subsequent formula derived from blood test: AIP=log [triglyceride (mg/dL)/high-density lipoprotein cholesterol (mg/dL)]. AIP was classified into mild (<0.11), moderate (0.11-0.21), severe (>0.21). Statistical analysis were processed with SPSS version 24.0 software, presented in frequency distribution tables, and discussed.

Results: 103 acute ischemic stroke patients, average age was 60.20 years, with 51 females (49,5%) and 52 males (50,5%). The Association between Atherogenic Index of Plasma and CT cerebral lesion burden, as well as neurological impairment (NIHSS score), is statistically significant with a positive relationship with CT cerebral lesions and neurological impairment, respectively r= +0.825; p<0.001 and r=+0.602; p<0.001.

Conclusion: This study demonstrates a significant association between high serum atherogenic index of plasma with multiple CT cerebral lesions and severe neurological impairment of ischemic stroke. This simple, inexpensive and effective test method can prevent the occurrence of ischemic stroke.

Keywords: Atherogenic Index of Plasma, Cerebral lesion, Ischemic Stroke

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF CEREBROVASCULAR DISEASE PATIENTS AT BORONG REGIONAL HOSPITAL: EVALUATING THE HASANUDDIN SCORE AS A DIAGNOSTIC ALTERNATIVE IN THE ABSENCE OF COMTUPED TOMOGRAPHY IMAGING

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Background: Cerebrovascular Disease remains a major public health issue in rural Indonesia, where limited access to diagnostic imaging poses challenges for timely and accurate stroke type differentiation. This underscores the need for practical diagnostic tools that do not rely on advanced technology.

Objective: This study aimed to describe the demographic and clinical characteristics of stroke patients at Borong Regional Hospital and to evaluate the effectiveness of the Hasanuddin Score as an alternative tool for distinguishing stroke types in resource-limited settings.

Methods: A descriptive cross-sectional study was conducted involving 168 stroke patients admitted to Borong Regional Hospital. Data collected included demographics (age, gender, residence), clinical features, CT-scan results (if available), and risk factors. Consumption patterns of traditional arak were also assessed. The Hasanuddin Score was compared with available CT-scan findings to evaluate its diagnostic accuracy.

Results: The mean age of patients was 56.59 ± 9.37 years, most (42.3%) aged 50–59 years and 54.2% being male. Non-hemorrhagic stroke (NHS) accounted for 75.6% of cases, while hemorrhagic stroke (HS) made up 24.4%. HS patients had significantly higher NIHSS scores (21.05 ± 4.10) than NHS patients (10.45 ± 5.72, p<0.001). Hypertension (79.8%) and alcohol consumption (47.0%) were the most common risk factors. CT scans were performed in 22.0% of patients, mainly in HS cases. The Hasanuddin Score demonstrated strong diagnostic performance, with 94.1% sensitivity, 80.0% specificity, and 86.5% overall accuracy.

Conclusion: The Hasanuddin Score is a valuable tool for differentiating stroke types in areas lacking CT-scan access. Its high diagnostic accuracy supports its use in clinical decision-making in rural Indonesia. These findings highlight the importance of improving diagnostic capacity and promoting culturally relevant stroke prevention strategies in rural Indonesia.

Research Etics: This research is currently under ethical review by the Health Research Ethics Committee of the Faculty of Medicine, Hasanuddin University and is in process of obtaining formal approval. The ethical clearence will be provided once issued.

Keywords: Stroke, Demographic profile, Clinical characteristics, Hasanuddin Score, CT scan, Healthcare access

INTER-ETHNIC DIFFERENCES IN STROKE RECURRENCE - A MULTI-CENTRE ASIAN STUDY

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Background: There are inter-ethnic differences in stroke incidence. However, inter-ethnic differences in stroke recurrence has been poorly studied.

Objective: The aim of this study is to explore if there are inter-ethnic differences in stroke recurrence among stroke patients with symptomatic intracranial large artery atherosclerosis (ICAS)

Methods: This study is a post-hoc analysis of the Asian Registry of Intracranial Atherosclerosis (ARICAS), a prospective multicentre cohort study of patients admitted to one of six Asian centres for acute ischaemic stroke attributed to ICAS. Stroke due to ICAS was diagnosed when there was a ≥50% intracranial large artery stenosis ipsilateral to a non-lacunar infarct, without significant ipsilateral extracranial stenosis, cardiac cause or other mechanism found for the stroke. Data were collected on patient demographics including ethnicity, and vascular risk factors. Outcome of interest was stroke recurrence at any time during 12 months of follow-up.

Results: A total of 356 patients were recruited. Mean age was 62.7 ± 13.8 years, 39.9% were females. A total of 30.6% were Filipino, 28.9% Taiwanese/Chinese, 23.6% Indian, 14.0% Thai, and 2.8% Malay. The overall stroke recurrence was 6.7% (95% CI: 4.4-9.9%) within 1 year. Among Filipinos, it was 5.5% (95%CI: 2.6-11.5%), Taiwanese/Chinese 6.8% (95%CI: 3.3-13.4%), Indians 7.1% (95%CI: 3.3-14.4%), Thais 10.0% (95%CI: 4.4-21.4%), and Malays 0% (95%CI: 0-27.8%). On logistic regression, the risk of stroke recurrence had a borderline association with hypertension (OR: 2.86, 95% CI: 0.98-8.83, p = 0.05), but not ethnicity.

Conclusions: There were no inter-ethnic differences in 1-year stroke recurrence among Asian stroke patients with symptomatic intracranial large artery atherosclerosis. Further studies with larger patient numbers are needed to further investigate this.

Keywords: stroke, intracranial atherosclerosis, recurrence, inter-ethniRR01. Neuro-Vascular

COMPARATIVE ANALYSIS OF SERUM VASCULAR ENDOTHELIAL GROWTH FACTOR LEVELS IN COGNITIVE IMPAIRMENT PATIENTS WITH ACUTE ISCHEMIC STROKE

Dwi Atmaji Norwanto, Ashari Bahar, Muhammad Akbar

Background: Acute ischemic stroke is a condition that can cause long-term cognitive impairment due to brain damage caused by impaired blood flow. Vascular Endothelial Growth Factor (VEGF) is a protein involved in angiogenesis and vascular recovery, which can be affected in stroke patients. However, increased serum VEGF levels may also reflect the body's response to oxygen deprivation (hypoxia) caused by cerebral edema. This study aims to analyze and compare serum VEGF levels in patients with and without cognitive impairment with acute ischemic stroke.

Objective: This study aims to analyze and compare serum VEGF levels of acute ischemic stroke patients with and without cognitive impairment.

Methods: This study used a cross-sectional design with a sample of 43 patients who underwent hospitalization after experiencing acute ischemic stroke. Patients were divided into two groups: a group with post-stroke cognitive impairment and a group without post-stroke cognitive impairment. Serum VEGF levels were measured using the Enzyme-Linked Immunosorbent Assay (ELISA) method and analyzed to see the difference in VEGF levels between the two groups.

Result: The results showed differences in serum VEGF levels in acute ischemic stroke patients, where the mean Serum VEGF level in acute ischemic stroke patients with cognitive impairment was 222.03 ng/mL. While the mean serum VEGF level in acute ischemic stroke patients without cognitive impairment was 88.58 ng/mL. There was a p value of 0.000 (p<0.05) which indicates that there is a significant difference in serum VEGF levels in acute ischemic stroke with cognitive impairment.

Conclusion: The results of this study showed differences in serum VEGF levels in acute ischemic stroke patients, where acute ischemic stroke patients with cognitive impairment had higher VEGF levels. This finding may contribute to predicting cognitive impairment earlier and thus better prevention strategies can be done.

Keywords: VEGF, acute ischemic stroke, cognitive impairment, angiogenesisRR01. Neuro-Vascular

COMPARATIVE ANALYSIS OF HEALTHCARE UTILIZATION AMONG STROKE, HEART DISEASE, AND CANCER PATIENTS IN INDONESIA

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Background: Stroke, heart attack, and cancer represent leading contributors to morbidity and mortality in Indonesia, imposing a significant burden on the healthcare system[1]. Comprehensive evaluation of healthcare utilization patterns among these populations is essential for optimizing resource allocation and improving care delivery. This study examines differences in hospitalization frequency, outpatient service utilization, and medical check-up (MCU) rates among individuals with a history of these conditions.

Methods: A cross-sectional analysis was conducted using data from the Indonesian Family Life Survey 5 (IFLS5)[2] A total of 800 individuals with a documented history of either stroke, heart attack, or cancer were divided into three groups. Structured interviews were utilized to obtain self-reported hospitalization records in the last 12 months, outpatient visits in the last 4 weeks, and MCU frequency in the last 5 years. Hospitalization frequency comparisons were performed using the Kruskal-Wallis test, while outpatient service utilization and MCU rates were analyzed via Chi-Square tests.

Results: No statistically significant differences were observed in hospitalization frequency or MCU rates across the three disease groups. However, there are significant differences in outpatient service utilization, with stroke patients reporting the highest frequency (40.7%), followed by cancer (31.3%) and heart attack (22.9%) ($p < 0.05$).

Conclusion: The increased utilization of outpatient service among stroke patients may reflect the complex and sustained care requirements associated with post-stroke management[3]. While this finding highlights the substantial healthcare burden attributed to stroke, further investigation is needed to explore underlying determinants, including healthcare accessibility, cost implications, and long-term rehabilitative needs. Future research should focus on targeted strategies to enhance stroke care efficiency and mitigate its systemic impact on Indonesia's healthcare system.

ASSOCIATION OF TRIGLYCERIDE-GLUCOSE (TyG) INDEX WITH CLINICAL OUTCOMES IN ACUTE ISCHEMIC STROKE

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Background: Stroke remains a significant global burden, ranking as the second leading cause of death and the third leading cause of disability worldwide. Studies have shown that insulin resistance contributes to formation of thrombosis, development of atherosclerosis, and ischemic brain injury through inflammation, oxidative stress, and neuronal damage. Triglyceride-glucose (TyG) index is a simple and low-cost marker for assessing insulin resistance.

Objective: This study aims to investigate the association between TyG index and clinical outcomes in patients with acute ischemic stroke.

Methods: The study included eligible subjects with acute ischemic stroke from Stroke Registry of the Dr. Sardjito General Hospital in Yogyakarta from January 2023 to December 2024. Subjects were divided into two groups based on higher and lower TyG index values. TyG index was calculated from fasting triglyceride (TG) and fasting plasma glucose (FPG) at admission. The cut-off value of TyG index was determined by Receiver Operating Characteristic (ROC) analysis. The study evaluated functional outcome and neurologic worsening using modified Rankin Scale (mRS) and National Institutes of Health Stroke Scale (NIHSS) score.

Results: Among the 293 patients enrolled in the study, the mean age was 61.18 ± 12.8 years, and 56.7% were men. TyG index was higher in patients with poor functional outcome than those with good functional outcome (9.18 (7.73, 10.97) vs. 8.51 (7.43, 10.35). The cut-off value of TyG index was 8.79 (sensitivity = 84%, specificity = 82%). The occurrence of neurologic worsening was greater in patients with higher TyG index (19

patients) compared to lower TyG index (3 patients). There was a significant association between TyG index with functional outcome (p<0.001) and neurologic worsening (p= 0.003).

Conclusion: A higher TyG index at admission is associated with poor functional outcome and neurologic worsening of the patients with acute ischemic stroke.

Keywords: Triglyceride-glucose index, ischemic stroke, insulin resistance, functional outcome

MACHINE LEARNING ANALISYS TO PREDICT STROKE-ASSOCIATED INFECTIONS IN HEMMORHAGIC STROKE PATIENTS

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Background: Stroke-associated infections (SAI) are common complications in patients with hemorrhagic stroke and significantly contribute to increased morbidity, prolonged hospitalization, and higher mortality rates. Early identification of patients at high risk for SAI is essential to improve clinical outcomes and reduce healthcare burdens.

Objective: This study aims to explore the important characteristics in predicting the occurrence of SAI in hemorrhagic stroke patients using the available demographic, clinical, laboratory, as well as the clinical scoring variables.

Methods: We conducted a cross-sectional study using data from Stroke Registry of Dr. Sardjito General Hospital Stroke Unit between January 2020 and December 2024, including 446 patients diagnosed with hemorrhagic stroke. Machine learning models, including Random Forest, Logistic Regression, and XGBoost, were trained and validated using patient demographic, clinical, laboratory, and clinical scoring variables. Model effectiveness was assessed using precision, accuracy, sensitivity, specificity, and area under the curve (AUC)-receiver operating characteristic (ROC). The variables of importance in differentiating SAI and non-SAI using the most effective model were reported.

Results: All three machine learning models demonstrated relatively similar levels of sensitivity and specificity. However, Random Forest showed the most effective performance with the sensitivity of 68%, specificity of 51%, accuracy of 51%, and precision of 51%. In addition, Random Forest had the highest AUC-ROC compared to the other models. Five most significant variables in differentiating SAI and non-SAI in hemmorhagic stroke patients were Length of Stay (LoS), Blood Ureum Nitrogen (BUN), leucocyte count, age, and Lymphocyte-Monocyte Ratio (LMR).

Conclusion: Among the investigated models, Random Forest was proven as the most effective algorithm in predicting the occurrence of SAI in patients with acute hemorrhagic stroke. Five most significant variables in the prediction were LoS, BUN, leucocyte count, age, and LMR.

Keywords: Stroke-Associated Infections, Hemmorhagic Stroke, Machine Learning, Predictive Modelling, Prognosis

CORRELATION OF TNF-A LEVELS WITH CLINICAL SEVERITY AND DISABILITY IN ACUTE STROKE PATIENTS BASED ON NIHSS AND MRS SCORES

Ike Widyawati Fongiman , Muhammad Akbar

Background: Stroke is a major cause of death and disability, with its burden increasing in Indonesia. Inflammation, particularly involving TNF-α, plays a key role in stroke-related neuronal injury. Although its association with clinical outcomes has been studied, data from Indonesian populations remain limited.

Objective: This study analyzes the association between serum TNF-α levels and NIHSS and mRS scores in acute stroke patients to evaluate its prognostic value as a local inflammatory biomarker.

Methods: A cross-sectional study was conducted on 30 acute stroke patients. Serum TNF-α levels were measured within 72 hours using ELISA. Stroke severity and disability were assessed using NIHSS and mRS. Spearman correlation was used for statistical analysis.

Result: Among 30 stroke patients (70% male, mean age 59.9 years), mean NIHSS and mRS scores were 7.8 and 2.9, respectively. Mean TNF-α level was 5.27 pg/mL. TNF-α levels showed significant positive correlations with NIHSS (r = 0.493; p = 0.006) and mRS (r = 0.590; p < 0.001), indicating associations with greater stroke severity and disability.

Conclusion: Elevated serum TNF-α is moderately associated with stroke severity and disability, indicating its potential as a prognostic biomarker in acute stroke. Further larger studies are needed for validation.

Keywords: TNF-α, Clinical Severity, Disability, Acute Stroke, NIHSS, mRSRR01. Neuro-Vascular

DETERMINANTS OF INTRAVENOUS THROMBOLYSIS OUTCOMES IN ACUTE ISCHEMIC STROKE: A RETROSPECTIVE ANALYSIS IN A TERTIARY HOSPITAL

Rocksy FV Situmeang, Nadia Gabriella, Tasya Meidy Pradhana

Background: Identification of key variables affecting functional outcomes following intravenous thrombolysis (IVT) in acute ischemic stroke (AIS) is essential for optimizing treatment strategies.

Objectives: To evaluate determinants of functional outcomes following IVT in AIS, in order to identify variables associated with the most favorable response.

Methods: In this retrospective cohort study, we enrolled subjects with AIS who received IVT with recombinant tissue plasminogen activator (rtPA) at a dose of 0.9 mg/kg between January 2022-December 2024. Subjects who underwent mechanical thrombectomy were excluded. Collected data included demographic variables, admission blood pressure, random blood glucose, history of hypertension, type-II diabetes, dyslipidemia, previous AIS/TIA, and coronary artery disease (CAD), baseline stroke severity (NIHSS scores), onset-to-needle (OTN) and door-to-needle (DTN) times, and hemorrhagic transformation. The modified Rankin Scale (mRS) was evaluated 3 months post-admission, classifying functional outcomes as good (mRS≤2) or poor (mRS>2). Categorical and continuous variables were analyzed using Chi-square test and t-test, respectively. Multivariate logistic regression was employed to identify predictors of functional outcomes.

Results: This study included 75 subjects, with a median age of 61(42-81): 74.7% were male. At 3 months, 81.3% achieved good functional outcome, while 18.7% had poor functional outcome. Bivariate analysis demonstrated history of previous AIS/TIA, higher baseline stroke severity, prolonged DTN, and the presence of hemorrhagic transformation were significantly correlated with poor functional outcomes following IVT (p=0.001,p<0.001,p=0.014,p=0.010). Multivariate logistic regression analysis revealed higher baseline NIHSS (odds ratio [OR], 1.524; 95% confidence interval [CI], 1.194-1.945; p=0.001) and history of previous AIS/TIA (OR, 0.123; 95% CI, 0.017-0.881; p=0.037) were associated with poor functional outcome.

Conclusion: Although the use of IVT in AIS is associated with good functional outcome, several factors affect its success.

Keywords: intravenous thrombolysis, acute ischemic stroke, functional outcome, mRS

DIFFERENCES BETWEEN C-C MOTIF CHEMOKINE LIGAND 5 (CCL5/RANTES) LEVELS WITH LACUNAR STROKE SUBTYPE AND NON LACUNAR SUBTYPE STROKE IN ACUTE ISCHEMIC STROKE PATIENTS

Albert Satria, Andi Kurnia Bintang

Background: Stroke is a leading cause of disability worldwide and the second most common cause of death. Ischemic stroke accounts for 87% of all stroke cases. Several studies have shown that inflammation contributes to the risk of ischemic stroke. The chemokine CCL5 is associated with inflammatory responses in atherosclerotic plaques and acute ischemic stroke.

Objective: This study aims to assess whether there is a difference in serum CCL5 levels between acute ischemic stroke with lacunar and non-lacunar subtypes, and to evaluate the role of hypertension and diabetes mellitus risk factors in influencing the differences in CCL5 levels between the two subtypes.

Methods: This was a cross-sectional analytic study involving acute phase ischemic stroke patients admitted to Dr. Wahidin Sudirohusodo General Hospital Makassar from November 2024 to December 2024. A total of 52 patients met the inclusion criteria and did not meet the exclusion criteria. Serum CCL5 levels were measured using the sandwich ELISA method. Statistical analysis was performed to compare CCL5 levels between stroke subtypes based on CT scan findings (lacunar or non-lacunar). Further statistical analysis was conducted to determine whether there was an association between increased CCL5 levels and the presence of one or both risk factors (diabetes mellitus and hypertension), or the absence of both.

Results: CCL5 levels were significantly higher ($p < 0,05$) in the non-lacunar stroke subtype compared to the lacunar subtype. Analysis of the relationship between risk factors (diabetes mellitus, hypertension, both, or neither) and CCL5 levels in each stroke subtype showed no statistically significant differences ($p > 0,05$).

Conclusion: CCL5 levels were significantly higher in the non-lacunar stroke subtype, suggesting that CCL5 levels may have potential as a parameter to differentiate between non-lacunar and lacunar ischemic stroke subtypes.

Keywords: CCL5, Lacunar stroke, Non-lacunar stroke

MACHINE LEARNING ANALYSIS TO PREDICT STROKE-ASSOCIATED INFECTIONS IN ACUTE ISCHEMIC STROKE PATIENTS

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Background: Stroke associated infection (SAI) are common complications that have a serious impact on ischemic stroke patient. They can lead to increased morbidity, prolonged hospitalization, and higher mortality rates. Early prediction of SAI remains a challenge in clinical practice due to the involvement of multiple complex and interacting risk factors.

Objective: This study investigated the applicability of machine learning techniques to predict SAI in Ischemic Stroke patient. This study aims to explore important characteristics in predicting the occurrence of SAI in acute ischemic stroke patients using the available demographic, clinical, laboratory, as well as the clinical scoring variables.

Methods: We conducted a cross-sectional study using data from Stroke Registry of 1,185 ischemic stroke patients admitted to Dr. Sardjito Hospital Stroke Unit between January 2020 and December 2024. Machine learning models, including Random Forest, Logistic Regression, and XGBoost, were trained and validated using patient demographic, clinical, laboratory, and clinical scoring variables. Model effectiveness was assessed using precision, accuracy, sensitivity, specificity, and area under the curve (AUC)-receiver operating characteristic (ROC). The variables of importance in differentiating SAI and non-SAI using the most effective model were reported.

Results: Of all models, Random Forest showed the most balanced performance in sensitivity (85%), specificity (46%), precision (46%), and overall accuracy (46%). In addition, Random Forest had the highest AUC-ROC compared to the other models. Five most significant variables in differentiating SAI and non-SAI in ischemic stroke patients were National Institutes of Health Stroke Scale (NIHSS) score, malnutrition assessed by the Prognostic Nutritional Index (PNI), length of stay (LoS), age, and High Density Lipoprotein (HDL) level.

Conclusion: Random Forest was the most effective model in classifying SAI in ischemic stroke patients. The most significant variables were NIHSS, malnutrition as defined by PNI, LoS, age, and HDL level.

Keywords: Ischemic Stroke, Stroke Associated Infections, Machine Learning, Infection Risk Prediction

CLINICAL PROFILES OF ACUTE ISCHEMIC STROKE PATIENTS WITH STROKE-ASSOCIATED INFECTIONS IN DR. SARDJITO HOSPITAL YOGYAKARTA

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Background: Stroke-associated infections (SAI) are complications of acute ischemic stroke (AIS) that adversely affect the patient outcomes. Identifying the clinical profiles of AIS patients prone to developing SAIs may support early recognition and targeted interventions.

Objective: To compare the clinical profiles of AIS patients who developed SAIs during hospitalization and to identify clinical factors significantly associated with SAI.

Methods: A cross-sectional study was conducted using data from the Stroke Registry of Dr. Sardjito Hospital, Yogyakarta, between 2020 and 2024. Patients included had confirmed AIS with symptom onset <48 hours prior to admission. SAIs were defined as in-hospital diagnoses of pneumonia, urinary tract infection, or sepsis. Patients were grouped into SAI and non-SAI. Clinical parameters including age, sex, length of stay, body mass index (BMI), stroke recurrence, stroke severity (NIHSS), functional status (Barthel Index), comorbidities, and nutritional markers (albumin) were analysed.

Results: Of 1,185 eligible patients, 343 (29%) developed SAIs. Compared to non-SAI group, SAI group was significantly older (median age 65 vs 61 years; $p<0.001$), had a higher proportion of females (50% vs 42%; $p=0.022$), and experienced longer hospital stays (median 6 vs 5 days; $p<0.001$). They also had lower BMI (23.3 vs 23.9; $p<0.001$), more recurrent strokes (43% vs 34%; $p=0.004$), and higher rates of comorbid conditions including heart disease (42% vs 29%; $p<0.001$), pressure ulcers (13% vs 1.5%; $p<0.001$), and deep vein thrombosis (4.4% vs 0.7%; $p<0.001$). Stroke severity was greater in SAI group (median NIHSS 12 vs 4; $p<0.001$), with significantly lower functional independence (median BI score 20 vs 60; $p<0.001$) and poorer nutritional status (median albumin 3.69 vs 4.06 g/dL; $p<0.001$).

Conclusion: AIS patients who develop stroke-associated infections tend to present with distinct clinical profiles characterized by older age, female sex, recurrent stroke, greater stroke severity, higher comorbidity burden, and indicators of malnutrition.

Keywords: Acute ischemic stroke, stroke-associated infection, clinical profile

PROFILE OF STROKE PATIENTS AT ENDE GENERAL HOSPITAL FOR THE PERIOD OF JANUARY- DECEMBER 2024

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Background: Ende General Hospital is a referral center for advanced health services in Ende Regency, East Nusa Tenggara Province. In 2024,.Data shows that hemorage stroke occupies a percentage of 19.78%. Intracerebral Haemorrhage is the 4th (fourth) most common cause of death for emergency room outpatients.

Objective: The purpose of this study was to provide an overview of stroke patients at RSUD Ende.

Method: Descriptive study with cross-sectional design. Subjects were taken from medical records of Ende General Hospital which fulfilled study criteria. Statistical analysis was done with Statistical Package for the Social Sciences version 26.

Result: 375 subjects fulfilled study criteria (74.7% of patients neurology inpatients). The proportion was mostly female (n=193 ; 51.47%) with the most age range between 55-64 years (n =151; 40.27%). The most common chief complaint was hemiparesis (n=278; 74.13%). Most of them were diagnosed with cerebral infarction (n=291; 77.6%) on the right side (n=183; 48.8%). Global aphasia was found in 10 subjects (2.67%). The most common risk factor was hypertension n=297; 79.2%), followed by

diabetes mellitus (n=41; 10.93%), smoking (n=20; 5.33%), heart disease (n=9; 2.4%) and dyslipidemia (n=8; 2.13%). Most subjects were discharged in improved condition (n=315; 84%) with a median length of stay of 7 days Most subjects were discharged in an improved state (n=315; 84%). The majority of subjects continued to attend the outpatient unit after discharge (n=305; 81.33%).

Conclusion: At Ende General Hospital in East Nusa Tenggara, a higher incidence of stroke has been observed in the 55–64 age group, with women being more affected than men. The leading risk factor for stroke is hypertension, followed by smoking habits and heart disease. This study was the first to give profile of stroke patients in Ende regency. Further studies are encouraged with this study as the baseline.

Keywords: Ende, stroke, profile

PROFILE OF LACUNAR INFARCT PATIENT AT WAHIDIN SUDIROHUSODO HOSPITAL

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Background: The Trial of Org 10172 in Acute Stroke Treatment (TOAST) classifies ischemic stroke etiology into five categories, one of which is small-vessel occlusion. This subtype specifically refers to lacunar stroke, also known as lacunar infarction, characterized by small infarcts (<15 mm) located in subcortical areas such as the internal capsule, thalamus, or pons, resulting from occlusion of small perforating arteries. It accounts for approximately 25% of ischemic stroke cases globally.

Objective: To determine the clinical characteristics of patients with lacunar infarction at Wahidin Sudirohusodo General Hospital.

Methods: A retrospective observational study with a cross-sectional approach was conducted among inpatients diagnosed with ischemic stroke at Wahidin Sudirohusodo Hospital from January 2023 to July 2024. Data collected included age, sex, risk factors (hypertension, diabetes mellitus, dyslipidemia, heart disease, and renal failure), and the location of lacunar infarction based on non-contrast head MSCT results.

Results: Out of 933 total ischemic stroke patients, 84(9%) patients were identified with lacunar infarction. The most common age group was 50–70 years, 53 (63%) patients, with a slight female predominance 44 (52%) patients. The most frequent comorbid risk factors were hypertension with diabetes mellitus and hypertension with chronic heart failure, each present in 20 (23.80%) patients. Radiological findings most frequently revealed lacunar infarction located in the internal capsule in 16 (19.04%) patients.

Conclusion: Lacunar infarction, a manifestation of small-vessel occlusion, is most commonly found in patients aged 50 years and older, predominantly in those with hypertension combined with diabetes mellitus or chronic heart failure. The internal capsule is the most frequent lesion site, typically presenting with pure motor hemiparesis.

Keywords: Lacunar Infarction, CharacteristicRR01. Neuro-Vascular

OUTCOMES OF REVERSAL THERAPY WITH ANDEXANET ALFA AND FOUR-FACTOR PROTHROMBIN COMPLEX CONCENTRATE (4F-PCC) IN FACTOR XA (FXA) INHIBITOR–ASSOCIATED INTRACRANIAL HEMORRHAGE: A META-ANALYSIS OF APIXABAN AND RIVAROXABAN CASES

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Background: Intracranial Hemorrhage (ICH) is a severe complication of factor XA (FXA) inhibitors such as apixaban and rivaroxaban. Reversal agents, including Andexanet Alfa (AA) and Four-Factor Prothrombin Complex Concentrate (4F-PCC), are commonly employed, but their comparative efficacy and safety remain uncertain.

Objective: To compare the clinical outcomes of AA versus 4F-PCC in patients with FXA inhibitor-associated ICH through a systematic review and meta-analysis.

Methods: This study adhered to PRISMA and MOOSE guidelines. A comprehensive search of multiple databases through May 2025 identified randomized controlled trials and prospective cohort studies comparing AA and 4F-PCC in adult patients with apixaban- or rivaroxaban-associated ICH. Primary outcomes included effective hemostasis, 30-day mortality, and thromboembolic events. Risk ratios (RR) and standardized mean differences (SMD) were calculated using random-effects models with Review Manager 5.4.

Results: Nine studies were included. AA demonstrated significantly higher effective hemostasis than 4F-PCC (RR 1.21, 95% CI: 1.07–1.37; p = 0.003) with minimal heterogeneity (I^2 = 0%). No significant difference was found in 30-day mortality (RR 0.70, 95% CI: 0.32–1.54; p = 0.38), although heterogeneity was substantial (I^2 = 93%). Thromboembolic events were also comparable (RR 0.80, 95% CI: 0.56–1.14; p = 0.21) with low heterogeneity (I^2 = 0%). Funnel plots showed a low risk of publication bias for baseline variables, but some asymmetry was noted for clinical outcomes.

Conclusion: AA appears superior to 4F-PCC in achieving effective hemostasis in FXA inhibitor-associated ICH. High heterogeneity in mortality data and potential publication bias warrant cautious interpretation and further randomized studies.

Keywords: Andexanet alfa, apixaban, rivaroxaban, four-factor prothrombin complex concentrate, intracranial hemorrhage

META-ANALYSIS OF EFFECT OF MLC601/MLC901 ON MOTOR RECOVERY AFTER STROKE

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Background and Objective: Our recently published systematic-search-and-review identified eight registered treatments with level A or B-R evidence of improving neuro-recovery after a stroke (Lee TH et al, Front Neurol. 2024 Jan 31;15:1346177). In this study, we updated the meta-analysis of the effect on post-stroke motor recovery of MLC601/MLC901, one of the eight identified treatments.

Methods: We searched for randomized clinical trials evaluating MLC601/MLC901 in stroke patients. Outcome selected was motor recovery using any scale assessed at different time points post-stroke. Data extracted from the studies were meta-analyzed for standardized mean differences (SMD) and 95% confidence intervals (CI) using RevMan5®. Both fixed effect (FE) and random effect (RE) estimates were calculated.

Results: This review included 5 studies with overall low risk of bias but some clinical heterogeneity. Diagnostic Therapeutic Effects of Apoplexy scoring was used in 2 studies, Fugl-Meyer Motor Assessment in 2 studies, and NIHSS motor scores in 1 study. Calculated SMD and 95% CI were 0.28 [0.13, 0.43] (FE) and 0.34 [-0.12, 0.80] (RE) at 1 month (4 studies, N=795), 0.57 [0.27, 0.88] (FE) and 0.48 [-0.09, 1.04] (RE) at 2 months (2 studies, N=190), 0.13 [0.01, 0.24] (FE) and 0.35 [-0.26, 0.95] (RE) at 3 months (2 studies, N=1129), and 0.12 [0.03, 0.22] (FE) and 0.20 [0.00, 0.40] (RE) at the end of study (5 studies, N=1774).

Conclusion: There is indication that MLC601/MLC901 is effective as an add-on to standard treatment in improving motor recovery in patients with primarily nonacute stable stroke.

Keywords: Stroke, motor recovery, MLC 601/901, meta-analysis

COMPARISON OF SERUM TGF-β1 LEVELS BASED ON CORTICAL AND SUBCORTICAL LESION LOCALIZATION IN ISCHEMIC STROKE PATIENTS

Zulkifli, Ashari Bahar

Background: Transforming Growth Factor Beta 1 (TGF-β1) is a cytokine that plays a critical role in the inflammatory and neuroprotective processes following ischemic stroke. However, there is limited research exploring the differences in TGF-β1 levels based on the localization of cortical and subcortical lesions.

Objective: To compare serum TGF-β1 levels between patients with ischemic stroke having cortical and subcortical lesions.

Methods: This cross-sectional study involved 24 ischemic stroke patients, divided into two groups: cortical infarction (n=9) and subcortical infarction (n=15). Demographic data, stroke onset, and TGF-β1 levels were measured and analyzed using Mann-Whitney and independent t-tests.

Result: Serum TGF-β1 levels in the cortical infarction group (mean ± SD: 1098.53 ± 531.95 pg/mL) were significantly higher compared to the subcortical infarction group (209.30 ± 192.65 pg/mL) with a p-value of 0.001. No significant difference was found in stroke onset (p = 0.530), but there was a significant difference in age between the two groups (p = 0.000).

Conclusion: There is a significant difference in serum TGF-β1 levels between ischemic stroke patients with cortical and subcortical lesions, suggesting a potential differential role of TGF-β1 based on lesion localization. Further research is needed to clarify the underlying biological mechanisms of these findings.

Keywords: TGF-β1, ischemic stroke, cortical infarction, subcortical infarction, inflammatory biomarker

THE ROLE OF INFLAMMATORY BIOMARKERS VCAM-1 AND ICAM-1 IN THE SEVERITY AND FUNCTIONAL OUTCOME OF ACUTE ISCHEMIC STROKE

Haris Nur, Muhammad Akbar

Background: Ischemic stroke is a leading cause of death and disability worldwide, with inflammation playing a critical role in its progression. Vascular cell adhesion molecule-1 (VCAM-1) and intercellular adhesion molecule-1 (ICAM-1) are key mediators of leukocyte migration into ischemic brain tissue, exacerbating neurological damage. These biomarkers are upregulated by hypoxia and proinflammatory cytokines, making them potential indicators of stroke severity and outcomes.

Objective: This study aimed to investigate the relationship between VCAM-1 and ICAM-1 levels and the severity and functional outcomes of acute ischemic stroke, as measured by the National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS).

Method: An analytical observational study with a cross-sectional design was conducted on 25 acute ischemic stroke patients (onset 1–7 days) and 18 controls. VCAM-1 and ICAM-1 levels were measured using ELISA. Stroke severity (NIHSS) and disability (mRS) were assessed. Statistical analyses included Spearman's correlation and Mann-Whitney U tests.

Result: VCAM-1 and ICAM-1 levels were significantly higher in stroke patients than controls (p=0.001 and p=0.01, respectively). Both biomarkers showed positive correlations with NIHSS (VCAM-1: ρ=0.45, p=0.02; ICAM-1: ρ=0.38, p=0.04) and mRS (VCAM-1: ρ=0.52, p=0.008; ICAM-1: ρ=0.41, p=0.03). Higher levels were associated with severe stroke (NIHSS ≥ 5) and poor outcomes (mRS 3–6).

Conclusion: VCAM-1 and ICAM-1 levels are elevated in acute ischemic stroke and correlate with severity and poor functional outcomes. Targeting these biomarkers may improve stroke management, though further research with larger samples is needed for validation.

Keywords: VCAM-1, ICAM-1, ischemic stroke, inflammation, biomarkers, NIHSS, mRS

AUTONOMIC NERVOUS SYSTEM FUNCTION BASED ON HEART RATE VARIABILITY IN ACUTE ISCHEMIC STROKE PATIENTS

Mukhraeni, Muhammad Iqbal Basri

Background: Ischemic stroke is among the foremost causes of mortality and chronic disability worldwide. Stroke can induce motor and sensory abnormalities, as well as impact the autonomic nervous system (ANS), which regulates essential bodily activities like heart rate. Heart Rate Variability (HRV) is a non-invasive technique utilised to assess autonomic nervous system function.

Objective: The objective of this study is to characterise the autonomic nervous system's function in acute ischemic stroke patients using HRV parameters.
Methods: Twenty-two acute ischemic stroke patients were included in this descriptive observational study. The HRV parameters were analysed using the time domain (HR, SDNN, RMSSD), frequency domain (VLF, LF, HF, LF/HF ratio), and sympathetic (SNS) and parasympathetic (PNS) nervous system activity indices.

Results: The majority of respondents were between the ages of 47 and 60 (59,1%) and had a female kelamin (68%). The most common is found in the right hemisfer (54.5%). The heart rate ratio is 79.6 BPM. The respective mean SDNN and RMSSD are 38.1 ms and 36.8 ms. A LF/HF ratio of approximately 1.53 indicates a decline in sympathetic dominance. The ratio of the PNS index is -0.53, while the SNS index is 2.04, indicating a dominance of friendly activities.

Conclusion: The sympathetic nervous system is typically predominant in patients with acute ischemic stroke. In the acute phase of stroke, HRV monitoring can serve as a critical indicator for assessing autonomic function.

Keywords: Acute ischemic stroke, Autonomic nervous system, Autonomic dysfunction, Heart rate variability

ASSOCIATION OF NEUTROPHIL-TO-LYMPHOCYTE RATIO WITH EARLY NEUROLOGICAL DETEREORATION IN ACUTE ISCHEMIC STROKE

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Introduction: Acute inflammation following ischemic stroke can compromise the penumbra zone, aggravate neuronal damage, and increase the mortality and disability risk. The neutrophil-to-lymphocyte ratio (NLR) is a readily accessible marker that reflects the balance between inflammatory (neutrophil) and regulatory/protective (lymphocyte) responses. Some studies have demonstrated NLR as a predictor of poor outcomes in acute ischemic stroke, others have found conflicting results.

Aim: To determine whether NLR is associated with early neurological deterioration (END) in acute ischemic stroke patients.

Method: This case-control study included acute ischemic stroke patients in Dr. Sardjito Hospital during 2024, selected via consecutive sampling. Only patients with stroke onset within 72 hours were included. Peripheral blood NLR was calculated within 24 hours of admission. END was defined as an increase in the National Institutes of Health Stroke Scale (NIHSS) score of more than 2 points during hospitalization. Patients were categorized into END and non-END groups based on NIHSS score changes. The association between NLR and END was analyzed using Chi-square test.

Results: Among 118 eligible patients, 27 (23%) experienced END and 91 (77%) did not. Elevated NLR was observed in both groups. Statistical analysis showed no significant association between elevated NLR and END occurrence (OR:0.997, p=0.661).

Conclusion: This study found no significant association between NLR and END in acute ischemic stroke patients. Further research with a larger sample size and prospective design is recommended to confirm these findings.

Keywords: Neutrophil-to-Lymphocyte Ratio, Early Neurological Deterioration, Acute Ischemic Stroke

ANALYSIS OF SERUM AMP-ACTIVATED PROTEIN KINASE (AMPK) LEVELS AS AN INDICATOR OF COGNITIVE IMPAIRMENT IN ISCHEMIC STROKE

Ariandi, Ashari Bahar

Background: Cognitive impairment is a common complication in the acute phase of ischemic stroke and may influence long-term prognosis. AMP-activated protein kinase (AMPK) is a cellular energy sensor involved in neuronal adaptation to metabolic stress. Decreased AMPK activity is suspected to contribute to cognitive deficits in various neurological conditions, including stroke.

Objective: To assess the difference in serum AMPK levels between acute ischemic stroke patients with and without cognitive impairment.

Methods: This was a comparative analytic study involving 38 patients with acute ischemic stroke, comprising 18 patients with mild cognitive impairment and 20 without, based on MMSE scores. Serum AMPK levels were measured using ELISA, and data were analyzed using independent t-test.

Results: The mean serum AMPK level in the cognitive impairment group was 0.85 ng/mL, while in the non-cognitive impairment group it was 1.04 ng/mL. Statistical analysis showed a significant difference between groups with a *p*-value of 0.000 ($p < 0.05$).

Conclusion: There is a significant difference in serum AMPK levels between acute ischemic stroke patients with and without cognitive impairment. Lower AMPK levels in the cognitively impaired group support the potential of AMPK as a biological marker and therapeutic target in managing cognitive impairment in acute ischemic stroke.

Keywords: AMPK, ischemic stroke, cognitive impairment

QUANTITATIVE ELECTROENCEPHALOGRAPHY THETA ACTIVITY AND TRANS CRANIAL DOPPLER-DERIVED HEMODYNAMIC INDICES AS EARLY BIOMARKERS OF COGNITIVE IMPAIRMENT AFTER ISCHEMIC STROKE: A PILOT EXPLORATION

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Introduction: Post-stroke cognitive impairment (PSCI) remains a significant complication of ischemic stroke and is often undetected in its early stages. Identifying non-invasive neurophysiological and hemodynamic biomarkers may enable earlier intervention and improve prognosis. Quantitative electroencephalography (qEEG) and transcranial Doppler (TCD) ultrasonography have emerged as promising tools to detect brain dysfunction following ischemic stroke.

Aim: This study aims to explore the relationship between theta activity on qEEG and cerebral hemodynamic parameters measured via TCD with cognitive function in ischemic stroke patients.

Methods: This cross-sectional pilot study was conducted from January to April 2025, involving 17 ischemic stroke patients divided into two groups: those with cognitive impairment (n = 12) and those without (n = 5), as determined by the MoCA-INA score. Absolute theta power (left and right hemispheres) was recorded using qEEG. TCD was used to measure mean flow velocity (MFV) and pulsatility index (PI) of the middle cerebral arteries (MCA). Correlations were analyzed using Spearman's rho, and group differences were tested using the Mann-Whitney U test.

Results: Significant negative correlations were observed between MoCA scores and absolute theta power (left: r = –0.576, p = 0.017; right: r = –0.550, p = 0.024). The MFV of the left MCA showed a positive correlation with cognitive function (r = 0.524, p = 0.033), while the PI of the left MCA showed a negative correlation (r = –0.496, p = 0.044). Mann-Whitney U tests confirmed significant differences in these parameters between the cognitively impaired and unimpaired groups ($p < 0.05$).

Conclusion: Increased theta activity and altered cerebral hemodynamic parameters are associated with cognitive impairment in ischemic stroke survivors. These findings support the use of qEEG and TCD as early, non-invasive biomarkers for the detection of PSCI.

Keywords: quantitative EEG, theta activity, transcranial Doppler, cognitive impairment, ischemic stroke, cerebral hemodynamics, mean flow velocity, pulsatility index

STROKE SUBTYPES, MECHANISMS AND RISK FACTORS IN SOUTH-EAST ASIA

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Background: South-East Asia (SEA) is home to 675 million people living in 12 countries. Stroke is a major cause of death and disability globally, and a leading cause of chronic disease burden in SEA.

Objective: This study reviews recent published data on stroke subtypes, mechanisms and risk factors among hospitalised stroke patients in SEA.

Methods: A Pubmed search of hospital-based stroke registries was performed. The search terms 'stroke' AND ('Brunei OR Burma OR Myanmar OR Cambodia OR Indonesia OR Laos OR Leste OR Malaysia OR Papua OR Philippines OR Singapore OR Thailand OR Vietnam') were used. All available years were included, til 31 December 2024. The titles then s were reviewed, full papers were obtained where possible. Inclusion criteria were 1. Hospitalised patients were studied 2. All acute strokes included, or all ischaemic strokes (IS) subtyped by TOAST criteria. Data was extracted on stroke subtypes (IS, intracerebral haemorrhage ICH, subarachnoid haemorrhage SAH), mechanisms of IS (based on TOAST criteria), and stroke risk factors. Recent multi-centre studies were preferred over single-centre stuies.

Results: A total of 7099 papers were identified by the search terms. Among 8 countries, IS was the most frequent subtype (61.4-80%) except for Myanmar where HS was almost more frequent (49.2%) than IS. Among 4 countries, Small Artery Occlusion was the most common IS mechanism (37-42.3%), though Large Artery Atherosclerosis was the most frequent in Indonesia (59.6%). Hypertension was the most common stroke risk factor, highest in Indonesia (82.3%) and lowest in Thailand (53%). There was variability in the frequency of diabetes mellitus, hyperlipidaemia, smoking, previous stroke/TIA, atrial fibrillation, and ischaemic heart disease.

Conclusions: There are variations in characteristics among hospitalised stroke patients in SEA. Multi-centre studies are needed to corroborate these findings and investigate differences.

Keywords: stroke, subtypes, mechanisms, risk factors

POOR NUTRITIONAL-IMMUNOLOGICAL STATUS AS A MARKER OF STROKE-ASSOCIATED INFECTION IN HAEMORRHAGIC STROKE PATIENTS: INSIGHTS HALP SCORE

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Background: Stroke-associated infection (SAI) is a serious complication in patients with haemorrhagic stroke, often leads to increased length of stay, morbidity and mortality. Nutritional status has been identified as a potential modifiable risk factor influencing immune competence and vulnerability to infections. The Haemoglobin, Albumin, Lymphocyte and Platelet (HALP) score is an emerging objective indicator of nutritional and immunological status in clinical settings.

Objective: This study aims to evaluate the association of HALP score with the occurrence of SAI in haemorrhagic stroke patients.

Methods: A cross-sectional study was conducted at Dr. Sardjito Central General Hospital, Yogyakarta. The data were collected from the stroke registry of Sardjito Hospital from 2020-2024. Only patients with stroke onset less than 48 hours were included in the study. Patients diagnosed

with any focal or systemic infection on admission was excluded. Nutritional-immunological status was assessed upon admission using HALP score. The score were acquired by multiplying the level of haemoglobin, albumin, lymphocyte and platelet. The occurrence of urinary tract infection, pneumonia and sepsis during hospitalization was recorded as SAI.

Results: Among 446 participants, 204 (45.74%) developed SAI. Bivariate analysis showed a significant association between HALP scores (p = 0.006; OR = 1.16; 95% CI: 0.9 – 1.5) with the occurrence of SAI. Those who developed SAI has a significantly lower HALP score (Median HALP 1.87 in SAI vs 2.22 in non-SAI, p<0.05).

Conclusion: The findings indicate that lower HALP scores are significantly associated with SAI occurrence in patients with haemorrhagic stroke, highlighting the HALP score as a potentially valuable predictor of SAI. This result suggests that incorporating HALP score assessment into routine clinical evaluation may aid in early identification of patients at higher risk for SAI.

Keywords: HALP score, Nutritional-immunological status, Stroke-associated infection, hemorrhagic stroke

GLUCOSE-TO-POTASSIUM RATIO AS A MARKER OF STROKE-ASSOCIATED INFECTION IN HEMORRHAGIC STROKE PATIENTS

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Background: Stroke-associated infection (SAI) is a frequent and serious complication in patients with hemorrhagic stroke, contributing to increased morbidity and mortality. Early prediction of SAI is essential to guide preventive strategies and improve outcomes. The glucose-to-potassium (Glu/K) ratio has emerged as a potential biomarker reflecting stress response and metabolic disturbance in critically ill patients.

Objective: This study aims to evaluate the association between the Glu/K ratio and the incidence of SAI in patients with hemorrhagic stroke.

Methods: A cross-sectional study was conducted using data from the Stroke Registry of Dr. Sardjito Hospital between 2020-2024. All patients included in the study had < 48 hours onset of stroke with no infection co-morbidities on admission. Serum glucose and potassium levels were measured within 24 hours of admission. The Glu/K ratio was calculated and analyzed in relation to the occurrence of SAI (urinary tract infection, pneumonia, and/or sepsis), defined according to standard diagnostic criteria.

Results: Among 446 patients, 204 (45%) developed SAI. The overall median Glu/K ratio was 34 of all groups, with median Glu/K ratio in SAI group was significantly higher compared to non-SAI group (37 vs 32, p<0.05). This result indicates a significant association between elevated Glu/K ratio and the occurrence of SAI in hemorrhagic patients.

Conclusion: A higher glucose-to-potassium ratio on admission is significantly associated with the development of SAI in hemorrhagic stroke patients. This result suggests that stress and metabolic disturbance may play a role in the development of infection in stroke patients.

Keywords: Glucose-to-potassium ratio, hemorrhagic stroke, stroke-associated infection

THE ASSOCIATIONS OF INFLAMMATORY MARKERS AND STROKE-ASSOCIATED INFECTIONS IN ACUTE ISCHEMIC STROKE PATIENTS

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Background: Acute ischemic stroke initiates a cascade of neuroinflammatory processes that not only contribute to secondary brain injury but also affect systemic immune function. This dysregulated immune response can predispose patients to stroke-associated infections (SAI), which are among the most serious complications during the acute phase. Identifying reliable inflammatory biomarkers may help predict the development of SAI.

Objective: This study aims to evaluate the associations of composite inflammatory markers—the Systemic Immune-Inflammation Index (SII) and the Aggregate Index of Systemic Inflammation (AISI)—for the occurrence of SAI in patients with acute ischemic stroke.

Methods: This is a cross-sectional study using the data from the Stroke Registry of Dr. Sardjito General Hospital, Yogyakarta between the period of January 2020 – December 2024, with acute stroke onset of less than 48 hours as the primary inclusion criteria. SII was calculated (Platelet Count × Neutrophil Count) / Lymphocyte Count, and AISI was calculated using the formula (Neutrophil Count × Platelet Count × Monocyte Count) / Lymphocyte Count. All laboratory data calculated were obtained within 12 hours of patient's admission. Patients with known focal or systemic infection diagnosis on admission were excluded from the study.

Results: Of 1,185 included subjects, 343 developed SAI. In the SAI group, the median SII was significantly higher than in the Non-SAI group (1,418 vs. 956; p < 0.001). A similar pattern was observed for AISI. The median AISI in the SAI group was significantly higher compared to Non-SAI (796 vs 485, p < 0.001). These findings suggest that elevated levels of SII and AISI are associated with an SAI occurence.

Conclusion: This study confirmed that the SII dan AISI, that were calculated on admission, are associated with SAI occurence in acute ischemic stroke patients during hospitalization.

Keywords: Non-Hemorrhagic Stroke, Stroke-Associated Infections, Systemic Immune-Inflammation Index, Aggregate Index of Systemic Inflammation

THE ASSOCIATIONS OF INFLAMMATORY MARKERS AND THE OCCURRENCE OF STROKE-ASSOCIATED INFECTIONS IN HAEMORRHAGIC STROKE

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Background: Hemorrhagic stroke triggers an acute inflammatory response within the brain that contributes to secondary injury and worsened neurological outcomes. This inflammatory cascade can also lead to systemic immune dysregulation, increasing vulnerability to stroke-associated infections (SAI). Given the clinical burden of SAI, identifying predictive inflammatory biomarkers could be crucial for early detection and improved management in hemorrhagic stroke patients.

Objective: This study aims to assess the predictive value of the Systemic Immune-Inflammation Index (SII) and the Aggregate Index of Systemic Inflammation (AISI) in relation to stroke-associated infections in patients with hemorrhagic stroke.

Methods: This cross-sectional study utilized data from the Stroke Registry of Dr. Sardjito General Hospital, Yogyakarta. The primary inclusion criterion was hemorrhagic stroke with symptom onset within 48 hours. SII was calculated using the formula: (platelet count × neutrophil count) / lymphocyte count, and AISI was calculated using the formula: (neutrophil count × monocyte count × platelet count) / lymphocyte count. All laboratory parameters used in these calculations were obtained within the first 12 hours of hospital admission. SAI was defined as the occurrence of one or more of the following during hospitalization: urinary tract infection, pneumonia, or sepsis.

Results: We included 446 patients with haemorrhagic stroke. Of these, SAI occurred to 204 patients (45%). The median SII in patient who developed SAI was 2,278 (IQR: 1,236–3,627) which was significantly higher compared to those who did not developed SAI (Median 1,790; IQR: 975–3,018, $p = 0.006$). The median AISI in patients who developed SAI was 1,300 (IQR: 587–2,859), which was higher compared to those who did not develop SAI (Median 987; IQR: 427–2,167, $p = 0.020$).

Conclusion: Higher values of SII and AISI were significantly associated with the occurrence of stroke-associated infections in patients with haemorrhagic stroke during hospitalization.

Keywords: Systemic Immune-Inflammation Index, Aggregate Index of Systemic Inflammation, Stroke-associated Infections

NON-TRADITIONAL LIPID INDICES AS BIOMARKERS FOR STROKE-ASSOCIATED INFECTION IN ACUTE ISCHEMIC STROKE PATIENT

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Background: Stroke-Associated Infection (SAI) affects up to 30% of Acute Ischemic Stroke (AIS) patients, contributing to worse clinical outcomes. Early risk identification is crucial for preventive and therapeutic strategies. While lipid metabolism affects immune responses and inflammation, its predictive role in SAI remains unclear. Non-traditional lipid biomarkers – including atherogenic coefficient (AC), total cholesterol to HDL ratio (TC/HDL), triglyceride to HDL ratio (TG/HDL), and atherogenic index of plasma (AIP) – may provide insight into post-stroke infection risk.

Objectives: To assess the association between AC, TC/HDL, TG/HDL, AIP and the development of SAI in AIS patients.

Methods: A cross-sectional study was conducted at Dr. Sardjito General Hospital, Yogyakarta, using Stroke Registry data between January 2020 and December 2024. Only patients with stroke onset less than 48 hours were included in the study. Patients diagnosed with any focal or systemic infection on admission was excluded. Lipid profiles were examined within 24 hours of patient's admission to calculate AC, TC/HDL, TG/HDL, and AIP. SAI was identified based on clinical and laboratory criteria during hospitalization, including the diagnosis of urinary tract infection, hospital-acquired pneumonia, and sepsis. The association between each lipid index and the presence of SAI was analyzed.

Results: Of 1,185 AIS patients, 343 (29%) developed SAI. Median values of AC 3.53 (2.52, 5.02), TC/HDL 4.54 (3.52, 6.03), TG/HDL 3.4 (2.1, 5.8), and AIP 0.53 (0.32, 0.75) in the SAI group were significantly higher compared to those in the non-SAI group: AC 3.23 (1.94, 4.55), TC/HDL 4.24 (2.94, 5.56), TG/HDL 2.8 (1.6, 4.5), and AIP 0.45 (0.21, 0.65) (all $p < 0.001$).

Conclusion: Non-traditional lipid biomarkers – AC, TC/HDL, TG/HDL, and AIP – were significantly associated with the development of SAI in AIS patients. These non-traditional lipid indices may serve as potential biomarkers for early identification of high-risk patients and guide targeted preventive and therapeutic strategies.

Keywords: Non-traditional lipid biomarkers, stroke-associated infection, ischemic stroke

THE GLUCOSE-TO-POTASSIUM RATIO: A SIMPLE BIOMARKER OF STROKE-ASSOCIATED INFECTIONS IN ACUTE ISCHEMIC STROKE PATIENTS

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Background: Stroke is not only a vascular event, it often marks the beginning of serious complications, including stroke-associated infections (SAI). SAIs can prolong hospital stays, worsen recovery, and increase mortality. Despite the availability of advanced diagnostics, simpler indicators may exist. One such marker is the glucose-to-potassium ratio (GPR), a routinely available parameter that may reflect systemic stress and metabolic disturbance.

Objective: This study aimed to determine whether GPR can be independently associated with SAI occurrence in patients with acute ischemic stroke.

Methods: A cross-sectional study was conducted at Dr. Sardjito Central General Hospital, Yogyakarta, using data Stroke Registry of patients who were admitted between 2020 and 2024. Patients were included if admitted within 48 hours of stroke onset. They were categorized into two groups: SAI, with the occurrence of urinary tract infection, pneumonia, and sepsis during hospitalization, and non-SAI. GPR was calculated using laboratory parameters that were obtained within 24 hours of admission. Demographic, clinical, and laboratory data were compared.

Results: Of 1152 patients, 332 developed SAI. SAI patients were significantly older (median age 65 vs. 61) and had higher NIHSS scores, lower Barthel Index, and longer hospital stays. GPR was significantly higher in the SAI group (median 34.0 vs. 32.1; p=0.048). In multivariate analysis, GPR remained an independent predictor of SAI (p=0.039; OR=1.008; 95% CI: 1.000–1.016).

Conclusion: GPR is a low-cost, easily accessible biomarker that may help predict SAI, particularly in the early phase of care. Higher GPR levels are associated with SAI occurrence, reflecting increased stress and metabolic disturbance.

Keywords: Glucose-to-potassium ratio, Stroke-associated infection, acute ischemic stroke, biomarker

COGNITION IN MOTION: THE EFFECTIVENESS OF EXERCISE AND TECHNOLOGY-ASSISTED REHABILITATION FOR COGNITIVE FUNCTION POST-STROKE — A META-ANALYSIS

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Background: Cognitive impairment affects up to 80% of stroke survivors, limiting independence and long-term recovery. Exercise-based and technology-assisted interventions have gained attention in cognitive rehabilitation, yet evidence regarding their effectiveness remains varied. Most previous studies assessed only global cognition without examining specific domains such as attention, processing speed, and working memory. Moreover, no comprehensive meta-analysis has directly compared intervention outcomes across cognitive parameters.

Objective: To evaluate the effectiveness of exercise-based and technology-assisted interventions on cognitive functions in post-stroke individuals.

Methods: A systematic review and meta-analysis were conducted on randomized controlled trials (RCTs) using PubMed, Scopus, Google Scholar, and Cochrane, focusing on studies from 2015-2024 that fulfilled the PRISMA guidelines, and were assessed by the RoB-2 tool. The intervention group was treated with several physical exercise or digital cognitive interventions. The control group was treated with standard rehabilitations. The outcomes analyzed included the Montreal Cognitive Assessment (MoCA), Trail Making Test A (TMT-A), Trail Making Test B (TMT-B), Forward Digit Span (FDS), and Backward Digit Span (BDS). The mean value in each score was counted between post- and pre-intervention.

Results: A total 13 studies, involving 286 intervention and 288 control participants were included. The differences of mean value between intervention and control group in each score were presented as mean difference (MD). This study shows physical exercise and digital cognitive interventions could improve cognitive function in several cognitive tests: MoCA (MD= 3.28, I^2=96%, p<0.01) and TMT-B (MD= -10.89, I^2=98%, p<0.001). In contrast, there was no significant difference assessed with TMT-A, FDS, and BDS.

Conclusion: Exercise-based and technology-assisted interventions are effective in improving global cognition and executive function among stroke survivors. However, their limited impact on attention and working memory highlights the need for more targeted and domain-specific rehabilitation strategies.

Keywords: Stroke, Cognitive Rehabilitation, Exercise, Digital Technology, Cognitive Function

ELECTROLYTE PROFILE OF SODIUM, POTASSIUM, AND CHLORIDE IN PATIENTS WITH ACUTE STROKE ISCHEMIC AND HEMORRHAGIC AT WAHIDIN SUDIROHUSODO HOSPITAL

Jeili Angle Worang, Muhammad Akbar

Background: Stroke is a medical emergency and considered the 2nd leading cause of mortality worldwide. Its high morbidity and mortality are often due to complications such as cerebral edema, infections, and cardiovascular comorbidities. Acute stroke may also induce electrolyte

imbalances, which are independent predictors of poor outcomes. Hyponatremia, hypernatremia, and hypokalemia are the commonest types of electrolyte disturbances.

Objective: To describe serum sodium, potassium, and chloride levels in acute stroke patients based on stroke type and to evaluate whether comorbidities such as hypertension and diabetes mellitus contribute to electrolyte disturbances.

Methods: This study is a retrospective descriptive using medical record file data. The study population was patients with acute stroke ischemic or hemorrhagic confirmed by head CT or MRI findings at Wahidin Sudirohusodo General Hospital from Januari - February 2025. Serum electrolytes were measured within 24–48 hours post-onset. Patients with chronic kidney disease or incomplete records were excluded.

Results: A total of 55 acute stroke patients were included, comprising 33 males (60%) and 22 females (40%), with the highest age distribution > 60 years (43.6%). Ischemic stroke accounted for 63.6% of cases, and hemorrhagic stroke for 36.4%. In ischemic stroke, hyponatremia was found in 54.3%, hypokalemia in 17.1%, and hypochloremia in 17.1%. In hemorrhagic stroke, hyponatremia and hypokalemia were present in 50% and 45%, respectively; hypochloremia in 10%. Hypertension was the most frequent comorbidity, followed by diabetes mellitus.

Conclusion: Incidence of Hyponatremia was more common than hypokalemia in patients with acute stroke. Hyponatremia and hypokalemia was comparatively more common in brain infraction than spontaneous intracerebral hemorrhage. Hypertension was the most frequent comorbidity, followed by diabetes mellitus of this study.

Keywords: Acute stroke, Ischemic stroke, Hemorrhagic stroke, Hyponatremia, Hypokalemia

GENETICALLY PROXIED C-REACTIVE PROTEIN AND RISK OF UNRUPTURED INTRACRANIAL ANEURYSM IN EAST ASIAN POPULATIONS: A MENDELIAN RANDOMIZATION STUDY USING INFLAMMATION-RELATED LOCI

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Background: C-reactive protein (CRP), an inflammatory marker encoded on chromosome 1q23.2, is associated with various vascular diseases including unruptured intracranial aneurysm (UIA). Although observational studies suggest a link between CRP and UIA, the genetic causal relationship in East Asian populations remains uncertain.

Objective: This study uses Mendelian Randomization(MR) to assess whether genetically elevated CRP levels influence UIA risk.

Methods: Nine independent CRP-associated single nucleotide polymorphisms(SNPs) were selected as instrumental variables ($p<5\times10^{-8}$, $r^2<0.01$) from large-scale East Asian CRP Genome-Wide Association Studies (GWAS). These SNPs map to inflammation-related genes, including CRP(rs3093059), IL6R(rs4845623), HNF1A(rs7979478), NECTIN2(rs395908), and LOC401312(rs17301724). Summary-level outcome data were derived from a meta-GWAS on UIA in East Asian cohorts. The primary causal estimate was obtained using inverse-variance weighted(IVW) analysis under a multiplicative random-effects model. Robustness was assessed via MR-Egger, weighted median, simple mode, and weighted mode methods. Diagnostic evaluations included Cochran's Q for heterogeneity, MR-Egger intercept and MR-PRESSO for pleiotropy, and leave-one-out analyses for influential variants.

Result: IVW analysis demonstrated a positive association between genetically proxied CRP levels and UIA risk (β=0.982, standard error[SE]=0.936), with consistent directional estimates across all models: MR-Egger(β=1.069, SE=2.125), weighted median(β=0.942, SE=1.168), simple mode (β=0.347, SE=1.857), and weighted mode (β=0.522, SE=1.425). While none of the methods achieved statistical significance (all p>0.29), the concordant positive direction across five MR estimators suggests a potentially modest causal effect. Heterogeneity was low (Cochran's Q=3.25, p=0.918), and pleiotropy was negligible (MR-Egger intercept= -0.0057, p=0.965; MR-PRESSO global p=0.905). No influential outliers were detected in leave-one-out sensitivity analysis, where per-SNP estimates ranged from β= 0.51 to 1.43. Funnel plot symmetry supported instrument validity.

Conclusion: This MR study indicates a potential causal link between elevated CRP and UIA risk in East Asians, with consistent effects across loci like IL6R, HNF1A, and CRP supporting inflammation's role in pathogenesis.

Keywords: C-reactive protein, intracranial aneurysm, mendelian randomization, east Asians, inflammation

THE ASSOCIATION OF MALNUTRITION AND STROKE ASSOCIATED INFECTION (SAI) IN ACUTE ISCHEMIC STROKE PATIENTS

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Background: Stroke-associated infections (SAI) are serious complications in patients with acute ischemic stroke, contributing to increased mortality, prolonged hospitalization, and poor functional outcomes. Malnutrition, often underrecognized in the acute setting, can impair immune responses and further predispose patients to infection. The Prognostic Nutritional Index (PNI), a tool derived from serum albumin levels and lymphocyte count, may serve as a useful predictor of infection risk in this population.

Objective: This study aims to investigate the association between nutritional status, as assessed by PNI, and the occurrence of SAI in patients with acute ischemic stroke.

Methods: This cross-sectional study utilized data from the Stroke Unit Registry of Dr. Sardjito General Hospital between 2020 and 2024. Eligible participants were patients diagnosed with acute ischemic stroke, admitted within 48 hours of symptom onset. Nutritional status was assessed upon admission using PNI, and patients were stratified according to malnutrition risk levels. SAI was defined as the occurrence of one or more of the following during hospitalization: urinary tract infection, pneumonia, or sepsis.

Result: A statistically significant association was found between PNI scores and the incidence of SAI. Patients who developed SAI had notably lower PNI scores compared to those without SAI (Median PNI: 38 vs. 42, $p < 0.001$). Furthermore, the distribution of malnutrition severity differed significantly between groups, with a higher proportion of patients categorized as moderate to severe malnutrition in the SAI group ($p < 0.01$).

Conclusion: Our findings suggest that lower PNI scores, indicating poorer nutritional status, are significantly associated with a higher risk of developing stroke-associated infections in patients with acute ischemic stroke. Early nutritional assessment using PNI may serve as a valuable tool to identify high-risk patients and guide timely nutritional interventions to reduce infection-related complications and improve clinical outcomes.

Keywords: Ischemic stroke, Stroke-associated infection, Prognostic Nutritional Index, Malnutrition

WHITE BLOOD CELL COUNT LEVELS AT ADMISSION TO PREDICT IN-HOSPITAL MORTALITY OF INTRACRANIAL HEMORRHAGE PATIENT IN DR. WAHIDIN SUDIROHUSODO HOSPITAL MAKASSAR

Nilvany Dwiyanti, Andi Kurnia Bintang

Background: Hemorrhagic stroke is characterized by accumulation of blood around the brain parenchyma and in the ventricular system. It is brought on by an intracerebral hemorrhage that happens when cerebral blood vessels rupture. The size and location of hematoma, as well as the patient's Glasgow Coma Scale (GCS) at admission, can be used to predict mortality in cases of acute intracerebral hemorrhage (ICH), which can be a catastrophic event. One method for predicting patient mortality is the

ICH score. A higher ICH score indicates a higher risk of death within 30 days. Inflammatory pathways have been shown in numerous investigations to have a role in the development of ICH-induced brain damage. According to the literature, patients with an elevated white blood cell (WBC) count have worse clinical manifestations and prognosis than patients without an elevated WBC count. This study aims to analyze the relationship between WBC levels upon admission and ICH scores with patient mortality due to ICH.

Method: This is an observational, analytical, cross-sectional study using WBC levels, ICH scores, and patient mortality data from ICH patients admitted to Dr. Wahidin Sudirohusodo Hospital in 2024.

Results: Total 85 patients with intracranial hemorrhage were analyzed. Twenty-three patients (27.1%) died during hospitalization, 62 patients (72.9%) were discharged after treatment. Data analysis revealed a significant correlation between ICH scores and patient mortality during hospitalization (p = 0.000). However, WBC levels were not significantly associated with patient mortality (p = 0.369). Similarly, analyzing the relationship between ICH scores, WBC, and patient mortality during hospitalization did not reveal a significant association in predicting ICH patient mortality.

Conclusion: This study concluded that the ICH score alone still superior to the combination of the ICH score and the patient's initial white blood cell (WBC) count for predicting mortality prognosis in patients with intracranial hemorrhage.

Keywords: Intracranial hemorrhage (ICH), ICH score, white blood cell count (WBC)

NEUTROPHIL-TO-LYMPHOCYTE RATIO AS A BIOMARKER FOR STROKE-ASSOCIATED INFECTIONS IN ACUTE HEMORRHAGIC STROKE

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Introduction: Stroke-associated infections (SAIs) are common complications in patients with acute hemorrhagic stroke, significantly affecting morbidity, mortality, and recovery. Inflammation and immune dysregulations play key roles in developing infections such as pneumonia, urinary tract infections, and sepsis. The neutrophil-to-lymphocyte ratio (NLR) has emerged as a potential predictive biomarker for these infections.

Objective: This study aims to evaluate the role of NLR as a biomarker for SAI in patients with acute hemorrhagic stroke at Dr. Sardjito General Hospital.

Methods: A cohort retrospective study was conducted using data from the Stroke Registry of Dr. Sardjito Hospital, Yogyakarta, between January 2020 and December 2024. NLR was measured upon admission, and SAI occurrences (pneumonia, urinary tract infections, and sepsis) were monitored during hospitalization. The risk of SAI in patient with elevated NLR was measuring prevalence ratio (PR). A Receiver Operating Characteristic (ROC) curve was plotted to identify the optimal NLR threshold for predicting infections.

Results: Of 446 subjects, 204 (45,7%) patients developed SAI. The median NLR value for the overall group was 8 (4-14). In non-SAI group, the median NLR was 7 (4-11), while in SAI group had a median NLR of 9 (5-15). The difference in NLR between the groups was statistically significant (p-value of <0.001), indicating a strong association between NLR levels and SAI occurrence. Bivariate analysis confirmed elevated NLR with the risk of SAI occurrence with RR = 2.137 (95% CI 1.421 – 3.216). The ROC curve identified an optimal NLR threshold of 11.6 for predicting infections with 40% sensitivity and 77% specificity.

Conclusions: NLR is a significant and cost-effective biomarker for predicting SAIs in acute hemorrhagic stroke patients. Monitoring NLR can identify high-risk patients for early intervention and better infection management. Further studies with larger samples are needed to validate these findings.

Keywords: Neutrophil-to-lymphocyte ratio, Stroke-associated infections, Hemorrhagic stroke, Biomarker

PROFILE OF OUTPATIENTS AT THE NEUROLOGY CLINIC OF BORONG REGIONAL GENERAL HOSPITAL

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Background: Understanding the demographic and diagnostic profiles of patients in outpatient neurology services is essential for planning effective healthcare delivery, especially in newly developed regions.

Objective: This study aimed to evaluate the distribution of neurological disorders and associated patient characteristics in a neurology outpatient clinic during its initial six months of operation in Borong, a newly autonomous regency in Indonesia.

Methods: A descriptive analysis was conducted using data from the medical records of Borong Regional General Hospital between July and December 2024. Sociodemographic variables and diagnoses coded according to the International Classification of Diseases, 10th Revision (ICD-10), were analyzed. Descriptive statistics were used to summarize patient characteristics and diagnosis distribution.

Results: A total of 274 patient visits were recorded. The mean age was 53 ± 14.3 years, with males comprising 59.9% (n = 164). The three most common diagnoses were non-hemorrhagic stroke (NHS, 34.3%), low back pain (LBP, 26.3%), and epilepsy (13.5%). These conditions were more frequently observed in male patients—64.9% for NHS, 55.6% for LBP, and 73% for epilepsy. NHS was most prevalent among individuals aged 51–60 years, LBP among those aged ≥61 years, and epilepsy among patients aged 21–30 years. Farmers were the most common occupation among NHS patients (30.9%), while housewives predominated among those with LBP (33%).

Conclusions: The high prevalence of stroke, back pain, and epilepsy, particularly among older males, underscores the need to align neurology services with the specific demographic and occupational characteristics of populations in new administrative regions in Indonesia, such as Borong.

Keywords: demographic characteristics, outpatient, neurology clinic, neurological disorder

PHARMACOLOGICAL THERAPIES FOR PREVENTION OF DELAYED CEREBRAL ISCHEMIA POST ANEURYSMAL SUBARACHNOID HEMORRHAGE IN ASIAN POPULATIONS: A NETWORK META-ANALYSIS

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Background: Aneurysmal subarachnoid hemorrhage (aSAH) is a life-threatening condition with a high risk of delayed cerebral ischemia (DCI), especially

in Asian populations with distinct epidemiological characteristics. The comparative effectiveness of pharmacological strategies for DCI prevention remains unclear.

Objective: To evaluate and rank the effectiveness of pharmacological treatments in preventing DCI after aSAH in Asian patients.

Methods: This review followed PRISMA 2020 guidelines, using PubMed, ProQuest, and Lancet databases. We performed a Bayesian network meta-analysis with a random-effects model on randomized controlled trials (RCTs) of prophylactic drugs for DCI after aSAH in Asian patients after coiling or clipping surgery. Dichotomous outcomes were analyzed using risk ratios (RR) with 95% credible intervals (95% CrI), and surface under the cumulative ranking (SUCRA) values estimated the ranking probability, with meta-regression assessing the impact of mean patient age.

Results: 18 RCTs involving 2.736 Asian patients (mean age of 56.6 years old) were included. The analysis incorporated 10 interventions, resulting

in 45 possible pairwise comparisons. Among all regimens, only the combination of cilostazol and fasudil hydrochloride (FH) showed statistically significant superiority over other treatments, notably outperforming FH monotherapy (RR 0.43, 95%CrI 0.24, 0.75), nimodipine monotherapy (RR 0.34, 95%CrI 0.13, 0.94), and placebo (RR 0.3, 95%CrI 0.09, 0.96). According to the SUCRA, cilostazol and FH combination has the highest likelihood of being the best treatment (SUCRA 82.53%), followed by omega-3 fatty acid and FH combination (SUCRA 79.85%), statin and FH combination (SUCRA 65.82%), statin and nimodipine combination (SUCRA 55.22%). Network meta-regression revealed that age was an insignificant confounding factor.

Conclusion: Cilostazol with FH combination were most effective for preventing DCI in Asian patients with aSAH. These findings may assist clinicians in making informed decisions about prophylactic strategies, though further research is needed to clarify dose-specific effects for these regimens.

Keywords: Aneurysmal subarachnoid hemorrhage, Delayed cerebral ischemia, Drug therapies, Network meta-analysis

EFFECT ELECTROACUPUNCTURE COMPARING WITH MANUAL ACUPUNCTURE ON MOTOR RECOVERY AND DAILY LIFE ACTIVITIES ISCHEMIC STROKE PATIENT: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background: Ischemic stroke often leads to persistent motor deficits and impaired ability to perform activities of daily living (ADL), significantly reducing quality of life. Acupuncture is commonly used in post-stroke rehabilitation, with both electroacupuncture (EA) and manual acupuncture (MA) frequently applied. However, their comparative efficacy remains unclear.

Objective: To compare the effectiveness of electroacupuncture versus manual acupuncture for improving motor recovery and ADL in patients with ischemic stroke.

Methods: A systematic review and meta-analysis were conducted following PRISMA guidelines. Randomized controlled trials (RCTs) comparing EA and MA in adult ischemic stroke patients were identified from six databases through May 2025. Outcomes included motor function assessed by the Fugl-Meyer Assessment (FMA) and ADL measured by the Barthel Index (BI) or Modified Barthel Index (MBI). The methodological quality of the included trials were assessed using the Cochrane risk of bias assessment tool. Pooled effect sizes were calculated using weighted mean difference (WMD) or standardized mean difference (SMD) with fixed or random-effects models.

Results: Eighteen RCTs involving 1,267 participants were included. EA showed significantly greater improvements than MA in total FMA scores (WMD 7.47; 95% CI: 4.30–10.65; $p < 0.001$), upper extremity FMA (WMD 6.99; 95% CI: 5.09–8.89; $p < 0.001$), lower extremity FMA (WMD 4.74; 95% CI: 1.33–8.15 ; $p = 0.006$), and ADL (SMD 0.76; 95% CI: 0.43–1.09; $p < 0.001$). However, heterogeneity was substantial for most outcomes and the funnel plot indicated some asymmetry for a few outcomes.

Conclusions: Electroacupuncture offer superior benefits over manual acupuncture in enhancing motor function and ADL in patients with ischemic stroke. High heterogeneity and sign of potential publication bias suggest the need for further high-quality, large-scale trials to confirm these results.

Keywords: Electroacupuncture, Manual Acupuncture, Ischemic Stroke, Motor Recovery, Activities of Daily Living

FEATURES OF EXECUTIVE FUNCTION IN POST STROKE PATIENT AT NEUROLOGY OUTPATIENT CLINIC OF AMALIA BONTANG HOSPITAL ON JANUARY-FEBRUARY 2025

Fatmawati, Muhammad Akbar

Background: Executive dysfunction is a common cognitive deficit following stroke, which significantly impacts a patient's independence and quality of life. Early identification and evaluation of executive function are essential for planning rehabilitation strategies. The Mini Mental State Examination (MMSE) and Clock Drawing Test (CDT) are widely used tools to assess general cognition and executive function, respectively.

Objective: To describe the executive function profile of post-stroke patients using MMSE and CDT, and to evaluate the correlation between the two instruments.

Methods: This study was a descriptive analysis method with a cross-sectional design. Data were collected from 37 post-stroke patients at the neurology outpatient clinic of Amalia Bontang Hospital during January–February 2025. Executive function was assessed using the Clock Drawing Test (CDT), while global cognitive function was measured with the Mini-Mental State Examination (MMSE). Descriptive statistics were used to summarize the distribution of demographic and clinical characteristics. Correlation analysis were performed to examine associations between cognitive measures.

Results: Among the 37 patients, 86.5% exhibited executive dysfunction based on CDT scores. Most patients with impaired executive function were aged 56–65 years (51.4%), female (51.4%), and had a low level of education (≤9 years) (43.2%). Lesions were located in the left cerebral hemisphere (43.2%), right cerebral hemisphere (35.1%) and cerebellum (8.1%). MMSE results indicated mild cognitive impairment in 45.9% of patients. A strong positive correlation was found between MMSE and CDT scores ($r = 0.752$, $p < 0.001$).

Conclusion: The majority of post-stroke patients demonstrated executive dysfunction. CDT effectively detected executive impairments and correlated significantly with MMSE results. The combination of MMSE and CDT is useful for comprehensive cognitive screening in post-stroke patients.

Keywords: stroke, executive function, cognitive impairment, MMSE, CDT

COMPARATIVE ANALYSIS OF CLINICAL OUTCOMES IN ISCHEMIC STROKE: EFFICACY OF NEUROPROTECTANTS MONOTHERAPY AND NEUROPROTECTANTS WITH THROMBOLYSIS GIVEN AT 24, 48, OR 72 HOURS VERSUS NO NEUROPROTECTANTS

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Background: Global burden of ischemic stroke highlights the need for therapies beyond reperfusion to optimize neurological outcomes. Neuroprotectants offer a promising approach to limit infarct expansion and functional deficit. This study explores the utilization of neuroprotective agents and their impact on patient outcomes.

Objectives: This study aimed to profile ischemic stroke patients, assessing clinical outcomes by neuroprotectant use (monotherapy, with thrombolysis, none) and administration timing (24, 48, 72 hours).

Methods: This retrospective analytical study included patients with ischemic stroke. The functional outcomes (mRS), NIHSS score changes, hospital stay duration, and incidence of early neurological deterioration were assessed. Patients were categorized by neuroprotectant use (none, monotherapy, or with thrombolysis) and administration timing (24, 48, 72 hours). Statistical comparisons and associations were used to evaluate the impact of neuroprotectant administration patterns on these clinical outcomes ($p < 0.05$).

Results: The overall patient group (n=290) was predominantly aged 51-79 (3:2, M:F), with prevalent comorbidities including hypertension (81%) and diabetes (44%). Nearly half presented with moderate baseline NIHSS scores. Overall, patients demonstrated improvement in NIHSS scores and achieved a median discharge mRS of 4. Most (86%) received neuroprotectants within 24 hours, with citicoline being the main neuroprotectant used. This group (n=239) displayed notable neurological recovery: significant NIHSS improvements (often shifting from moderate to minor symptoms), a 7% early neurological deterioration incidence, and a median discharge mRS of 3. Limited data from later administration (48-72 hours) and non-treated groups hinder direct comparative analyses.

Conclusion: In the major cohort receiving neuroprotectants within 24 hours, the majority presented with moderate NIHSS scores. Observed clinical outcomes demonstrated favorable neurological recovery, evidenced by reductions in NIHSS scores from baseline, often improving to minor stroke symptoms. These findings strongly suggest that early administration of neuroprotectants has beneficial effects in ischemic stroke patients.

Keywords: Neuroprotectants stroke, Stroke recovery agents, Timing neuroprotection, Ischemic stroke outcomes, Stroke, NIHSS, mRS

THE ASSOCIATION BETWEEN PROTHROMBIN TIME (PT), ACTIVATED PARTIAL THROMBOPLASTIN TIME (APTT), HEMATOCRIT, AND INTERNATIONAL NORMALIZED RATIO (INR) WITH HOUNSFIELD UNIT (HU) AND HEMORRHAGIC VOLUME IN HEMORRHAGIC STROKE PATIENTS: A PRELIMINARY CROSS-SECTIONAL STUDY

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Introduction: Hemorrhagic stroke, caused by the rupture of cerebral blood vessels, leads to severe brain damage due to increased intracranial pressure. Understanding factors influencing hemorrhagic volume, which correlates with patient prognosis, is crucial. Hematological markers like prothrombin time, activated partial thromboplastin time, hematocrit, and international normalized ratio are key in assessing coagulation and hemodynamic changes during such episodes.

Objective: This study aimed to analyze the correlation between PT, APTT, INR, and hematocrit values with the Hounsfield unit and hemorrhagic volume in patients admitted with hemorrhagic stroke. The goal was to improve clinical outcomes through enhanced diagnostic accuracy and personalized treatment.

Methods: A cross-sectional study was performed involving 15 patients diagnosed with hemorrhagic stroke. Adult patients who underwent a CT scan to confirm the stroke and had coagulation parameters assessed upon admission were included. Patients with a history of trauma, autoimmune illnesses, or malignancy were excluded. Non-contrast CT scans were performed, and coagulation parameters were measured.

Results: The research did not identify significant associations between coagulation markers and CT-scan findings. The absence of statistically significant correlations suggests that these coagulation parameters alone may not suffice to predict HU values or hemorrhagic volume. A comprehensive strategy in diagnosis and treatment, using several diagnostic methods to get best patient results is required. Further research is needed to clarify the complex interactions among coagulation, imaging, and patient outcomes.

Conclusion: The study revealed no statistically significant correlations between PT, APTT, INR, hematocrit levels, and CT-scan results. These parameters alone are insufficient for predicting Hounsfield unit or hemorrhagic volume in hemorrhagic stroke patients. Future studies should explore a comprehensive approach, integrating clinical assessments and advanced imaging techniques for improved diagnosis and management of hemorrhagic stroke.

Keywords: Coagulation Parameter, Bloodwork, Head CT-Scan

ASSOCIATION BETWEEN NUTRITIONAL STATUS AND CLINICAL OUTCOME TOWARDS GERIATRIC PATIENTS WITH ACUTE ISCHEMIC STROKE AT DR. WAHIDIN SUDIROHUSODO HOSPITAL

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Background: Ischemic stroke is the leading cause of disability and death, with pre-morbid nutritional status playing a crucial role in influencing patient prognosis. The Geriatric Nutritional Risk Index (GNRI) is used as a tool to assess nutritional status in the elderly and previous studies have shown that malnutrition based on GNRI is significantly associated with worsening clinical outcome and disability levels in stroke patients, which can be measured using the Modified Rankin Scale (mRS).

Objective: This study aims to determine the association between nutritional status based on the Geriatric Nutritional Risk Index (GNRI) and clinical outcomes on geriatric patients with acute ischemic stroke at Dr. Wahidin Sudirohusodo Hospital.

Methods: The study employed a cross-sectional design, with the study period planned from November 2024 to April 2025. Research variables were GNRI and mRS. The study population included all patients aged over 60 years diagnosed with acute ischemic stroke.

Results: Of the 24 patients studied, the number of males and females was equal, with 12 each. Most patients were at moderate to major risk based on GNRI scoring, with percentages of 54.2% and 29.2%, respectively. Patients ages ranged from 62 to 90 years, with an average of 71.29 years, and mRS scores varied from 4 to 6, indicating moderate to severe disability post stroke. Statistical analysis using the Kruskal-Wallis test revealed a significant association between moderate nutritional status and worsening clinical outcomes (p = 0,026).

Conclusion: This study showing that moderate to major risk based on GNRI scoring was associated with worsening clinical outcomes of acute ischemic stroke patients. Therefore, GNRI can be an important screening tool in assessing the risk of acute ischemic stroke patients, because it is a simple and sensitive screening tool and also does not require a nutritional specialist or the patient's cooperation.

Keywords: Nutritional Status, Geriatric Nutritional Risk Index, Modified Rankin Scale, Acute Ischemic Stroke

WHEN BLOOD SPEAKS FIRST: THE VALUE OF HEMATOLOGICAL INDICATORS IN HEMORRHAGIC STROKE OUTCOME PREDICTION. EXPERIENCE FROM EAST BORNEO PRIMARY REFERRAL CENTER

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Background: Hemorrhagic stroke remains one of the deadliest forms of cerebrovascular disease, with disproportionately high mortality and disability, particularly in low- and middle-income regions. While imaging and clinical scoring are standard in prognosis, access remains limited in many settings. Hematological parameters—reflecting systemic inflammation, tissue injury, and physiological stress—offer a promising yet underutilized avenue for early risk stratification.

Objective: This study aimed to evaluate the predictive value of hematological biomarkers—particularly RDW-SD, NLR, and serum sodium—on functional outcomes and in-hospital mortality among patients with hemorrhagic stroke, using a population-based cohort in Indonesia.

Methods: A retrospective cohort of 219 patients with radiologically confirmed hemorrhagic stroke admitted to a regional referral hospital in Samarinda was analyzed. Hematological and biochemical data were extracted from early hospitalization records. Outcomes included the Barthel Index (functional independence) and discharge status (alive vs. deceased). Bivariate and multivariate regression models were applied, followed by CHAID-based decision tree analysis to identify critical predictive thresholds.

Results: RDW-SD consistently emerged as a strong predictor of both poor functional outcome (p = 0.003; B = –0.318) and increased in-hospital mortality (p = 0.006; OR = 1.148). Elevated NLR and serum sodium levels were also significantly associated with mortality. The decision tree analysis revealed that patients with RDW-SD > 41.5 and NLR > 8.9 had the lowest functional scores and highest mortality risk. The logistic model explained 19.7% of the variance in survival, underscoring the clinical relevance of these simple yet powerful indicators.

Conclusion: RDW-SD and NLR—routinely available, low-cost laboratory parameters—hold significant promise as early clinical predictors in hemorrhagic stroke. Their integration into triage and risk assessment protocols could enhance early decision-making, especially in settings where neuroimaging and intensive monitoring are constrained.

Keywords: Hemorrhagic stroke; RDW-SD; Neutrophil-to-lymphocyte ratio; Serum sodium; Functional outcome; In-hospital mortality; Decision tree analysis

IS THERE AN ASSOCIATION BETWEEN VERTEBRAL ARTERY DOMINANCE (VAD) AND THE RISK OF POSTERIOR STROKE?

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Background: Dominance of the Vertebral Artery (VAD) may influence cerebral perfusion and has been proposed as a contributing factor in the pathophysiology of posterior circulation stroke.

Objective: To assess the association between vertebral artery dominance and posterior stroke and to identify potential risk factors based on patient characteristics.

Methods: A cross-sectional study was conducted on 178 participants, including 46 patients with right VAD and posterior stroke, 46 with left VAD and posterior stroke, and 86 individuals without VAD or stroke confirmed through brain CT or MRI. The diameter of the vertebral arteries was measured using a high-frequency Philips EPIQ 5G ultrasound. Data on sex, age (grouped as <55 and ≥55 years), VAD side (right or left), and stroke type (ischemic or hemorrhagic) were collected. Statistical analysis was performed.

Result: A total of 178 subjects were 81(45.5%) male and 96 (53.9%) female. Age <55 years old 110 (61.8%) and 68 (38.2%) ≥55 years old. Posterior strokes, 95 cases (53.4%), consist of hemorrhagic strokes, 4 cases (4.3%), and ischemic strokes, 91 (95.7%). Right VAD was observed in 36 patients (37.8%) and left VAD in 59 patients (62.2%). Spearman's analysis showed a significant association between Right VAD and Sex (r=0.200; p 0.008); Sex and Stroke classification (Posterior Stroke vs Non-Stroke) (r=0.273; p<0.001); Right VAD and Age (r=0.169; p<0.001); Left VAD and Stroke classification (r=-0.213; p<0.001); Age and Stroke classification (r=0.262; p=0.024). Multivariate Regression Generalized Linear Model shows Right VAD and Posterior Stroke (p=0.163); Sex and Right VAD (B=-0.343; OR=0.71, 95% CI=0.52 – 0.9, p=0.027); Age to right VAD (B=-0.308, OR=0.73, 95% CI=0.53 – 1.00, p=0.054)

Conclusion: Right VAD has a significant correlation to posterior stroke but is not significant as a risk factor. VAD may influence the hemodynamics of posterior circulation. Further studies with larger sample sizes are required to confirm VAD as a risk factor. Male is the risk factor for right VAD, and age may play a role in the risk profile for right VAD.

Keywords: Vertebral Artery Dominance (VAD), Stroke, Posterior Circulation

SERUM CALCIUM AS A MARKER FOR HEMATOMA VOLUME IN HEMORRHAGIC STROKE

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Background: Hemorrhagic stroke is a severe form of stroke associated with high rates of mortality and long-term disability. Despite advancements in medical management, clinical outcomes remain unfavorable. Hematoma location and volume are critical prognostic factors. Serum calcium plays a key role in numerous physiological functions, including neuronal excitability, vascular tone regulation, and notably, the coagulation cascade.

Objective: This study aims to determine the prevalence of hypocalcemia in hemorrhagic stroke patients admitted to Regional Hospital of Dr. Zainoel Abidin, and to assess the correlation between serum calcium levels and intracerebral hemorrhage volume.

Methods: This retrospective observational study included 99 patients diagnosed with hemorrhagic stroke via head CT scan upon hospital admission between January and April 2025. The cohort comprised 61 males and 38 females, with the majority aged over 65 years. Of the 99 patients, only 37 had available serum calcium data and were therefore included in the study population; hypocalcemia was defined as a serum calcium level below 8.5 mg/dL. Hematoma volume was measured based on radiological assessment. Statistical analysis was performed using the non-parametric Mann-Whitney U test due to the non-normal distribution of data.

Results: Among the 37 patients included in the study, 72.2% (n = 26) exhibited serum calcium levels below 8.5 mg/dL, while 27.8% (n = 11) had levels equal to or above this threshold. Overall, hypocalcemia was observed in 70.3% of cases. A statistically significant association was found between lower serum calcium levels and increased hematoma volume (p = 0.027), suggesting that hypocalcemia may contribute to more extensive bleeding in patients with hemorrhagic stroke.

Conclusion: The prevalence of hypocalcemia was high among patients with hemorrhagic stroke. A significant correlation was identified between reduced serum calcium levels and increased hematoma volume. These findings highlight the potential value of routine serum calcium evaluation in hemorrhagic stroke patients as part of the initial assessment, which may assist in predicting prognosis and clinical outcomes.

Keywords: hemorrhagic stroke, Serum calcium, hypocalcemia, hematoma volume

RECOGNIZING STROKE CHAMELEONS: A SYSTEMATIC REVIEW OF ATYPICAL SYMPTOMS AND MISDIAGNOSIS IN ACUTE STROKE MANAGEMENT

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Background: Chameleon stroke (SC) describes stroke occurrences with atypical symptoms leading to misdiagnosis and delayed recognition. In emergency settings, it may mislead from neurovascular etiology, higher risk of mismanagement, and missed intervention, recognizing SC is crucial to reduce diagnostic errors and improve prognosis.

Objective: Analyze clinical characteristics and symptoms of SC. Review diagnostic procedures for acute ischemic stroke (AIS) for SC Patients

Method: Studies were sourced on October 2, 2024, via PubMed and PMC. Seven studies met inclusion criteria: six retrospective studies (chart reviews, cohort, registry data), and one observational case series totaling 523 SC cases. Including AIS patients initially misdiagnosed or presenting with fewer focal symptoms studies, hemorrhagic stroke were excluded. The ROBINS-I tool was used for bias assessment.

Result: SC patients are younger, lower vascular risk profile, fewer statin use, and lower blood pressure at admission and common non focal symptoms (*amnesia,* epigastric pain, vertigo, nausea, sensory loss, syncope, etc) with vertebrobasilar/cerebellar strokes and had history of intracranial hemorrhage. Magnetic resonance imaging (with Diffusion-Weighted Imaging.) and computed tomography were the main tools to confirm stroke in chameleon cases within 72 hours for all TGA patients that revealed the “hidden” infarcts. Although there are some study that shows CT/MRI changes were either missed or misinterpreted and with that it was found several unfavorable occurrence such as 33% of missed strokes initially presented within the 3-hour thrombolysis window, initially 23.4% of chameleons *would have* qualified for thrombolysis, and etc.

Conclusion: Chameleon cases often occur in slightly younger patients with relatively benign risk Cprofiles, and tend to involve posterior circulation territory, and the study emphasizes that any non-traditional symptom (especially headache, vertigo, etc) should raise stroke suspicion.

THE ASSOCIATION OF NON-TRADITIONAL LIPID MARKERS AND STROKE-ASSOCIATED INFECTION IN HEMORRHAGIC STROKE PATIENTS

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Background: Stroke-associated infection (SAI) affects up to 40% of hemorrhagic stroke patients, increasing their morbidity and mortality. Dyslipidemia is a known cerebrovascular risk factor but its role in post-stroke infection remains unclear. Non-traditional lipid markers such as the atherogenic index of plasma (AIP), atherogenic coefficient (AC), total cholesterol to HDL ratio (TC/HDL), and triglyceride to HDL ratio (TG/HDL) may reflect inflammation and help predict SAI in hemorrhagic stroke.

Objectives: To evaluate the association between AIP, AC, TC/HDL, and TG/HDL and the development of SAI in hemorrhagic stroke patients.

Methods: This cross-sectional study was conducted at Dr. Sardjito General Hospital, Yogyakarta, using Stroke Registry data from January 2020 to December 2024. Patients with stroke onset <48 hours were included, excluding those with infection on admission. Lipid profiles were collected within 24 hours of hospitalization to calculate AIP, AC, TC/HDL, and TG/HDL. SAI was defined as urinary tract infection, hospital-acquired pneumonia, or sepsis, diagnosed during hospitalization. Associations between lipid markers and SAI were analyzed.

Results: Among 446 hemorrhagic stroke patients, 204 (45.7%) developed SAI and 242 (54.3%) did not. Median values in the SAI and non-SAI groups, respectively, were: TC/HDL 4.09 (3.38–5.23) and 4.07 (3.41–4.95); TG/HDL 2.50 (1.53–4.01) and 2.50 (1.75–3.62); AIP 0.40 (0.19–0.60) and 0.40 (0.25–0.56); AC 3.09 (2.38–4.23) and 3.07 (2.41–3.95). No significant differences were found between groups ($p > 0.05$ for all).

Conclusion: None of the non-traditional lipid profiles investigated in this study, AIP, AC, TC/HDL, and TG/HDL, were associated with SAI in patients with hemorrhagic stroke. Further research is warranted to identify better predictors of infection risk in this population.

Keywords: Non-traditional lipid biomarkers, hemorrhagic stroke, stroke associated infection

PROGNOSTIC VALUE OF IDH MUTATION STATUS ON FUNCTIONAL OUTCOMES IN GLIOMA: A SINGLE-CENTER STUDY FROM INDONESIA

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Background: Isocitrate dehydrogenase (IDH) mutation status has emerged as a key prognostic marker in glioma, influencing both survival and therapeutic response. Despite its global significance, studies correlating IDH status with functional outcomes remain limited, particularly in Southeast Asian populations where routine molecular diagnostics are still evolving.

Objective: To evaluate the association between IDH mutation status and Karnofsky Performance Status (KPS) in glioma patients treated at a tertiary referral center in East Java.

Methods: A retrospective descriptive study was conducted on 31 glioma patients diagnosed at Dr. Saiful Anwar General Hospital from 2020 to 2024. Data on WHO tumor grade, IDH mutation status, and KPS scores were collected. KPS scores were categorized ordinally and compared between IDH mutant and wild-type groups using the Mann-Whitney U test.

Results: IDH mutations were predominantly observed in WHO Grade II and III gliomas, whereas IDH wild-type was dominant in Grade IV tumors. Median KPS score was significantly higher in the IDH mutant group (median = 3.0) compared to the IDH wild-type group (median = 1.0), with a p-value of 7.7×10^{-7}. This indicates a robust positive correlation between IDH mutation status and better functional status.

Conclusion: IDH mutation status is strongly associated with improved functional outcomes in glioma patients, as reflected by higher KPS scores. These findings emphasize the clinical value of incorporating molecular profiling into routine neuro-oncology practice. Furthermore, they highlight the potential for integrating molecular-functional frameworks into national guidelines for more precise and patient-centered glioma management in resource-limited settings.

Keywords: Glioma, IDH, Karnofsky, Prognosis, Performance

ASSOCIATION BETWEEN PREOPERATIVE HEMATOLOGICAL INFLAMMATORY MARKERS AND MENINGIOMA GRADE

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Background: Meningiomas are the most common benign intracranial tumors. Although most meningiomas are considered benign (grade 1), a minority exhibit more aggressive features and are classified as high-grade (grade 2 and 3). Preoperative hematologic inflammatory markers have been reported as prognostic factors for several solid tumors, but the prognostic value in meningioma has been analyzed in only a few studies.

Objective: This study was designed to evaluate the usefulness of preoperative hematological inflammatory markers, such as the neutrophil-to-lymphocyte ratio (NLR), the lymphocyte-to-monocyte ratio (LMR), and the platelet-to-lymphocyte ratio (PLR), in predicting meningioma grade.

Methods: The retrospective study included 26 patients with newly diagnosed meningiomas was conducted between January 2023 until December 2024. We analyzed associations between patients clinical data (age, leukocyte, platelet, neutrophil, lymphocyte, monocyte, NLR, PLR and LMR) with grade of meningiomas.

Results: Of the 111 patients with meningioma, seven did not undergo surgery, two had undergone previous surgery, 21 had leukocyte levels greater than $11x10^3$/L, and 55 had incomplete laboratory data. Therefore, only 26 patients (22 grade 1 and 4 grade 2), conducted the study. The study consisted of 24 women and 2 men with a median age of 47 (36-63) and 50 (42-56), respectively. Fifteen patients used three-monthly birth control injections for more than ten years. Three patients had hypertension, and one had diabetes mellitus. The subjects showed significance in platelet, neutrophil, monocyte, and PLR levels with tumor grade ($p < 0.05$ for all). Leukocyte and PLR were not significantly associated with tumor grade; however, they increased in grade 2 meningioma compared with grade 1 meningioma.

Conclusion: Preoperative hematologic inflammatory markers, such as platelets, neutrophils, monocytes and NLR, have been found to be cost-effective methods of demonstrating potential value for meningioma grade.

Keywords: meningiomas, platelet-lymphocyte ratio, hematological inflammatory marker

THE EFFECT OF GABAPENTINOIDS ON CANCER CELL PROGRESSION: AN *IN VITRO* STUDY ON CERVICAL ADENOCARCINOMA CELL CULTURE (HELA CRM-CCL-2)

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Background: Gabapentinoids, including gabapentin and pregabalin, are widely used as adjuvant analgesics in cancer-related pain. Emerging evidence suggests these agents may exert modulatory effects on cancer cell behavior beyond their analgesic properties.

Objective: This study aimed to evaluate the effects of gabapentinoids on the progression of cervical adenocarcinoma cells (HeLa CRM-CCL-2) through assessment of apoptosis and cytotoxicity in an in vitro setting.

Methods: An *in vitro* randomized experimental design was conducted between August and September 2023. HeLa cells were cultured and divided into five groups: a negative control and four treatment groups exposed to graded concentrations of gabapentin or pregabalin (7.5 µM, 10 µM/15 µM, 20 µM/30 µM, and 40 µM). Apoptosis was evaluated using Annexin V staining, while cytotoxicity was assessed via the microtetrazolium (MTT) assay. Data were analyzed using one-way ANOVA followed by Least Significant Difference (LSD) post hoc test at a 5% significance level.

Results: Both gabapentin and pregabalin significantly increased apoptotic indices and cytotoxicity in a dose-dependent manner ($p < 0.05$), with the highest apoptotic and cytotoxic effects observed at the 40 µM concentration. The results were consistent across early and late phases of apoptosis.

Conclusion: Gabapentinoids demonstrate potential antineoplastic properties in cervical adenocarcinoma cells by promoting apoptosis and cytotoxicity in a dose-responsive manner. These effects are likely mediated through ion channel inhibition, BCAT1 suppression, and modulation of PI3K and apoptotic pathways. Gabapentinoids may represent promising adjuvant agents in the management of cervical cancer, warranting further investigation in *in vivo* and clinical settings.

Keywords: Gabapentinoids, Cervical adenocarcinoma, Apoptosis, Cytotoxicity, HeLa cells

MIR-21 IN GLIOMA: AN UNEXPECTED BIOMARKER OF PATIENT FUNCTIONAL STATUS BEYOND MOLECULAR TAXONOMY

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Background: MicroRNA-21 (miR-21) is frequently dysregulated in gliomas, but its diagnostic/prognostic value across diverse clinical and molecular subgroups remains unclear.

Objectives: This study comprehensively evaluates miR-21's correlations with WHO grade, histologic subtype, IDH status, MGMT status, seizure occurrence, and functional status (KPS) in glioma patients.

Methods: We analysed miR-21 expression using qRT-PCR in a heterogeneous cohort of glioma specimens (all grades/subtypes, n=212) with annotated molecular profiles (IDH, MGMT), clinical features (seizure history), and KPS scores. Statistical correlations were assessed, and ROC analysis evaluated miR-21's predictive capacity for KPS groups (cases: KPS ≥40; controls: KPS <40).

Results: miR-21 expression showed no significant correlation with WHO grade, histologic subtype, IDH status, MGMT methylation, or seizure occurrence. However, it demonstrated a modest but significant association with KPS (ROC-AUC = 0.6749). At optimal cut-off, miR-21 predicted fair functional status (KPS ≥40) with 47.12% sensitivity, 84.62% specificity, and a positive likelihood ratio of 3.063.

Conclusion: While miR-21 lacks utility as a biomarker for standard glioma classification or molecular subtypes, it exhibits selective prognostic relevance for functional status (KPS). Its high specificity suggests potential in identifying patients with preserved functional capacity, though low sensitivity limits standalone clinical application. This unexpected dissociation from tumour-intrinsic variables highlights miR-21's possible role in microenvironmental or neurophysiological processes governing functional resilience. Further investigation into miR-21 as a predictor of therapeutic tolerance or quality-of-life outcomes is warranted.

Keywords: Glioma, KPS, miR-21, prognosis

NEUROIMAGING CHARACTERISTICS OF INTRACRANIAL TUMOR PATIENTS IN NEUROLOGY INPATIENTS WAHIDIN SUDIROHUSODO HOSPITAL MAKASSAR

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Background: Intracranial tumors originate from different cells either within intracranial cavity (primary tumor) or from systemic tumors that metastasize.

Neuroimaging is the main modality in management of intracranial tumors patients. With appropriate imaging modalities, lesions can be identified so that appropriate treatment can be determined.

Objective: This study aims to provide an overview of use of imaging modalities and characteristics of radiological findings in patients with intracranial tumors.

Methods: This research is a descriptive study with cross-sectional design using data taken from medical records of neurology inpatients at Dr.Wahidin Sudirohusodo Makassar Hospital with total sampling method since March 2023-February 2024. Data taken includes demographic and imaging characteristics, divided based on tumor type.

Results: 114 subjects were obtained. Mean age of 51.95 years with greater proportion of male gender (57%). Imaging modalities used were CT scan without contrast (14%), CT scan with contrast (17.5%), MRI without contrast (2.6%), MRI with contrast (51.8%) and multimodality (14%). Intracranial primary tumors (58.8%) were more common than metastatic tumors (41.2%). In primary tumor group, the most imaging characteristics were solitary lesions (83.6%), while in metastatic tumor group, the majority were multiple lesions (85.1%). Perifocal edema was most common radiological characteristic in both groups.

Conclusion: MRI with contrast was the most common modality in this study. MRI with contrast is the modality of choice for identifying intracranial tumor lesions and determining appropriate management. The most common radiological characteristic in both groups was perifocal edema caused by increased vascular permeability.

Keywords: Neuroimaging, intracranial tumors, imaging modalities

WHITE MATTER ATROPHY CORRELATES WITH EARLY COGNITIVE IMPAIRMENT AFTER WHOLE BRAIN RADIOTHERAPY IN BRAIN METASTASES

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Background: Whole Brain Radiotherapy (WBRT) remains a standard treatment for multiple brain metastases, yet it is frequently associated with cognitive decline and morphological brain changes, notably white matter atrophy. While structural changes post-WBRT are recognized, few studies have quantitatively linked these alterations to objective cognitive assessments.

Objective: This study aimed to evaluate the neurobehavioral effects of WBRT by examining changes in MRI-measured brain volume and cognitive function using the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA).

Methods: A prospective quasi-experimental study was conducted on 25 adult patients with MRI-confirmed brain metastases who underwent standard WBRT (36 Gy in 12 fractions). MRI volumetry and MoCA-INA tests were performed before and one month after WBRT. Brain volumes were analyzed using 3D Slicer and FreeSurfer, while MoCA-INA was administered by trained clinicians. Statistical analyses included Wilcoxon signed-rank tests and multivariate linear regression.

Results: WBRT significantly reduced total brain volume (median: 1171 cc to 1133 cc; $p < 0.05$) and MoCA-INA scores (median: 26 to 18; $p < 0.001$). Greater cognitive decline was associated with ECOG ≥2 ($\beta = 1.5$, $p = 0.006$), >3 brain metastases ($\beta = 0.9$, $p = 0.028$), absence of stereotactic radiosurgery (SRS) ($\beta = 1.2$, $p = 0.014$), and lack of brain metastasis surgery

(β = 1.3, p = 0.011). A strong positive correlation was observed between white matter volume loss and MoCA-INA score decline.

Conclusion: WBRT induces significant brain atrophy and early cognitive impairment in patients with brain metastases. White matter loss emerged as a key biomarker for cognitive decline. These findings underscore the importance of patient stratification and integrating neuroprotective strategies, such as hippocampal-sparing techniques and adjunctive SRS, to preserve cognitive function.

Keywords: Whole Brain Radiotherapy, Brain Atrophy, Cognitive Decline.

PSYCHOLOGICAL AND NEUROLOGICAL MANIFESTATIONS AT A TEMPORARY HOSPITAL FOLLOWING A MAJOR EARTHQUAKE IN MYANMAR

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Introduction: Natural disasters, such as earthquakes, can cause significant psychological and neurological morbidity among affected populations. In the immediate aftermath, survivors are particularly vulnerable to both acute conditions and the exacerbation of chronic diseases. This study aimed to assess the prevalence and types of psychological and neurological manifestations observed at a temporary hospital established in Myanmar following a major earthquake.

Methods: A descriptive cross-sectional study was conducted over a two-week period at a temporary hospital in an earthquake-affected region of Myanmar. All patients presenting with neurological or psychiatric symptoms during the study period (n = 254) were evaluated. Demographic data, including age and gender, were recorded. Clinical assessments focused on psychological and neurological presentations, as well as the worsening of pre-existing neurological conditions.

Results: Of the 254 patients assessed, 176 (69.3%) were women and 78 (30.7%) were men. The most represented age group was 51–60 years (24.4%). The most common manifestations included post-earthquake dizziness (35.4%) and headaches (17.3%). Psychological symptoms were also prevalent, with insomnia (7.9%), anxiety (6.7%), and acute stress disorder (5.9%) frequently reported. New-onset strokes (n = 14) were observed, largely attributed to stress, financial problems, poor accommodation conditions, and disruptions in access to essential medications such as antihypertensives and antidiabetics. Additionally, there was a worsening of pre-existing neurological conditions, including epilepsy (3.1%), Parkinson's disease (2.4%), dementia (0.8%), and migraine/headache disorders (3.9%).

Conclusion: This study highlights the substantial psychological and neurological burden following natural disasters. The high rates of acute symptoms and exacerbation of chronic conditions underscore the urgent need for integrated mental health and neurological services in post-disaster response efforts. Future disaster preparedness programs must prioritize comprehensive neuropsychiatric support to improve health outcomes and enhance resilience among affected populations.

CLINICAL PRESENTATIONS AND OUTCOMES OF CONFIRMED ACUTE INFECTIOUS ENCEPHALITIS FROM VARIOUS ORGANISMS AT A MYANMAR TERTIARY CENTER

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Introduction: A multitude of infectious agents cause acute encephalitis. This study analyzes the acute infectious encephalitis cases with known etiologies in Myanmar in order to characterize distribution, presentations and outcome.

Methods: The study prospectively recruited confirmed acute infectious encephalitis patients at a tertiary center in Myanmar over 1-year-period from April 2024 to March 2025. Those with unidentified organisms, tuberculous and immune etiologies were excluded. Pathogen identification was performed using CSF analysis including multiplex PCR, RT-PCR to detect JEV, DENV, ZIKV, and CHIKV, and culture.

Results: Among 38 patients, herpesviruses were the most common 15 (39.5%), including HSV-1 (8 cases), HSV-2, HHV-6 (1 each) and VZV (5). Three CMV and two Arboviral (dengue and Zika) encephalitis were reported. Bacterial infections occurred in 12 (31.58%): Haemophilus influenzae (4/38), Streptococcus pneumoniae (2/38), and the rest Streptococcus pyogenes, Staphylococcus haemolyticus, Staphylococcus arlettae, Streptococcus agalactiae, and listeria monocytogenes one each. Fungal causes (one Aspergillus (2.5%) and five cryptococcus neoformans (13.16%)) and parasitic etiology (one cerebral malaria) were noted. Localization-wise, 75% of HSV-1 encephalitis showed unilateral temporal involvement, HSV-2 caused right occipital and temporal infarcts with hemorrhagic transformation, CMV affected bilateral globus pallidus, Zika affected bilateral thalamus and hippocampi, but the rest had no clear localization even with MRI and EEG. Four VZV encephalitis followed Ramsay Hunt syndrome and one followed herpes zoster ophthalmicus. 7/38 (18.42%) were immunocompromised. Mortality 7.89% (3/38): one each of HSV-1, Zika, Listeria encephalitis. Refractory seizures with repeated admissions were noted in HHV-6 patient, 67% of CMV, and 20% of cryptococcal meningoencephalitis.

Conclusion: Infectious encephalitis cases at our center show varying etiologies and presentations, and outcomes. Pathogen-specific clinical patterns can aid in early suspicion and prompt management. We aim to apply this experience to support patients who cannot afford PCR.

INVESTIGATING ANTIBIOTIC RESISTANCE IN BACTERIAL MENINGITIS: IS CEFTRIAXONE STILL RELIABLE?

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Background: Bacterial meningitis remains a critical neurological emergency with substantial morbidity and mortality. Empirical therapy in Indonesia predominantly includes ceftriaxone, though rising resistance may compromise its effectiveness.

Objective: This study aimed to evaluate the current resistance patterns of bacterial meningitis pathogens to ceftriaxone and examine associated clinical and laboratory characteristics.

Methods: This cross-sectional study included adult patients (≥18 years) with cerebrospinal fluid (CSF) culture-confirmed bacterial meningitis admitted to Dr. Soetomo General Academic Hospital between January 2023 and April 2025. Demographic data, clinical presentations, and laboratory results were collected from medical records. The susceptibility of pathogens to ceftriaxone was analyzed, and associations between resistance status and clinical or laboratory variables were examined.

Results: Among 48 patients analyzed, the majority were infected with Gram-positive cocci (72.9%), predominantly Staphylococcus species (62.5%). Ceftriaxone resistance was observed in 52.1% of cases. Patients with ceftriaxone-resistant infections more frequently had prior antibiotic use (p=0.012), GCS <13 (p=0.010), and low CSF protein levels (p=0.008). Staphylococcus spp. were significantly more common in the resistant group (p=0.001). Although mortality was higher in the resistant group (44.0%), the difference was not statistically significant (p=0.195).

Conclusion: The high prevalence of ceftriaxone resistance among bacterial meningitis pathogens in this study raises concern about continued monotherapy use. Combining ceftriaxone with other broader-spectrum antibiotics may be necessary to ensure adequate empirical coverage. Early identification of clinical and laboratory indicators may support prompt therapeutic adjustments.

Keywords: bacterial meningitis, ceftriaxone, antibiotic resistance, cerebrospinal fluid

IMPLEMENTATION CHALLENGES AND CURRENT STATUS OF HLA-B15:02 SCREENING IN SOUTHEAST ASIA HEALTHCARE SYSTEMS

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Background: The HLA-B15:02 allele is strongly associated with carbamazepine-induced idiosyncratic severe cutaneous adverse drug reactions (SCARs), which are notably prevalent in Southeast Asia (SEA). Preemptive genetic screening has been proven effective in mitigating risk and is more cost-efficient than managing SCARs. However, its implementation across SEA healthcare systems remains inconsistent

Objective: This qualitative study aimed to explore the current status and key challenges in implementing HLA-B15:02 screening prior to carbamazepine prescription in SEA countries.

Methods: Focus group discussions (FGDs) were conducted with neurologists purposively sampled from various SEA countries, each with at least five years of clinical experience. Focus group discussions were held in English via video conferencing, recorded, and transcribed verbatim. An interpretative phenomenological analysis was performed using NVivo15 software.

Result: Eleven neurologists from six different SEA countries participated, most of whom were based in urban tertiary hospitals. All countries, except Indonesia, reported the availability of HLA-B15:02 screening within their national healthcare systems, with countries like Thailand and Malaysia integrating it into their epilepsy treatment guidelines. Key barriers to implementation were categorized into five domains, such as availability (limited commercial supply and restrictions for research use); accessibility (geographical and institutional disparities, centralized services, conditional coverage, and financial burden due to out-of-pocket costs); awareness (low familiarity among general neurologists and poor retention of knowledge despite educational efforts); regulatory and logistic issues (unclear clinical priorities, absence of referral pathways, shifting prescribing practices away from carbamazepine, and long turnaround time); and promotion gaps (limited government engagement, low public awareness, and insufficient local data to support policy prioritization).

Conclusion: While HLA-B*15:02 screening is available in several SEA countries, its broader implementation faces significant challenges, particularly in its accessibility, awareness, financial and policy support. Addressing these barriers is crucial for equitable integration into national health systems

Keywords: HLA-B15-02 screening; implementation; Southeast Asia countries; health care systems; challenges

EVALUATING PROGNOSTIC FACTORS IN MENINGOENCEPHALITIS PATIENTS WITH ACUTE SYMPTOMATIC SEIZURES: A RETROSPECTIVE STUDY AT DR. KARIADI GENERAL HOSPITAL, 2022–2025

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Background: Meningoencephalitis is a life-threatening condition characterized by inflammation of the brain and meninges. One of its most common complications is acute symptomatic seizures, which are often linked to poor clinical outcomes. Understanding the factors associated with prognostic outcomes is essential for reducing mortality, particularly in the Indonesian population.

Objective: To evaluate the prognostic factors in meningoencephalitis patients with acute symptomatic seizure at Dr. Kariadi General Hospital between Januari 2022 until April 2025.

Methods: This retrospective study employed an analytical cross-sectional design using the independent t-test and chi-square. A total of 36 hospitalized adult patients (aged >18 years) diagnosed clinically with meningoencephalitis and presenting with acute symptomatic seizures were included.

Result: Among the 36 patients, 28 were discharged and 8 died. The most common etiologies were viral meningoencephalitis and suspected autoimmune meningoencephalitis. A lower initial Glasgow Coma Scale (GCS) score, higher blood neutrophil-to-lymphocyte ratio (NLR), and decreased absolute lymphocyte count (ALC) were significantly associated with mortality ($p < 0.05$). In contrast, CSF WBC and CSF NLR showed no significant differences between the discharged and deceased groups. An increase of 1 point in the GCS score is associated with a 38.4% reduction in the odds of mortality (OR = 0,616), meanwhile an increase of 1 unit in the NLR value associated to a 14% higher likelihood of mortality (OR = 1.140).

Conclusion: Low GCS score at admission, high blood NLR, and decreased ALC were significantly associated with increased mortality. Blood NLR and ALC are more relevant indicators of systemic inflammation in predicting patient outcomes compared to cerebrospinal fluid parameters. Demographic factors such as age and gender were not significantly associated with patient clinical outcomes.

Keywords: Meningoencephalitis, Acute Symptomatic Seizure, Prognostic Factor, Clinical outcome

ASSESSMENT OF NUTRITION SCORE IN ISCHEMIC STROKE PATIENTS WITH SEPTIC SHOCK ADMITTED TO THE INTENSIVE CARE UNIT: A RETROSPECTIVE STUDY FROM 2022 TO 2024

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Background: Ischemic stroke complicated by septic shock is associated with complex clinical management and prolonged intensive care. Nutritional risk is a key but often overlooked factor that can influence the trajectory of recovery. The Modified Nutrition Risk in the Critically Ill (NUTRIC) Score serves as a validated tool for identifying patients at high nutritional risk. However, its relationship with treatment outcomes such as ICU length of stay (LOS) and duration of mechanical ventilation remains insufficiently studied in this specific patient group.

Objective: To assess the correlation between Modified NUTRIC Score and clinical outcomes—specifically ICU length of stay and duration of mechanical ventilation—in ischemic stroke patients with septic shock.

Methods: This retrospective study included 53 adult patients (≥18 years) with confirmed ischemic stroke and septic shock admitted to the ICU of a tertiary hospital from January 2022 to December 2024. Nutritional risk was assessed using the Modified NUTRIC Score within the first 48 hours of ICU admission. Spearman's correlation test was used to evaluate the relationship between NUTRIC scores and both LOS and ventilator duration.

Results: The analysis revealed a statistically significant positive correlation between the NUTRIC Score and the duration of mechanical ventilation ($p = 0.006$; $r = 0.373$), indicating a weak but significant positive association. Similarly, a significant moderate positive correlation was found between the NUTRIC Score and ICU length of stay ($p = 0.001$; $r = 0.459$). These findings suggest that higher nutritional risk is associated with longer ICU treatment and prolonged ventilator support.

Conclusion: The Modified NUTRIC Score demonstrates a significant positive correlation with both ICU length of stay and duration of mechanical ventilation in ischemic stroke patients with septic shock. Early identification of nutritional risk may help guide supportive interventions to optimize critical care outcomes.

Keywords: Ischemic stroke; Septic shock; Intensive Care Unit; Modified NUTRIC Score; Nutritional risk; Length of stay; Mechanical ventilation; Critical care outcomes

PREDICTORS OF MORTALITY IN PATIENTS WITH TETANUS IN THE MODERN ERA: A RETROSPECTIVE COHORT STUDY

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Background: Tetanus is a life-threatening neurological disorder caused by Clostridium tetani, characterized by painful muscle spasms and autonomic dysfunction. Despite being preventable through vaccination, it remains a major public health concern in low- and middle-income countries. Mortality rates are high in resource-limited settings, although early recognition and appropriate treatment can significantly improve outcomes.

Objective: To evaluate clinical characteristics, disease severity, treatment strategies, and in-hospital outcomes of tetanus patients treated at a tertiary referral center.

Methods: This retrospective cohort study included all patients diagnosed with tetanus who presented to the emergency department of Dr. Cipto Mangunkusumo Hospital, Jakarta, from January 2020 to April 2025. Data on clinical manifestations, disease severity (including Dakar score), and management were collected. Logistic regression analysis was used to identify independent predictors of mortality.

Result: A total of 22 patients were included, with 10 (45%) deaths occurring within a median of 5.5 days. Nearly half (46%) had moderate to severe disease (Dakar score ≥3), and only one case of localized tetanus was observed. Thirteen patients (59%) required ICU admission, and 15 (68%) received mechanical ventilation. In univariate analysis, onset <3 days (p = 0.006, OR 25.7), muscular rigidity (p = 0.02, OR 16.5), higher Dakar score (p = 0.047), and delayed administration of human tetanus immunoglobulin (HTIG) (p = 0.02) were significantly associated with mortality. However, in multivariate analysis, only delayed HTIG administration remained independently associated with mortality (p = 0.04, OR 1.9).

Conclusion: Tetanus cases in this cohort were predominantly moderate to severe, with high mortality particularly associated with delayed HTIG administration. These findings highlight the need for prompt recognition and proper tetanus management to improve outcome.

Keywords: Tetanus, Human Tetanus Immunoglobulin, Mortality, Dakar Score, Predictors

CLINICAL FEATURES, CSF ANALYSIS AND MRI FINDINGS OF CNS TUBERCULOMAS: A CASE REPORT KHMER SOVIET FRIENDSHIP HOSPITAL, CAMBODIA, SEP. 2024

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Introduction: Tuberculosis (TB), an infectious disease caused by Mycobacterium tuberculosis, typically affects the lungs (pulmonary TB) but can also spread to other sites (extrapulmonary TB) through lymphatic or hematogenous dissemination. CNS TB is relatively rare, accounting for about 1-5% of all TB cases, but it is one of the most serious forms of the disease due to its high morbidity and mortality rates. There's 15% of TB CNS involvement are AIDS-related. The clinical presentation of CNS TB includes tuberculous meningitis, tuberculoma, and spinal tuberculosis (Pott's disease). Tuberculous meningitis (TBM), the most common form of CNS TB, is characterized by the inflammation of the meninges, often presents with nonspecific symptoms such as headache, fever, vomiting, and altered mental status, making early diagnosis challenging. If left untreated, TBM can lead to neurological complications like hydrocephalus, neurological deficit, and coma. CNS tuberculomas are localized, granulomatous lesions in the brain or spinal cord caused by Mycobacterium tuberculosis. They represent a form of extrapulmonary tuberculosis and occur when the infection spreads to the CNS, leading to the formation of tuberculous nodules. Tuberculomas typically develop when the body's immune response contains the infection in a localized area, resulting in granuloma formation—small, firm masses of immune cells surrounding the bacteria. These lesions can appear anywhere within the CNS, including the brain parenchyma, meninges, or spinal cord, and their size can range from a few millimeters to several centimeters. It represents 10%-30% of intracranial masses in tuberculosis endemic areas. Although less common than tuberculous meningitis, CNS tuberculomas can have serious clinical implications due to their location and potential for neurological damage. Diagnosing CNS tuberculomas is challenging due to their nonspecific symptoms and the difficulty in distinguishing them from other intracranial space-occupying lesions such as tumors or abscesses. Advanced imaging techniques like magnetic resonance imaging (MRI) with contrast or computed tomography (CT) scans are essential for visualization, revealing ring-enhancing lesions typical of tuberculomas. Definitive diagnosis often requires microbiological confirmation through biopsy or molecular tests like polymerase chain reaction (PCR). Despite appropriate treatment, CNS tuberculomas can lead to long-term neurological complications. Early diagnosis and prompt initiation of therapy are crucial for preventing permanent damage and improving patient outcomes.

Keywords: CNS tuberculoma; TB neuroimaging study of Brain and Spine

EFFECTIVENESS OF CO-TRIMOXAZOLE THERAPY FOR CEREBRAL TOXOPLASMOSIS IN HIV PATIENTS

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Background: Cerebral toxoplasmosis remains a clinically significant opportunistic infection among people living with HIV, despite substantial reductions in incidence and mortality following the widespread implementation of antiretroviral therapy. Pyrimethamine-based regimens are commonly used as first-therapy. However, access to pyrimethamine is increasingly limited due to high cost and availability issues, particularly in resource-limited settings. As a result, co-trimoxazole is frequently used as an alternative. Currently, there is no updated evaluation of outcomes using TMP-SMX for cerebral toxoplasmosis in people living with HIV. Therefore, this study is conducted to ascertain the effectiveness of co-trimoxazole in treating cerebral toxoplasmosis among HIV-infected patients.

Objective: To evaluate the effectiveness of co-trimoxazole therapy in the treatment of cerebral toxoplasmosis among HIV-infected patients.

Methods: This study is an evidence-based case report of a 25-year-old patient with HIV presented with severe headache and seizures. Imaging revealed a round mass with ring enhancement. Serum testing showed reactive Toxoplasma IgG. The diagnosis was established as Cerebral Toxoplasmosis. The patient was advised to take pyrimethamine, but it was unavailable, so the patient took cotrimoxazole instead. The patient asked whether cotrimoxazole is more effective and safer for treating their condition. A search was conducted using MEDLINE and Cochrane Library. Studies were screened in accordance with PRISMA guidelines based on predefined inclusion and exclusion criteria, and were subsequently ranked according to their validation and level of evidence.

Results: The studies included to be appraised are four controlled trials and three cohort studies. All of the studies indicate that co-trimoxazole offers comparable clinical efficacy, improved radiological outcomes, and minimal adverse events.

Conclusion: We recommend co-trimoxazole in HIV patients with cerebral toxoplasmosis for its wide availability, proven non-inferior efficacy compared to pyrimethamine, and minimal side effects.

Keyword: Co-trimoxazole, Cerebral Toxoplasmosis, HIV

ASSOCIATION OF SYSTEMIC IMMUNE-INFLAMMATION INDEX AND PLATELET-LYMPHOCYTE RATIO WITH MOCA-INA SCORES IN ALZHEIMER'S DEMENTIA PATIENTS: SINGLE CENTER COHORT RETROSPECTIVE STUDY

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Objectives: Chronic systemic inflammation has been increasingly recognized as a contributing factor in the pathogenesis of Alzheimer's Dementia (AD). Peripheral inflammatory biomarkers such as the Systemic

Immune-Inflammation Index (SII) and Platelet-Lymphocyte Ratio (PLR) reflect underlying immune responses that may correlate with cognitive decline. The Montreal Cognitive Assessment Indonesia Version (MoCA-INA) is a cognitive screening tool used to evaluate cognitive impairment in AD patients. This study aims to examine the association between SII and PLR with MoCA-INA scores in Alzheimer's dementia patients to evaluate their potential as non-invasive biomarkers of cognitive impairment.

Methods: This retrospective cohort study involved 42 Alzheimer's dementia patients diagnosed based on the NINCDS-ADRDA criteria at Memory Clinic of RSUP dr. Sardjito, Yogyakarta. Data were obtained from medical records, including demographic characteristics, hematological parameters used to calculate the SII and PLR, as well as cognitive function scores assessed using the MoCA-INA. Data analysis was performed using normality tests and correlation analysis with SPSS ver.25 (IBM).

Results: Spearman's correlation analysis revealed significant negative associations between SII and MoCA-INA scores ($r = –0.526$, 95% CI [–0.717 to –0.263], $p < 0.001$) as well as between PLR and MoCA-INA scores ($r = –0.526$, 95% CI [–0.717 to –0.263], $p < 0.001$).

Conclusion: The findings of this study suggest that higher levels of Systemic Immune-Inflammation Index (SII) and Platelet-Lymphocyte Ratio (PLR) are significantly associated with lower MoCA-INA scores in Alzheimer's dementia patients. These results indicate that SII and PLR may serve as potential non-invasive peripheral biomarkers for cognitive impairment in individuals with Alzheimer's dementia.

Keywords: Alzheimer's dementia, cognitive impairment, Montreal Cognitive Assessment, systemic immune-inflammation index, platelet-lymphocyte ratio, inflammatory biomarkers

FROM PLATE TO PERFORMANCE: HOW THE MEDITERRANEAN DIET SUPPORTS COGNITIVE FUNCTION IN ADULTS — A SYSTEMATIC REVIEW OF RCTS

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Background: The Mediterranean diet (MD) has gained attention for its potential on heart and brain health, yet its specific impact on cognitive function in adults is still being actively studied. Understanding whether this dietary pattern can preserve or enhance cognitive abilities in individuals with normal cognitive function is vital for preventive health strategies.

Objective: This systematic review aims to evaluate the impact of MD adherence on cognitive performance, brain health, and related metabolic outcomes in individuals with normal cognitive function.

Methods: Five RCTs published within the past decade were selected from PubMed, ProQuest, EBSCO, Sage, and Wiley databases. The studies involved adults aged 45 years and above, with normal cognitive function, who received MD interventions and were assessed for cognitive and/or cardiometabolic outcomes.

Results: Evidence suggests that following a MD may improve overall cognitive performance and memory, especially with sustained adherence or when combined with other healthy lifestyle changes. Some studies reported enhancements in specific cognitive domains, such as memory and executive function, and positive shifts in eating and physical activity behaviors. While changes in brain imaging and structural markers were generally minimal, certain biological markers and measures of cerebral blood flow showed favorable trends. Cardiometabolic outcomes, such as body weight and blood pressure variability, also improved in some studies, supporting the broader health benefits of the MD. However, results varied across studies and not all cognitive or health measures showed significant differences compared to control diets.

Conclusion: The MD shows promise in supporting cognitive health and metabolic well-being in adults with normal cognitive function. While the most consistent benefits were observed in cognitive performance and certain metabolic markers, further research with standardized methodologies and longer follow-up is needed. Encouraging MD adoption, alongside other healthy lifestyle practices, may be a valuable strategy for maintaining brain health across the lifespan.

Keywords: Mediterranean diet, cognitive function, adults, brain health, systematic review

THE RELATIONSHIP BETWEEN INTERLEUKIN-6 LEVELS AND MEMORY FUNCTION IN ISCHEMIC STROKE

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Background: Stroke is a leading cause of disability and mortality worldwide. The inflammatory response, with Interleukin-6 (IL-6) as a key mediator, plays a crucial role in the pathophysiology of stroke and has been associated with poor clinical outcomes. Cognitive impairment is a common consequence following stroke; however, the specific relationship between IL-6 levels and the degree of cognitive dysfunction, as assessed by the Montreal Cognitive Assessment (MoCA), remains insufficiently explored.

Objective: This study aimed to analyze the relationship between serum IL-6 levels and total MoCA scores in patients following ischemic stroke.

Methods: An analytical observational study with a cross-sectional design was conducted at Wahidin Sudirohusodo Hospital, Makassar. A total of 30 ischemic stroke patients who met the inclusion criteria were enrolled. Serum IL-6 levels and cognitive function (assessed using MoCA). Statistical analysis was performed using Spearman's correlation test to evaluate the association between IL-6 levels and MoCA scores.

Result: The mean age of the participants was 59.37 ± 9.75 years, with 56.7% being male. The mean serum IL-6 level was 5.57 ± 6.59 pg/mL. The average initial MoCA score (MoCA_1) was 15.30 ± 7.60, while the mean MoCA score at day 30 or follow-up assessment (MoCA_30) was 15.60 ± 7.73. Spearman's correlation analysis revealed no statistically significant association between serum IL-6 levels and MoCA_1 scores ($r = −0.265$; $p = 0.157$), MoCA_30 scores ($r = −0.275$; $p = 0.141$), or the change in MoCA scores (MoCA_Delta; $r = 0.029$; $p = 0.879$).

Conclusion: In this study sample, correlation analysis did not demonstrate a statistically significant association between serum IL-6 levels and cognitive function, as measured by the MoCA, in ischemic stroke patients. Further research with larger sample sizes and that account for potential confounding factors is needed to clarify the role of IL-6 in post-stroke cognitive function.

Keywords: Interleukin-6, Ischemic Stroke, Cognitive Function, Montreal Cognitive Assessment (MoCA), Inflammation.RR05. Neuro-Behaviour

VALIDITY OF FAST COGNITIVE EVALUATION TEST AS RAPID COGNITIVE SCREENING TOOL IN DEMENTIA

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Background: Early detection of cognitive impairment is critical for dementia diagnosis and management. Comprehensive neuropsychological tests are often impractical in clinical settings due to their time-consuming nature. Fast Cognitive Evaluation (FaCE) test is brief structured tool that offers potential solution for rapid cognitive screening, but its use in dementia remain unvalidated.

Objective: To evaluate the validity and internal consistency reliability of FaCE test as rapid cognitive screening instrument for dementia.

Methods: A cross-sectional study was conducted with 40 participants (20 dementia patients and 20 healthy controls). Construct validity was analyzed using confirmatory factor analysis (CFA), reliability was measured via Cronbach's alpha (α) and discriminative validity through group comparison.

Result: All FaCE test items showed moderate to strong validity, with correlation coefficients ($r > 0.4$ ($p < 0.01$). Confirmatory factor analysis showed acceptable construct validity, with variance explained exceeding

50% for all items, indicating FaCE had acceptable construct validity as rapid cognitive screening instrument in individuals with dementia. Internal consistency was high (α = 0.796), supporting the tool's reliability. Discriminative validity was confirmed by significantly lower FaCE test scores in dementia patients compared to healthy controls (mean = 22.4% vs 42.7%; $p < 0.001$), indicating excellent discriminative validity. FaCE score below 9.5 can be used to predict dementia with 75.0% sensitivity and 95.0% specificity.

Conclusion: FaCE test exhibits strong reliability and discriminative validity as rapid cognitive screening tool for dementia. Its brevity and psychometric robustness make it promising for clinical use.

Keywords: FaCE test, dementia, cognitive screening

THE RELATIONSHIP BETWEEN DEMOGRAPHIC FACTORS AND NEUROPSYCHIATRIC SYMPTOMS IN ALZHEIMER'S AND MIXED DEMENTIA: AN OBSERVATIONAL STUDY

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Background: Alzheimer's dementia (AD) is the most common type of dementia, characterized by a complex and multifactorial etiology with a steadily increasing incidence. This is accompanied by a high prevalence of neuropsychiatric symptoms (NPS) during the progression of AD and mixed dementia, posing significant challenges for families and treatment management.

Objective: This study aims to examine the relationship between demographic factors and NPS in Alzheimer's and mixed dementia.

Methods: A cross-sectional observational study was conducted at the Memory Clinic of Prof. Dr. R.D. Kandou Hospital, Manado, from January 1, 2023, to December 31, 2024, involving AD and mixed dementia patients. Dementia classification was based on the Hachinski score. Cognitive assessment was conducted using the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA) and neuropsychiatric symptoms were evaluated using the Depression, Anxiety, and Stress Scale (DASS) and Geriatric Depression Scale (GDS).

Results: A total of 63 subjects met the inclusion and exclusion criteria, with an average age of 68.17 years (SD ± 8.873). Age was significantly associated with both dementia types and NPS. Increasing age is associated with lower GDS scores. Occupation and education levels were also significantly related to behavioural and psychological symptoms of dementia (BPSD), while comorbidities showed no significant association with NPS.
Conclusion: Age is strongly correlated with the occurrence of both Alzheimer's and mixed dementia and their associated neuropsychiatric symptoms. However, comorbidities—despite contributing to the progression of dementia—do not demonstrate a significant association with the occurrence of NPS.

Keywords: Neuropsychiatric, Alzheimer, Dementia

LAVENDER OIL AROMATHERAPY AS A TREATMENT OF BEHAVIORAL AND PHYSIOLOGICAL SYMPTOMS OF DEMENTIA: A SYSTEMATIC REVIEW AND META ANALYSIS

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Background: Behavioral and psychological symptoms of dementia (BPSD) encompass various symptoms that impose significant burdens on both nursing home residents and their caregivers and present considerable management challenges. Aromatherapy has proven effective in treating BPSD in several trials, particularly with lavender due to its soothing properties. We conducted a systematic review and meta-analysis to evaluate the effectiveness of aromatherapy in alleviating BPSD and enhancing functional abilities in individuals with dementia.

Methods: A literature search was performed using PubMed, Embase, and Cochrane Library for RCTs published prior to May 2025 that compared lavender aromatherapy with control treatments in patients diagnosed with dementia. We evaluated the primary outcome using the NPI score, the CMAI, and the PAS.

Results: This meta-analysis included eight studies. A single study assessed the effect of the intervention on physical aggression using PAS, the mean difference between the treatment and placebo groups was –1.00 (95% CI: –2.04 to 0.04, p = 0.06). Three studies evaluated the effect of the intervention on agitation using the CMAI, the pooled mean difference of 3.49 (95% CI: –7.18 to 14.15, p = 0.52), indicating no statistically significant difference between groups. Contrary to two other outcomes, the NPI was significantly reduced in the treatment with lavender oil as shown in four studies. The pooled analysis demonstrated a statistically significant mean difference of –4.67 (95% CI: –8.00 to –1.33, p = 0.006).

Conclusion: Lavender oil as aromatherapy is effective nonpharmacologic treatment to improve BPSD in people with dementia compared to placebo or other treatment when measured by the NPI score.

Keywords: BPSD, Dementia, Lavender, Aromatherapy

ASSOCIATIONS OF MEDIAL TEMPORAL LOBE ATROPHY WITH CEREBROSPINAL FLUID Aβ-42 AND NEUROPSYCHIATRIC SYMPTOMS IN ALZHEIMER'S DISEASE: A CROSS-SECTIONAL STUDY OF 2 MAJOR HOSPITALS IN INDONESIA

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Background: Alzheimer's disease (AD) is a neurological disease responsible for most dementia. A promising diagnostic tool for AD, positron emission tomography (PET) scan, wasn't widely available in Indonesia. Cerebrospinal fluid (CSF) biomarker analysis, an invasive procedure, was the last option. Medial temporal lobe atrophy is an associated finding in the dementia spectrum and has potential to be an adjunctive diagnostic tool, especially in countries with limited resources. Neuropsychiatric symptoms (NPS) are also frequently found in AD with significant contribution to AD progression and need early screening.

Objective: To find the association of Medial Temporal-lobe Atrophy (MTA) score with CSF AD biomarkers and NPS.

Methods: A cross-sectional study was conducted in Sardjito General Hospital, Yogyakarta and Cipto Mangunkusumo Hospital, Jakarta, Indonesia. Twenty AD patients aged >60 years old without any intracranial pathologies were included. Several imaging scores were measured using volumetric brain magnetic resonance imaging (MRI). Cerebrospinal fluid Aβ-42 and pTau-181 were measured using enzyme-linked immunosorbent assay (ELISA) kit. NPS was observed using Neuropsychiatric Inventory (NPI) Score.

Results: Cerebrospinal fluid Aβ-42, NPI, and MTA scores showed significant differences among different AD severity, based on clinical dementia rating (CDR) scale. Spearman correlation showed that MTA score was moderately correlated with CDR-sum of boxes (r=0.48, p=0.03), Montreal Cognitive Assessment (MoCA) score (r=-0.59; p<0.01), and CSF Aβ-42 (r=-0.59; p<0.01). Post-hoc LSD ANOVA analysis also showed significant mean difference (MD) between CSF Aβ-42 across MTA scores 1 and 2 (MD=490; p=0.01) as well as NPI (MD=10; p=0.03).

Conclusion: Medial temporal lobe atrophy as a single neuroimaging marker is associated with CSF Aβ-42 and NPS in AD. Thus, medial temporal lobe atrophy could be an adjunctive diagnostic tool and predictor for NPS in AD.

Keywords: medial temporal lobe, imaging, CSF Aβ-42, neuropsychiatric symptoms

BLOOD, BRAIN, AND BIOMARKERS: A PILOT STUDY ON THE ASSOCIATION OF HYPERTENSION AND DIABETES MELLITUS WITH ALZHEIMER'S BIOMARKER IN INDONESIA

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Background: Alzheimer's disease (AD) is marked by amyloid-β (Aβ) plaque accumulation in the brain, reflected by reduced Aβ42 levels in cerebrospinal fluid (CSF). Blood-based Aβ testing is increasingly explored for AD diagnosis. Hypertension and diabetes mellitus are known as AD risk factors and may influence Aβ pathology, though findings remain inconsistent.

Objective: To explore the association between hypertension and diabetes mellitus with Aβ42 levels in CSF and plasma in AD patients in Indonesia. **Methods:** A cross-sectional study, 35 AD patients was conducted. CSF Aβ42 levels were measured using ELISA, and plasma Aβ42 levels using a highly specific ultrasensitive assay. Participants were categorized based on hypertension and diabetes status. Mann–Whitney U tests were used for non-parametric comparisons ($p < 0.05$ significant).

Results: Of the participants, 48.6% were female, mean age of 62.6 ± 12 years. CSF Aβ42 levels were significantly lower in hypertensive patients compared to the non-hypertensive group ($U = 176.5$, $p = 0.018$). Plasma Aβ42 levels were not significantly different between groups ($U = 90.5$, $p = 0.298$). No statistically significant differences were observed in CSF Aβ42 levels ($U = 96.0$, $p = 0.951$) and plasma Aβ42 levels ($U = 131.0$, $p = 0.180$) between diabetic and non-diabetic groups, although diabetic individuals showed slightly lower CSF and higher plasma Aβ42 levels.

Conclusion: Hypertension was associated with reduced CSF Aβ42 levels, suggesting a potential role in Aβ pathology and a vascular risk factor for AD. Although diabetic patients showed lower CSF Aβ42 (consistent with previous findings), but it is not statistically significant. Interestingly, plasma Aβ42 levels were higher in diabetics, which could reflect increased peripheral production or clearance. Plasma Aβ42 levels did not significantly different, indicating CSF biomarkers may better reflect central nervous system changes. Larger, longitudinal studies with multi-modal approaches are needed to clarify these associations.

Keywords: CSF Aβ42, Plasma Aβ42, Hypertension, Diabetes Mellitus

VALIDITY OF FAST COGNITIVE EVALUATION TEST AS RAPID COGNITIVE SCREENING TOOL IN DEMENTIA

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Background: Early detection of cognitive impairment is critical for dementia diagnosis and management. Comprehensive neuropsychological tests are often impractical in clinical settings due to their time-consuming nature. Fast Cognitive Evaluation (FaCE) test is brief structured tool that offers potential solution for rapid cognitive screening, but its use in dementia remain unvalidated.

Objective: To evaluate the validity and internal consistency reliability of FaCE test as rapid cognitive screening instrument for dementia.

Methods: A cross-sectional study was conducted with 40 participants (20 dementia patients and 20 healthy controls). Construct validity was analyzed using confirmatory factor analysis (CFA), reliability was measured via Cronbach's alpha (α) and discriminative validity through group comparison.

Result: All FaCE test items showed moderate to strong validity, with correlation coefficients (r) > 0.4 ($p < 0.01$). Confirmatory factor analysis showed acceptable construct validity, with variance explained exceeding 50% for all items, indicating FaCE had acceptable construct validity as rapid cognitive screening instrument in individuals with dementia. Internal consistency was high (α = 0.796), supporting the tool's reliability. Discriminative validity was confirmed by significantly lower FaCE test scores in dementia patients compared to healthy controls (mean = 22.4% vs 42.7%; $p < 0.001$), indicating excellent discriminative validity. FaCE score below 9.5 can be used to predict dementia with 75.0% sensitivity and 95.0% specificity.

Conclusion: FaCE test exhibits strong reliability and discriminative validity as rapid cognitive screening tool for dementia. Its brevity and psychometric robustness make it promising for clinical use.

Keywords: FaCE test, dementia, cognitive screening

COGNITIVE PROFILES OF QURAN READERS VISITING THE NEUROLOGY CLINIC AT DR. SAIFUL ANWAR GENERAL HOSPITAL

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Background: Cognitive impairment is a prevalent issue among the elderly, with its incidence increasing with age. Early detection and management are crucial in mitigating its progression and preserving cognitive functions. Religious practices, particularly Quran recitation and memorization, may play a role in cognitive stimulation and emotional well-being, yet limited studies have explored this association in clinical populations.

Objective: This study aimed to describe the cognitive profile of patients who read the Quran and visited the Neurology Clinic at Dr. Saiful Anwar General Hospital in Malang, Indonesia.

Methods: This descriptive observational study involved interviews with 60 patients who visited the Neurology Clinic and met the inclusion criteria. Cognitive function was assessed using the Indonesian version of the Montreal Cognitive Assessment (MOCA-INA). Data on Quran reading habits, including frequency and duration, were collected using a structured questionnaire. Descriptive statistical analysis was used to present the data distribution by age, education, Quran reading behavior, and cognitive status.

Results: The average age of participants was 49.42 years (SD: 15.02). Most patients had completed high school (50%) or higher education (33%). Regarding Quran reading frequency, 23% read daily, while 45% read irregularly. About 36% had read the Quran for over five years. MOCA-INA scores revealed that 52% of patients had cognitive impairment. Those with normal cognition generally had higher education levels and more frequent, long-term Quran reading habits, while those with impairment tended to read less frequently and for shorter durations.

Conclusion: Regular and long-term Quran reading may be associated with better cognitive function. Cognitive outcomes also appear to correlate with educational background and age. These findings suggest that Quran reading could be a beneficial component in cognitive rehabilitation strategies.

Keywords: cognitive impairment, Quran reading, MOCA-INA, elderly, neurology clinic, cognitive function

ASIA'S LEADING ROLE IN THE DEVELOPMENT OF NEUROPROTECTIVE AGENTS: A BIBLIOMETRIC ANALYSIS OF RECENT STUDIES

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Introduction: Neuroprotectants are agents designed to protect nerve cells from damage or degeneration caused by various conditions. These agents function to slow, stop, or even repair damage to the nervous system. Consequently, the development of neuroprotective agents is an active area of research worldwide.

Learning Objective: This bibliometric study aimed to systematically analyze and synthesize existing literature on the development and recent progress of neuroprotective agents.

Methods: The inclusion criterion for this analysis was original articles published in English. Non-original materials and studies lacking an explicit connection to neuroplasticity were excluded. VOSviewer software version 1.6.19 was employed for co-occurrence analysis, co-authorship analysis, and visualization.

Results: A total of 1,905 scientific papers from the Scopus database were identified discussing neuroprotective agents over the last five years. These agents have been developed primarily for conditions such as Alzheimer's disease, Parkinson's disease, epilepsy, and stroke. Specifically, 234 articles focused on oxidative stress as a target for neuroprotective agents. Geographically, China (565 articles), India (330 articles), and South Korea (162 articles) were the leading contributors, highlighting the rapid development of neuroprotective agents in Asia. Currently researched natural compounds include polyphenols, scopolamine, flavonoids, and rotenone. Continued development focuses on plant extracts; notably, Centella asiatica, Ginkgo biloba, and Ashwagandha are the most studied plants for neuroprotective potential.

Conclusion: The significant contributions from Asian countries in neuroprotective research signify not only promising scientific advancements but also potential shifts in global health practices. There is an encouraging fusion of traditional and modern medicinal approaches to achieve enhanced therapeutic outcomes.

Keywords: Neuroprotectants, Asia, Centella asiatica, Ginkgo biloba, dan Ashwagandha

RISKS AND BENEFITS OF FLUOXETINE AS AN ADJUVANT THERAPY FOR MOTOR RECOVERY IN POST-STROKE PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Stroke is a major cause of long-term disability, with motor impairments posing significant challenges to recovery. In 2011, fluoxetine, a selective serotonin reuptake inhibitor (SSRI), was reported to improve motor recovery in stroke patients by enhancing neuroplasticity and modulating the serotonergic system. However, its efficacy and safety in post-stroke rehabilitation remain controversial.

Objective: To evaluate the efficacy and safety of fluoxetine in improving motor recovery and health-related quality of life (HRQoL) after stroke.

Methods: This systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. A comprehensive search of PubMed, Scopus, and Google Scholar was performed for randomized controlled trials (RCTs) evaluating the effects of fluoxetine on motor recovery in post-stroke patients, up to March 2025. Data were analyzed using Review Manager 5.1.0. Motor recovery and HRQoL outcomes were reported as standardized mean differences (SMDs) using a random effects model, while adverse events were assessed as odds ratios (ORs) using a fixed effects model. The review was registered with PROSPERO (ID: CRD420251011077).

Results: Out of 1.173 identified studies, 23 RCTs comprising a total of 12.041 post-stroke patients met inclusion criteria. Fluoxetine significantly improved motor recovery (P = 0.01), particularly with a 90-day treatment duration (P = 0.006) at a daily dose of 20 mg (P = 0.05). HRQoL also improved significantly (P = 0.002). However, fluoxetine use was associated with a higher risk of adverse events (P < 0.00001), notably bone fractures (P < 0.00001), seizures (P = 0.009), and hyponatremia (P = 0.007).

Conclusion: Fluoxetine may offer benefits in enhancing motor recovery and HRQoL in post-stroke patients, especially when administered as a 90-day course at 20 mg/day. However, the increased risk of serious adverse events including bone fractures, seizures, and hyponatremia highlights the importance of careful patient selection and monitoring during treatment.

Keywords: Fluoxetine, post-stroke, motor recovery, health-related quality of life, adverse events

REWIRING THE BRAIN WITH FAT: A SYSTEMATIC REVIEW OF KETOGENIC DIETS IN MULTIPLE SCLEROSIS

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Background: Multiple sclerosis (MS) is a chronic autoimmune disorder characterized by demyelination and neurodegeneration of the central nervous system. Fatigue, impaired physical function, and reduced quality of life are common in MS patients. Recently, dietary interventions, particularly the ketogenic diet (KD), have emerged as potential adjunct therapies for symptom management.

Objective: This systematic review aims to evaluate the effects of KD on clinical and patient-reported outcomes in individuals with MS over the past decade.

Methods: A comprehensive literature search was conducted using PubMed, ProQuest, EBSCO, SAGE, and Wiley databases. Inclusion criteria encompassed peer-reviewed studies published between 2015 and 2025, in English, involving human subjects with MS undergoing ketogenic dietary interventions. Of the 18 initially identified articles, 4 met the inclusion criteria.

Results: The included studies implemented KD or its variations, including modified Atkins, medium-chain triglyceride-based, and paleolithic KDs. Intervention durations ranged from 3 to 12 months. Across studies, significant improvements were observed in fatigue scores (MFIS, FSS), quality of life (MSQoL-54), and mental health outcomes (e.g. depression via BDI). Functional outcomes such as walking endurance (6-minute-walk) and extremity function (9HPT, T25FW) improved in some cohorts. However, no consistent significant changes were seen in disability progression (EDSS) or cognitive metrics (PASAT, SDMT) across all studies. Adherence to the KD was feasible in clinical settings, though challenges with long-term sustainability were noted.

Conclusion: Ketogenic diets may provide clinical and symptomatic benefits for people with MS, notably in reducing fatigue and enhancing quality of life. However, evidence regarding its benefits on neurological disability and cognitive function remains limited. Further large-scale, randomized controlled trials are necessary to establish long-term efficacy and mechanisms of action.

Keywords: Multiple Sclerosis, Ketogenic Diet, Fatigue, Quality of Life, Disability, Systematic Review

THE EFFECTIVENESS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION COMBINED WITH COGNITIVE TRAINING FOR TREATING MILD TO MODERATE ALZHEIMER'S DISEASE

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Background: Our study evaluates the effect of repetitive transcranial magnetic stimulation (rTMS) paired with cognitive training on cognitive function in Alzheimer's disease (AD) patients.

Methods: In addition to standard therapies, ten individuals with mild to severe Alzheimer's disease who were clinically diagnosed using DSM-5 criteria were given rTMS treatment combined with cognitive training. The protocol of rTMS focused on six different brain regions linked to cognitive abilities significantly impacted by AD dementia: Broca's region, the left and right dorsolateral prefrontal cortex, and the left and right inferior parietal lobe. Three chosen areas received a total of 1200 pulses each day at a frequency of 10 Hz, with 20 pulses every train. The intensity of the rTMS was set at 80% of the patient's resting motor threshold. The Mini-Mental State Examination (MMSE), word list recall, immediate recall, Trial-Making Test A, Trial-Making Test B, delayed recall, delayed recognition, digit span forward, digit span backward, and a clock drawing test were among the initial outcome assessments of the study as well as those taken after 30 days of intervention.

Results: In comparison to the baseline, the MMSE score increased statistically significantly (p < 0.05) from 18.20 to 19.40. The median

immediate recall, delayed recall, and delayed recognition scores increased from 9 to 11, 0 to 1, 3 to 5, respectively. In which the immediate recall score improved with statistical significance ($p < 0.05$). There is no change in the other scores.

Conclusion: Repetitive transcranial magnetic stimulation combined with cognitive training is a helpful technique for the cognitive rehabilitation of AD patients.

Keywords: Alzheimer's disease, cognitive function, repetitive transcranial magnetic stimulation, cognitive training

NEUROLOGY TRAINING IN ASEAN COUNTRIES

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Background and Objectives: This study aims to describe the variations in neurology training pathways in all Association of Southeast Asian Nations (ASEAN) countries.

Methods: A cross-sectional survey using questionnaires was conducted among the representatives of ASEAN countries from October 2023 to March 2024.

Results: Neurology training programs are available in 9 of the 11 ASEAN countries, except Timor-Leste and Cambodia. Despite the growing number of neurologists, with a doubling of the neurologist-to-patient ratio in most countries in the past 2 decades, the neurologist density per 100,000 population remained low. Thailand, Singapore, and Brunei Darussalam have more than 1 neurologist per 100,000 population compared with 2007, when only Singapore and Brunei Darussalam had more than this ratio. In Cambodia, Lao People's Democratic Republic (PDR), Myanmar, and Timur Leste, although the number of neurologists has increased substantially, the ratio of neurologists remains low, with less than 1 in a million population in Myanmar, 1:625,000 population in Lao PDR, 1:526,000 population in Cambodia, and 1:430,000 in Timur Leste. The total duration of training from undergraduate to certified neurologist varies greatly because of compulsory internal medicine (IM) training and post-internship services. To enrol in neurology training, candidates in 4 countries (Brunei, Singapore, Malaysia, and Myanmar) must have completed IM as a prerequisite. Candidates from Thailand and Indonesia must fulfil their 2-year compulsory government or general practice service requirement before they are eligible for neurology training. After fulfilling the eligibility criteria to enter neurology training, the overall training duration ranges from 3 to 13 years. Malaysia and Myanmar are countries where candidates spend more than 10 years becoming certified neurologists.

Discussion: The number of neurologists and the neurologist-to-patient ratio have improved since 2007 in ASEAN countries. Diverse neurology curricula and the variable duration to complete neurology training and subspecialty practice are the main challenges in improving neurology training in ASEAN countries.

BENIGN VARIANTS IN ELECTROENCEPHALOGRAPHY

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Background: Benign variants – BVs (Normal variants) on EEG account for 9,9–61% [2] [4] [5] of wake and sleep EEGs and are frequently mistaken for interictal epileptiform discharges; which cause of misdiagnosis and overtreatment. This study aimed to determine the prevalence of each type of BVs and investigate the association between clinical and paraclinical characteristics with each specific BVs.

Methods: This study was performed both retrospective and prospective on 357 EEG recordings of 348 subjects who underwent wake and sleep EEG at Nguyen Tri Phương Hospital and the International Neurosurgery Hospital between April 2022 and October 2024.

Results: The prevalence of overall BVs, wake BVs, and sleep BVs was 49,9%, 14,3%, and 45,3%, respectively. The most common variant was positive occipital sharp transients of sleep (POSTs) (39,5%), followed by Mu rhythm (9%), small sharp spikes (3,9%), rhythmic mid-temporal discharges (RMTD) (3,6%), wicket spikes (2,8%), Lambda waves (2,2%), midline theta rhythm (1,4%), breach rhythm (1,1%), and 14/6 Hz positive bursts (0,8%).

Median age was associated with wake BVs. Absence of structural abnormalities on imaging associated with sleep BVs (OR=1,58). Factors associated with POSTs included female gender (OR=1,91), absence of EEG abnormalities (OR=2,05), no seizures during recording (OR=3,62), no structural abnormalities on imaging (OR=1,62), and no frontal lobe (OR=2,24) or occipital (OR=4,82) lobe lesions on imaging. Median age was significantly associated with Mu rhythm ($p<0,001$).

Conclusion: Normal variants are common on wake and sleep EEG. Routine description of these variants is essential to differentiate them from interictal epileptiform discharges, thereby improving the accuracy of epilepsy diagnosis and treatment.

Abbreviations: BV = benign variants, POSTs = positive occipital sharp transients of sleep.

Keywords: Normal variants, benign variants, electroencephalography - EEG

COMPARATIVE EFFECTIVENESS OF THE EPLEY MANEUVER VERSUS PHARMACOLOGICAL TREATMENT IN BENIGN PAROXYSMAL POSITIONAL VERTIGO (BPPV): A SYSTEMATIC REVIEW

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Background: Benign Paroxysmal Positional Vertigo (BPPV) is a prevalent vestibular disorder characterized by brief episodes of vertigo associated with changes in head position. The Epley maneuver, a canalith repositioning procedure, and pharmacological treatments such as betahistine are commonly employed interventions.

Methods: This systematic review aims to evaluate and compare the effectiveness of the Epley maneuver versus pharmacological therapies in the management of BPPV. A comprehensive literature search was conducted across databases including PubMed and Google Scholar, for 8 clinical studies published between 2020 and 2023 across multiple countries (Iraq, Pakistan, India, China, Brazil, and Turkey). The present study included randomized controlled trials (RCTs) and prospective studies that compared the Epley maneuver with pharmacological treatments in adult patients diagnosed with BPPV. Outcomes of interest included vertigo intensity measured by VAS (Visual Analog Scale), Dizziness Handicap Inventory (DHI), Beck Anxiety Inventory (BAI), and symptom resolution.

Results: The study included a total of 623 participants, with an average age ranging from 32 to 56 years and study durations from one to eight weeks. Subjects were divided into two groups: an intervention group that received the Epley maneuver and a control group that received

pharmacological treatments, such as betahistine, sedatives, or a combination of both. The findings indicate that the Epley maneuver alone provides a promising therapeutic effect. This non-pharmacological intervention effectively resolved vertigo symptoms, including frequency, intensity, and patient balance function, compared to medication only or combined treatments. The medication was clearly effective in reducing scores on the Visual Analog Scale (VAS) and alleviating symptoms such as nausea and vomiting. There was no significant difference in treatment effectiveness in terms of the patient's BAI and DHI.

Conclusion: The Epley maneuver has proven highly effective and should be considered first-line treatment for patients with BPPV.

Keywords: BPPV, Epley maneuver, pharmacological therapy, betahistine

CHARACTERISTICS OF MYASTHENIA GRAVIS (MG) PATIENTS AT Dr. WAHIDIN SUDIROHUSODO CENTRAL GENERAL HOSPITAL

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Background: Myasthenia Gravis (MG) is a chronic autoimmune disease affecting the neuromuscular junction, characterized by fluctuating muscle weakness. The disease can affect all age groups, with peak incidence in young adult women and elderly men. Clinical manifestations vary from ocular symptoms to severe respiratory muscle weakness, potentially leading to myasthenic crisis.

Objective: To determine the characteristics of MG patients at Dr. Wahidin Sudirohusodo Central General Hospital, Makassar.

Methods: This type of research is a retrospective descriptive study using medical record file data. The study population was all patients diagnosed with MG at Dr. Wahidin Sudirohusodo Central General Hospital for the period 2023-2025.

Results: The majority of MG patients were female (65.8%), with the most common age group being 30–50 years (44.7%). Most patients had a secondary education (42.1%) and worked as housewives (31.6%). The most frequent chief complaint was dyspnea (50%), followed by tetraparesis (21.1%). A total of 57.9% of patients had a history of MG, and most were classified as MGFA class IIIb (71.1%). Almost half of the patients had been admitted to the ICU (44.7%), with all patients showing Electromyography (EMG) results supporting MG diagnosis. Thymoma was found in 26.3% of cases. Additional procedures were performed in 15.8% of patients, and 21.1% had comorbidities. Most patients showed clinical improvement (71.1%), while 29% experienced deterioration or death.

Conclusion: The predominance of females in productive age supports the theory of hormonal involvement in MG pathogenesis through activation of thymic germinal centers. The high frequency of dyspnea indicates the risk of myasthenic crisis. Detection of thymoma in a quarter of patients emphasizes the importance of routine radiological screening. Comorbidities such as hypertension, though infrequent, remain relevant due to their potential to worsen prognosis.

Keywords: Myasthenia Gravis, Myasthenic Crisis, Thymoma, Electromyography

EFFICACY OF COMBINATION OF THETA BURST STIMULATION AND BINAURAL BEATS ON UPPER EXTREMITY MOTOR IMPROVEMENT IN SUB-ACUTE ISCHEMIC STROKE

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Background: Upper extremity dysfunction is a common post-stroke issue that limits daily functioning. Advancing neurorehabilitation is essential to improve stroke survivors' quality of life. This study examines the use of Theta Burst Stimulation (TBS) combined with Binaural beats to enhance motor recovery. Theta burst stimulation has been shown to promote prolonged and intense neuronal activation with low-intensity, short-duration stimulation. Binaural beats use auditory differences between the ears to influence brainwave activity and support neural balance. These modalities work together to potentially optimize rehabilitation outcomes. However, to date, few studies have evaluated the combined use of Theta burst stimulation and binaural beats in post-stroke patients. This study seeks to address that gap and advance the development of more effective neurorehabilitation approaches.

Objective: To evaluate the efficacy of combining Theta Burst Stimulation and Binaural beats on upper limb motor function in stroke patients.

Methods: This pre-experimental study used a pretest-posttest design without a control group. Ten patients with ischemic stroke and upper limb motor weakness participated. All received both Theta burst stimulation and binaural beats therapy. Motor function was assessed using the Fugl-Meyer Assessment for Upper Extremity (FMA-UE) before and after intervention.

Results: The Wilcoxon Signed-Rank Test showed significant improvement in motor function post-intervention. Of the 10 patients, 9 demonstrated increased FMA-UE scores, 1 showed no change, and none worsened. The statistical test yielded a significant result ($Z = -2.670$, $p = 0.008$), indicating the intervention was effective.

Conclusion: This study shows the efficacy of the combination of Theta Burst Stimulation (TBS) and Binaural beats therapy on improving upper extremity motor function in stroke patients.

Keywords: Theta Burst Stimulation, Bineural beats, Upper Extremity, Stroke Ischemic Acute

RELATIONSHIP OF ELECTROENCEPHALOGRAPHY PATTERN IN PATIENTS WITH PRIMARY BRAIN TUMOR IN DR. KARIADI HOSPITAL SEMARANG

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Background: Electroencephalogram (EEG) is considered an important tool used in brain tumor detection, by measuring electrical activity in the brain. EEG can generally detect meningiomas and gliomas which are the most common types of primary brain tumors.

Aim: Investigating the relationship between electroencephalography (EEG) findings and the features of primary brain tumors.

Methods: We performed a cross-sectional study in patients with primary brain tumors at Kariadi General Hospital, Semarang, between April 2024 and April 2025. A total of 38 samples in this study were taken based on the inclusion and exclusion criteria. EEG recording was performed for approximately 40 minutes. Data collected from medical record, including demographic characteristic, primary brain tumor obtained from histopathological result, EEG examination performed in patient with history of seizure or headache. Data were analyzed using SPSS program including univariate and bivariate analysis with a significance level set at $p < 0.05$. This study has received ethical approval from Dr. Kariadi Hospital Semarang.

Results: We collected data from 38 subjects with primary brain tumors. The mean age was 47.16 years old with 68.4% females. The most common symptoms were headache. No significant correlation was found between EEG abnormalities and the degree of tumor malignancy ($p = 0.393$). In the high-grade tumor group ($n = 4$), 50% exhibited low voltage EEG, 25% slow waves, and 25% normal patterns, with no epileptiform activity. In the low-grade tumor group ($n = 34$), 58.8% showed slow waves, followed by low voltage (20.6%), normal (14.7%), and epileptiform (5.9%) patterns.

Conclusion: There is no statistically significant difference between the degree of malignancy of brain tumors on various EEG parameters

Keyword: Electroencephalogram, brain tumor, central nervous system tumor

COMPARISON OF QUANTITATIVE ELECTROENCEPHALOGRAPHY (QEEG) ACTIVITY IN INSOMNIA PATIENTS WITH BINAURAL BEATS THERAPY AND WITHOUT BINAURAL BEATS THERAPY

Nur Qalbi Ramadhani, Ummu Atiah

Background: Insomnia is the most common and disruptive sleep-wake disorder. Insomnia causes patients to have trouble falling or staying

asleep. According to reports, binaural beats (BB) can improve memory and arousal, which lowers anxiety and regulates mood. If people with sleep disturbances listen to the BB of the theta wave and the entrainment effect occurs, the low-frequency brain wave will increase and the high frequency brain wave will decrease.

Objective: To compare the quantitative EEG (QEEG) activity in insomnia patients with binaural beats therapy and without binaural beats therapy.

Methods: This study employs an analytical observational research design with a comparative retrospective approach using existing data for QEEG results before and after alpha binaural beat stimulation therapy in insomnia patients, as well as QEEG results from insomnia patients who did not receive therapy. The therapy group (n=10) received binaural beat audio stimulation daily for 10 days and underwent QEEG assessment before and after therapy. The control group (n=10) underwent only a single pre-test QEEG without receiving any intervention. Statistical analysis was performed using the Friedman Test for within-group comparisons in the therapy group and the Mann–Whitney U test for between-group comparisons therapy group and control therapy with significance level of $p < 0,05$.

Result: In the therapy group, QEEG analysis showed a significant increase in delta wave, theta wave, and alpha wave activity, and a decrease in beta wave activity after the intervention ($p<0,05$). These changes are associated with improved relaxation and reduced cortical arousal, supporting better sleep.

Conclusion: Binaural beat therapy in measurable changes in brainwave activity, indicating its potential effectiveness in promoting sleep-related neurophysiological changes in insomnia patients. However, further research with a larger sampel size and repeated measurements in the control group is needed to strenghten these finding.

Keywords: Insomnia, QEEG, Binaural Beat

OBJECTIVE SLEEP CHARACTERISTICS ON ACTIGRAPHY IN 19 YOUNG ADULT PATIENTS WITH EXCESSIVE DAYTIME SLEEPINESS

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Background: Actigraphy is an FDA-approved method for the objective assessment of sleep–wake patterns, with validated algorithms allowing the conversion of motor activity into corresponding wake–sleep states. Excessive daytime sleepiness (EDS) is a common complaint among young adults presenting to sleep centers. To assess potential causes of EDS (e.g., insomnia, circadian rhythm sleep–wake disorders, insufficient sleep, or poor sleep quality), beyond subjective measures such as sleep diaries and self-reported questionnaires, actigraphy provides complementary data to characterize sleep objectively and guide further diagnostic approaches.

Objectives: To analyze objective sleep parameters using actigraphy in young adult patients with symptoms of excessive daytime sleepiness.

Methods: This descriptive study included 19 patients aged 18–35 years presenting with EDS, defined by an Epworth Sleepiness Scale (ESS) score ≥11. Each participant wore a wrist actimeter (MotionWatch 8, CamNtech) continuously for 14 days in their habitual environment. Parameters on the actigraphy were categorized into three domains: sleep timing, sleep quality, and circadian rhythm stability.

Results: Sleep duration: 78.94% (15/19) of patients had an average nightly sleep duration ≥7 hours. Sleep quality: Although 15/19 patients had normal sleep onset latency, 13/19 (68.42%) exhibited ≥3 awakenings per night, and 15/19 had wake after sleep onset (WASO) >90 minutes—indicative of poor sleep continuity or fragmented sleep. Circadian rhythm: 47.39% (9/19) had an interdaily stability (IS) index <0.5, suggesting poor sleep–wake rhythm between days. Overall, actigraphy data revealed that 6/19 patients had fragmented sleep, 3/19 had unstable circadian rhythms, and 7/19 exhibited both abnormalities.

Conclusion: Actigraphy offers valuable objective insight into sleep patterns in young adults with EDS. This tool facilitates the identification of underlying contributors such as sleep fragmentation and circadian instability.

Keywords: actigraphy, excessive daytime sleepiness

SLEEP QUALITY IN POST-TUBERCULOUS MENINGITIS PATIENTS

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Background: Tuberculous meningitis (TBM) often manifests sequelae in survivors, including sleep disturbances. This study aims to evaluate the frequency of poor sleep quality and its correlation with the clinical presentation and patient characteristics in post-TBM patients.

Objective: We conducted a cross-sectional analytic study involving post-TBM patients from the Indonesian Brain Infection Study (IBIS) cohort. Patients were contacted at least six months after treatment to complete the Pittsburgh Sleep Quality Index (PSQI), sleep quality is categorized as poor (≥ 5) and good (< 5). PSQI scores were obtained using a self-assessment questionnaire via direct or telephone interviews and matched with clinical data from the IBIS case report form.

Results: Out of 160 post-TBM patients, 82 responded. Nearly half (48.8%) reported poor sleep quality, with significant issues in sleep latency, duration, and efficiency. The poor sleep quality group took longer to fall asleep (median: 30 minutes vs. 15 minutes, $p = < 0.001$), experienced more daytime sleepiness, and had lower sleep efficiency (median: 100% vs. 83.3%, $p = < 0.001$). Elevated CSF protein levels showed a correlation with PSQI score ($\rho = -0.262$; $p = 0.019$). Other clinical parameters and patient characteristics did not show significant correlations with sleep quality.

Conclusion: Nearly half of post-TBM patients reported poor sleep quality, characterized by delayed sleep onset, reduced duration, and lower efficiency. Its association with elevated CSF protein—but not other clinical parameters—may reflect ongoing neuroinflammation or subclinical brain injury. These findings highlight the need for routine sleep assessment and consideration of sleep-targeted interventions in post-TBM care.

PAIN SCALE IN CHRONIC LOW BACK PAIN PATIENTS BEFORE AND AFTER CORTICOSTEROID INJECTION AT REGIONAL PUBLIC HOSPITAL AMALIAH, BONTANG CITY

Dwi Rahmad Setiawan, Abdul Muis

Background: Low Back Pain (LBP) is a public and occupational health problem that is a major professional, economic and social burden. Up to 84% of the general population will experience an episode of LBP during its life time, and recurrence rates are high. LBP can categorized as acute (less than 2 to 4 weeks), subacute (4-12 weeks), and chronic (more than 12 weeks). Epidural steroid injections are a common treatment option for various forms of Low Back Pain. Steroids are typically administered as anti-inflammatory agents. Inflammation is common component of many low back pain conditions. By reducing inflammation, pain may also alleviated.

Objective: This study aims to determine the change in pain scale in patients with chronic lower back pain before and after corticosteroid injection at RSUD Amaliah Bontang City.

Methods: This is a descriptive study conducted from July to August 2024, involving 36 patients. The study variables included age, gender, occupation, and pain scale. The data were processed and presented in the form of frequency distribution tables accompanied by discussion.

Result: Among the 36 patients with low back pain, the average age was 50.9±11.8 years, with 24 females (67%) and 12 males (33%). About 25% of the patients were farmers and self-employed individuals. The median numerical pain scale before and after the steroid injection was 7 and 3, respectively.

Disscussion: Epidural steroid injections deliver medication directly (or very close) to the source of the pain. Epidural steroid injection is considered a simple, effective, and minimally invasive treatment modality for chronic low back pain.

Keywords: Chronic Low Back Pain, Epidural Steroid Injection

THE EFFECTIVENESS OF NEUROMUSCULAR TAPING ON PAIN REDUCTION IN PATIENTS WITH NON-SPECIFIC LOW BACK PAIN USING THE NUMERICAL PAIN RATING SCALE (NPRS): QUASI EXPERIMENTAL

Rahima Bugis, Jumraini Tamasse

Background: Non-specific low back pain (NSLBP) is one of the most commonly encountered musculoskeletal complaints in neurology practice. One of the growing non-pharmacological therapeutic approaches is Neuromuscular Taping (NMT), which works through gate control mechanisms and increased local blood flow to reduce pain perception.

Objective: This study aims to evaluate the effectiveness of NMT in reducing pain intensity based on the Numeric Pain Rating Scale (NPRS).

Methods: The research design used was a quasi-experimental one group pre-post test, involving 30 participants (9 males (30%), (21 females (70%) with an average age of 38.2 ± 12.5 years (range 16-60 years). NMT intervention was conducted for two weeks, with measurements of pain levels before and after therapy.

Result: The results of the paired t-test analysis showed a significant decrease in pain scores, from a mean of 6.8 ± 1.2 (moderate to severe pain category) to 3.1 ± 1.5 (mild pain category), with a mean difference of 3.7 points and a p value <0.001. This 54.4% reduction reinforces the effectiveness of NMT as a non-invasive therapy for managing NSLBP.

Conclusion: Neuromuscular Taping is proven to be effective in significantly reducing pain intensity in NSLBP patients. These findings support the integration of NMT as a non-invasive modality in clinical pain management. Further studies with control groups and longer follow-up periods are recommended to validate sustained effects.

Keywords: Neuromuscular Taping, non-specific low back pain, NPRS, quasi-experimental, pain therapy

THE DESCRIPTION OF NECK PAIN INCIDENCE IN OFFICE WORKERS AT AERAMO HOSPITAL IN DISTRICT NAGEKEO

Aslan Tonapa, Audry Devisanty Wuysang

Background: *Neck pain* is pain associated with posture, sleeping habits, work position, stress, chronic muscle fatigue, degenerative changes of the cervical disc. Neck pain can reduce neck joint movement and functional neck activity so that it can interfere with a person's activities. *Neck pain* cases in Indonesia increase every year by 16%, especially in adults and occur due to static work such as office workers. One of the impacts that occurs is discomfort while working, stiffness in the neck and dizziness in the head.

Objective: This study aims to determine the incidence of *neck pain* in office workers at Aeramo Hospital, Nagekeo Regency.

Methods: This study used a descriptive methods with a cross sectional approach, the population amounted to 320 workers with a sample of 40 respondents using random sampling techniques.

Results: The test results showed that office workers who experienced *neck pain* were most dominated by moderate pain in 21 office workers with a percentage (52.5%), with female gender as many as 22 workers (55%), and the most age in the age category 31-40 years (50%).

Conclusion: The description of the incidence of neck pain in office workers at Aeramo Hospital, Nagekeo Regency is high, with most experiencing neck pain due to less ergonomic work posture factors and long duration of computer use without rest.

Keywords: *Neck Pain*, Office Workers, Working Position

QUANTITATIVE ELECTROENCEPHALOGRAPHY OF EPILEPSY PATIENTS AT WAHIDIN SUDIROHUSODO HOSPITAL: A DESCRIPTIVE STUDY

Vieryna Widyatuti Soemarno, Audry Devisanty Wuysang

Background: Epilepsy is a chronic neurological disorder characterized by recurrent seizures due to abnormal brain electrical activity. While conventional EEG is fundamental for epilepsy diagnosis, its reliance on visual inspection can be time-consuming and may miss subtle abnormalities, particularly interictally. This has led to growing interest in quantitative electroencephalography (QEEG), which uses digital signal processing to measure features like power spectral density, coherence, and entropy. QEEG offers a more objective assessment by detecting statistical deviations from baseline data, identifying frequency-specific abnormalities, and assessing changes in brain connectivity. It may also predict seizures by monitoring dynamic shifts in brain activity.

Objective: To obtain an overview of QEEG wave dominance in epilepsy patients.

Methods: This descriptive observational study involved epilepsy patients diagnosed by clinical symptoms and EEG during wakefulness, treated at Dr. Wahidin Sudirohusodo Central General Hospital, with subjects selected by total sampling.

Result: This study included 38 patients, with a slight female predominance (52.6%) and most aged 19–44 years (76.3%). Generalized seizures were more common (68.4%) than focal seizures (31.6%). Conventional EEG was abnormal in 63.2% of cases, with “Abnormal III” being the most frequent pattern (39.5%). QEEG revealed distinct patterns: focal seizures showed localized abnormalities in the temporal and frontal regions, while generalized seizures caused widespread bilateral disruptions, particularly in the delta and theta bands. In almost all conventional EEG groups, QEEG consistently showed increased delta and theta activity and decreased alpha activity. All patients (100%) demonstrated abnormal absolute power in alpha, delta, and theta bands, indicating global brain rhythm disruption. Relative power abnormalities exhibited distinct variations among the conventional EEG groups. Notably, QEEG detected abnormalities even in patients with normal conventional EEG, highlighting its greater sensitivity in identifying subtle cortical dysfunction.

Conclusion: These results emphasize QEEG’s effectiveness in identifying diffuse and heterogeneous electrophysiological disturbances.

Keywords: Delta Bands, Epilepsy, Quantitative Electroencephalography, Theta Bands

COMPARISON OF ACTIVITY DAILY LIVE AND PAIN EFFECTIVENESS IN HERNIA NUCELUS PULPOSUS PATIENTS POST RADIO FREQUENCY ABLATION AND PHYSIOTHERAPY WITH POST LAMINECTOMY AND PHYSIOTHERAPY

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Background: Low back pain is a condition that often brings patients to the doctor. Low back pain has a wide range of diagnoses, one of the most common low back pain is Herniated Nucleus Pulposus (HNP). Herniated Nucleus Pulposus can make patients tend to avoid physical activity or daily activities that are usually done to reduce the pain that occurs and can reduce a person's quality of life. Some of the therapeutic modalities can be Radio Frequency Ablation (RFA) or Laminectomy. Physiotherapy is also done to familiarize a person in doing activities.

Objective: To explain the difference in activity daily live of Herniated Nucleus Pulposus post Radio Frequency Ablation patients and Physiotherapy and Herniated Nucleus Pulposus post Laminectomy patients and Physiotherapy, and to analyze the pain scale in Herniated Nucleus Pulposus post Radio Frequency Ablation patients and Herniated Nucleus Pulposus post Laminectomy patients.

Methods: Data were collected by asking patients using the Oswestry Disability Index (ODI) questionnaire to assess disability and Numeric Rating Scale (NRS) for pain effectiveness. Data were collected from patients with Herniated Nucleus Pulposus who had undergone Radio Frequency Ablation or Laminectomy and Physiotherapy in 2024 at dr. Kariadi Hospital Semarang. The data will then be processed using SPSS application.

Results: Disability assessment with Oswestry Disability Index using Mann-Whitney test obtained p value = 0.897 (p> 0.05), pain effectiveness assessment with Numeric Rating Scale using Fisher's Exact test obtained p value = 0.565 (p> 0.05).

Conclusion: Obtained for both p values > 0.05, it can be concluded that there is no significant difference between RFA or Laminectomy therapy with physiotherapy.

Keywords: Herniated Nucleus Pulposus, Radio Frequency Ablation, Laminectomy, Physiotherapy, Disability, Pain effectiveness

A COMPARATIVE STUDY ON THE DIAGNOSTIC VALUE OF THE HAND DIAGRAM AND PHALEN'S TEST IN CARPAL TUNNEL SYNDROME

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Background: Carpal Tunnel Syndrome (CTS) occurs when the median nerve is compressed as it passes through the wrist, leading to sensory symptoms. Nerve conduction studies serve as an objective and effective diagnostic tool and are considered the gold standard for diagnosing CTS. However, due to limited access to electrophysiological testing, several diagnostic modalities have been developed.

Objective: This study aimed to compare the diagnostic performance of the hand diagram and Phalen's test with that of nerve conduction studies as the gold standard.

Methods: A cross-sectional study was conducted from October 2024 to February 2025 at Dr. Moewardi General Hospital. The target population consisted of CTS patients examined at the outpatient clinic of the Neurology Department. A purposive sampling method was used.

Results: A total of 76 hands from 38 study subjects were included. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), accuracy, and kappa coefficient for the hand diagram were 87.5%, 67.68%, 85.71%, 76%, 77.68%, and 0.616 (p = 0.000), respectively. For Phalen's test, the corresponding values were 86.27%, 88%, 93.62%, 70.97%, 87.14%, and 0.714 (p = 0.000), respectively. Receiver Operating Characteristic (ROC) curve analysis showed an Area Under the Curve (AUC) of 0.811 for the hand diagram and 0.871 for Phalen's test.

Conclusion: The hand diagram demonstrated higher sensitivity and NPV, suggesting its potential as a screening tool. In contrast, Phalen's test showed superior specificity, PPV, accuracy, and agreement (kappa), indicating its utility as a confirmatory test when electrophysiological studies are unavailable.

Keywords: Carpal Tunnel Syndrome, hand diagram, Phalen's test

THE TRANSLATION AND VALIDATION OF THE MALAY VERSION OF THE EPILEPSY SELF-STIGMA SCALE

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Objective: Self-stigma refers to internalizing negative beliefs and attitudes associated with stigmatized identity. This study aimed to translate and validate the Malay version of the Epilepsy Self-Stigma Scale (ESSS-M).

Methods: We translated the Japanese Epilepsy Self-Stigma Scale (ESSS) into the Malay version to assess self-stigma among Malay-speaking people with epilepsy (PWE). From July to October 2023, we recruited 100 outpatients from the Epilepsy clinic at the University Malaya Medical Centre. Inclusion criteria were an age of ≥18 years, diagnosed with epilepsy by a neurologist, and the ability to comprehend the Malay questionnaires. Participants also completed the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E) and Generalized Anxiety Disorder-7 (GAD-7).

Results: We recruited 100 participants (60% female) with a mean age of 42.25 years (SD,15.18). Exploratory factor analysis identified eight items loaded on three factors: internalization of stigma, societal incomprehension, and confidentiality. The Kaiser-Meyer-Olkin test value was 0.791, and Bartlett's test of sphericity was significant (p<0.001), suggesting high correlations between variables for a reliable basis in Exploratory Factor Analysis. However, item 1 was loaded under a different component from the initial paper, conceptualized as confidentiality. Cronbach's α values for all items and each factor indicated acceptable internal consistency (α=0.732-0.822). Significant correlations were observed between ESSS total scores, subscale scores, and NDDI-E and GAD-7 scores (r=0.236 to 0.504), showcasing substantial construct validity.

Significance: The findings indicated that the eight-item Malay version of the ESSS exhibited strong reliability and validity for measuring epilepsy self-stigma among the Malay-speaking PWE in Malaysia. However, the construct did not resemble the original version completely.

Keywords: people with epilepsy, self-stigma, scale, reliability, construct validity

THE EFFICACY OF VAGUS NERVE STIMULATION FOR EPILEPSY IN MALAYSIA

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Background: The first vagus nerve stimulation (VNS) implantation in Malaysia was back in 2000, and the implantation rate increased tremendously since 2019. VNS has been used in patients who had persistent seizures despite epilepsy surgeries or were not candidates for epilepsy surgeries. We aimed to study the efficacy of VNS in Malaysia.

Methods: We conducted a retrospective cross-sectional study on the VNS done in Malaysia. We included DRE patients from all age groups who underwent VNS from 1st January 2000 to 31st December 2022. We analysed the efficacy of VNS for patients with at least one year of implantation.

Results: A total of 62 implantations were performed from 2000 to 2022. Most patients (52.5%) had implantation at <18 years old, 54.0% had focal seizures, 34.4% had Lennox Gastaut Syndrome and 23.0% had developmental epileptic encephalopathy. A total of 22.6%, 42.8%, and 63.3% of patients achieve ≥ 50% seizure reduction at three months, six months, and one-year post-implantation, respectively. At their last follow-up, 73.5% of patients had ≥ 50% seizure reduction. The majority of responders were at a current intensity of ≥ 2mA (98.0%) and 81.6% were at a duty cycle of ≥35%. No significant difference was found between responders and non-responders by age at implantation, duration of epilepsy, and seizure type.

Conclusion: VNS is effective for patients with refractory epilepsy in Malaysia with two-third achieving more than 50% seizure reduction at one year and the last follow-up.

Keywords: Vagal nerve stimulation, epilepsy, Malaysia

CLINICAL AND GENOTYPIC FEATURES OF GENETIC EPILEPSY IN CHILDREN UNDER THE AGE OF 6 YEARS AT CHILDREN'S HOSPITAL 2

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Introduction: In Vietnam, genetic testing for epilepsy has only been conducted in the last 10 years, with very few published studies involving small numbers of pediatric patients and specific disease groups. We conducted a study with the aim of describing the clinical characteristics and genotypes of genetic epilepsy in children under 6 years old at Children's Hospital 2.

Methods: This retrospective study was conducted at Children's Hospital 2 from January 2021 to October 2023 on 130 children under 6 years old who underwent genetic testing for epilepsy. Clinical and genetic information related to genetic epilepsy was collected. Seizures, epilepsy, and epileptic syndromes were classified according to the 2017 and 2022 guidelines of the International League Against Epilepsy.

Results: Of 130 children, 53 (male/female ratio 1/1.9, mean age 16.6 ± 18.0 months) were identified with genetic epilepsy via exome sequencing, with a mean onset age of 7.6 ± 11.2 months. Nearly three-quarters had onset before 6 months, and a quarter had a family history. Over 40% showed developmental delay. Generalized tonic-clonic seizures were most common, with focal and generalized epilepsies occurring at similar rates. Epileptic syndromes were classified in 24/53 children, with Dravet syndrome and early-infantile developmental and epileptic encephalopathy being most frequent. The genotype spectrum included *SCN1A* (x17), *PRRT2* (x6), *SCN2A* (x2), *SCN8A* (x2), *KCNT1* (x3), *KCNQ2* (x4), and 17 other genes, revealing 17 novel variants. Six children with PRRT2-related epilepsy had c.649dup and c.649del variants (3 each), exhibiting diverse phenotypes.

Conclusion: This study provides initial insights into the genetic landscape of epilepsy in Vietnamese children, revealing a diverse gene spectrum with *SCN1A* and *PRRT2* being prevalent, and identifies 17 novel variants, enhancing understanding of the *PRRT2* group for improved diagnosis and management.

STUDY OF THE CHARACTERISTICS AND EFFECTIVENESS OF MINIMALLY INVASIVE PAIN MANAGEMENT IN PATIENTS WITH A HISTORY OF SPINAL SURGERY AT DR. KARIADI CENTRAL GENERAL HOSPITAL, 2023–2024

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Background: Persistent or recurrent postoperative spinal pain affect 20-40% of patients. The characteristics of patients with a history of spinal surgery who undergo minimally invasive pain management at the hospital may vary in outcomes.

Objective: To analyze the characteristics and effectiveness of minimally invasive pain management in patients with a history of spinal surgery at Dr. Kariadi Central General Hospital.

Methods: A descriptive cross-sectional study using secondary data from medical records of patients who underwent minimally invasive pain management following spinal surgery at Dr. Kariadi Central General Hospital between January 2023 - December 2024. Samples were obtained using total sampling techniques. Data analysis was performed using univariate analysis to describe frequency distributions and variable characteristics, with quantitative data presented as mean ± standard deviation (SD) and qualitative data summarized accordingly.

Results: A total of 44 procedures were conducted, including 18 radiofrequency ablations (RFA), 12 RFA combined with nerve blocks, and 14 nerve blocks. Five patients underwent two procedures, totaling 39 cases.

Conclusion: Study found female patients were more prevalent (21 cases, 54.5%), with an average age of 51 years. The majority had no comorbidities; among those with comorbid conditions, metabolic disorders were the most frequent (17 cases, 21.28%). The most common diagnosis was canal stenosis (25 cases, 56.8%), with the lumbar region being the most frequently operated site (18 cases, 40.9%). Decompression was the most performed surgical procedure (33 cases, 74.9%), and postoperative pathological findings were predominantly degenerative (29 cases, 65.9%). The most frequent pre-management clinical symptom was recurrent pain (29 cases, 65.9%), while the most common objective patient complaint before pain management was radicular pain (35 cases, 42.68%). RFA was the most frequently performed minimally invasive pain management procedure (18 cases, 40.9%), and clinical data after the procedure showed a reduction in Visual Analog Scale (VAS) pain scores (100%).

ANALYSIS OF CLINICAL CHARACTERISTICS IN RELATION TO EEG FINDINGS IN EPILEPSY PATIENTS: A RETROSPECTIVE STUDY

Ade Akmal Hidayat, Susi Aulina

Background: Epilepsy is a chronic neurological disorder characterized by recurrent seizures caused by abnormal electrical activity in the brain. Electroencephalography (EEG) plays an important role in assessing the brain's electrical activity and helps in the classification and diagnosis of epilepsy.

Objective: This study aims to evaluate the relationship between the clinical characteristics of epilepsy patients and the findings from their EEG results.

Methods: This study is an analytical observational research with a cross-sectional design conducted at Hasanuddin University Hospital. The subjects consist of patients diagnosed with epilepsy. The collected data includes demographic and clinical variables (age, gender, seizure type, family history, management, and comorbidities) as well as EEG results. Analysis was conducted using the chi-square test.

Result: A total of 206 patients were included, with a balanced gender distribution and an average age of 18.34 years. The most common type of seizure was focal (61.7%), and the majority of patients received monotherapy (57.8%). A total of 55.8% of patients showed abnormal EEG results. There was a significant relationship between seizure type and EEG results ($p<0.05$), indicating that seizure type affects the likelihood of EEG abnormalities. However, other variables such as age, gender, family history, management, comorbidities, and seizure interval did not show a significant relationship ($p>0.05$).

Conclusion: The type of seizure has a significant correlation with EEG results, highlighting the importance of seizure classification in EEG interpretation. These findings emphasize the role of EEG as a primary diagnostic tool that cannot be fully replaced by clinical data alone.

Keywords: Epilepsy, Electroencephalography, Clinical Characteristics

DIAGNOSTIC ACCURACY OF MACHINE LEARNING IN DETECTING EPILEPTIC SEIZURE USING INTRACRANIAL ELECTROENCEPHALOGRAPHY (IEEG): SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Advancements in intracranial electroencephalography (iEEG) have facilitated the prediction of epilepsy. However, accurately decoding complex neural signals remains a significant challenge. Machine learning (ML) as a branch of artificial intelligence offers a contemporary approach that could improve the outcome.

Objective: This study aimed to analyse the diagnostic accuracy of machine learning in predicting epileptic seiz ure using data of iEEG.

Methods: The systematic review was conducted based on the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA). Data on the Area Under the Receiver Operating Characteristic Curve (AUROC) from each study were analyzed. Heterogeneity was assessed using the I^2

test. Risk of bias was evaluated by Egger's test. Meta-analysis was performed using MedCalc version 23.0.9.

Results: Seven studies were included in the analysis. Analysis of AUC value resulted 0.984 (95% Confidence Interval (CI) 0.977 - 0.991) with a standard error of 0.003 (p<0.001). The heterogeneity result was classified as substantial heterogeneity with an I^2 value of 56.14% (95% CI 0.00 – 85.47, P = 0.077). Egger's test did not detect any bias (-2.563, 95% CI -4.961 to -0.165, P = 0.044).

Discussion: iEEG research offers unique insights into neural coding, uncovering mechanisms of various brain processes. Currently, expert-driven digital signal processing remains the gold standard for analysis. However, ML is emerging as a powerful tool to enhance the interpretation of intracranial data.

Conclusion: The use of ML demonstrated a high accuracy rate in predicting epileptic seizure which was potential for clinical applications.

Keywords: epilepsy, intracranial electroencephalography, machine learning, meta-analysis, seizure

THE ANTICANCER POTENTIAL OF GABAPENTINOIDS IN CANCER CELL: FROM PAIN RELIEF TO CANCER THERAPY

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Background: Metastatic prostate cancer is becoming one of the leading causes of male mortality, with more than 400,000 cases each year, and this number is expected to double by 2040. Gabapentin, which is widely used for neuropathic pain in cancer patients, shows potential as an anticancer agent through the mechanisms of voltage-gated calcium channel (VGCC) inhibition and apoptosis induction.

Objective: This study was designed to evaluate the potential of gabapentin and pregabalin as anticancer agents in PC-3 prostate cancer cell culture.

Methods: The design of this study is in vitro with a randomized design. PC-3 cells were cultured in Ham's F12 medium and treated with gabapentin and pregabalin in graded doses (i.e., 4,000 ng/ml, 8,000 ng/ml, 16,000 ng/ml, and 32,000 ng/ml). The apoptosis index was analyzed by flow cytometry, while the toxicity test was performed by MTT assay. Data were analyzed by ANOVA and least significant difference (LSD) test at 5% significance level ($\alpha = 0.05$).

Results: A dose-dependent decrease in cell viability, with the lowest viability of 0.211 and 0.208 for gabapentin and pregabalin at a dose of 32,000 ng/ml, respectively. Gabapentin showed 25.6% late-stage apoptosis, slightly higher than pregabalin (25.0%) at the same dose. The mechanism involves inhibition of the α2δ subunit of VGCC, which affects cancer cell proliferation and metabolism. Pregabalin showed slightly stronger cytotoxic effects at an early stage, probably related to its higher affinity for VGCC. This study concludes that gabapentin and pregabalin have anticancer potential through cytotoxic and apoptosis-inducing mechanisms, with gabapentin showing greater efficacy at high doses. These findings support the development of gabapentinoids as adjunctive therapy for prostate cancer, although further research is needed.

Keywords: Gabapentin, Pregabalin, Prostate Cancer, Apoptotic Index, Toxicity

A SYSTEMATIC REVIEW ON EPILEPSY SYNDROMES ASSOCIATED WITH CHROMOSOME 5 ABERRATIONS: IMPLICATION FOR GENETIC COUNSELING

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Background: Chromosome 5 aberrations, involving numerical or structural variants, are increasingly recognized as significant contributors to epilepsy syndromes but often accompanied by variable expressivity. This is the first systematic review that highlights counseling gaps in epilepsy syndromes associated with Chromosome 5 abnormalities.

Methods: We performed a comprehensive search across PubMed, ScienceDirect, and ProQuest databases using customized search strategies for each platform. Our search combined terms for epilepsy with chromosome 5-related terms. This review included English-language observational studies, cohort studies, case-control studies, and case reports, while excluding animal/preclinical studies. Risk of bias and quality assessment were timely conducted.

Results: Our systematic review included 14 studies (3 cohorts, 11 case reports) published between 1992–2018, encompassing 62 subjects (24 male). Seizure onset ranged from infancy to 41 years, with 75.9% generalized-onset (tonic-clonic, myoclonic, atonic, spasms, absence) and 24.1% focal-onset. Neurodevelopmental comorbidities were prevalent (27.4% developmental delay, 19.4% intellectual disability). Other manifestations included psychiatric disorder, dysmorphism, and less commonly congenital heart disease. One case reported mortality due to pneumonia. Genomic testing revealed karyotyping (9/14 studies), FISH (7/14), CMA/CGH array (5/14), and microsatellite markers (3/14) as primary methods. Aberrations involved to 5p only (50%), 5q only (27.4%), or both arms (22.6%). The microdeletions are reported in 12.9%, while others are related to chromosomal region/locus linkage (77.4%) and aneuploidy (6.4%). Inheritance patterns included autosomal dominant (59.7%, penetrance of 70–93%), de novo (11.3%), and rare translocations/rearrangements. Familial cases were reported in 6 studies (52 subjects). Notably, only 2 studies addressed prenatal testing, and 1 discussed psychosocial challenges in genetic counseling.

Conclusion: This review highlights chromosome 5-related epilepsies as clinically diverse, often with generalized seizures and neurodevelopmental comorbidities. While most cases showed autosomal dominant inheritance, critical gaps remain in prenatal testing, recurrence risk and psychosocial support documentation. These findings underscore the need for tailored counseling approaches for epilepsy patients.

Keywords: epilepsy syndromes, chromosome 5, genetic counseling

OUTCOMES OF STATUS EPILEPTICUS: A CROSS-SECTIONAL STUDY

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Background: Status epilepticus (SE) is a neurological emergency with a wide spectrum of outcomes, ranging from full recovery to death or long-term neurological deficits. Evaluating clinical outcomes is essential for understanding prognosis and guiding treatment strategies.

Objective: To analyze the outcome of Status Epilepticus (SE) in adult patients and the factors affecting the outcomes.

Subjects and Methods: A cross-sectional descriptive study in which data were retrospectively collected from 41 inpatients treated in Neurology Department, Nguyen Tri Phuong Hospital, from Feb 2022 to Dec 2024. Modified Rankin scale prior to the presentation was documented and compared with the discharge scores.

Results: Out of 41 cases, 19 (46.3%) were males with an average age of 55.20 ± 20.89 years. There were 20 patients (48.8%) with focal onset

evolving into bilateral convulsive SE, 2 patients with focal motor SE (4.9%), and 19 patients with generalized convulsive SE (46.3%). Common etiologies were acute symptomatic in 24 (58.5%), remote symptomatic in 12 (29.3%), and unclassified in remaining patients. At discharge 10 (24.4%) returned to baseline, 16 (39%) developed neurological disability while 15 (36.6%) expired during the stay. Etiology of status epilepticus had a significant impact on outcome with $p < 0.05$.

Conclusion: Acute etiology was associated with higher mortality whereas return to baseline was also fair among survivors. This has implications for emergency management to significantly improve treatment outcomes.

Keywords: Etiology, Outcome, Status epilepticus

AMYOTROPHIC LATERAL SCLEROSIS (ALS) AND ITS MIMIC SYNDROMES AT A MYANMAR TERTIARY REFERRAL NEUROMUSCULAR CLINIC

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Introduction: Amyotrophic Lateral Sclerosis (ALS) is a progressive irreversible motor neuropathy with variable clinical course, and eventually fatal. There are mimics which are difficult to differentiate from ALS and its variants, but they are potentially remediable. According to previous studies, 10% of possible ALS ultimately turned out to be ALS mimics.

Methods: Patients with progressive asymmetric upper and/or lower motor neurone syndromes who were initially thought to be possible ALS presenting to the neuromuscular clinic over 6-month-period from September 2024 to February 2025 were recruited. Those with systemic manifestations, radicular pain, sensory and sphincter involvement, and significantly high creatinine kinase were excluded.

Results: Among 91 patients enrolled, 38% (35) were ALS: bulbar onset (11), cervical onset (16), lumbar onset (5), flail arm variant (2), flail leg variant (0), and primary lateral sclerosis (1). One patient has SOD1-associated familial ALS. ALS mimic syndromes accounted for 62% (56), and included a variety of conditions: 9 with neuralgic amyotrophy, 8 with motor-predominant chronic inflammatory demyelinating polyneuropathy, 5 with cervical spondylotic polyradiculo -pathy, 5 with metabolic myopathies (including uremic, thyrotoxic, toxin-induced types), 4 with multifocal motor neuropathy, and 5 with genetic distal myopathies (comprising each case of facioscapulohumeral dystrophy, myotonic dystrophy, dysferlinopathy, and 2 others with pending genetic confirmation). Additional cases included 3 with cervical myeloradiculopathy, 3 with lumbosacral radiculopathy, 2 with residual paralytic Guillain-Barré syndrome, and one case each of Miller Fisher overlap, monomelic amyotrophy (Hirayama disease), Kennedy's disease, lead neuropathy, radiation-induced radiculopathy, post-polio syndrome, Isaacs' syndrome, Charcot-Marie-Tooth disease, spinal arteriovenous malformation, Pott's spine, limb-predominant myasthenia gravis, and multiple sclerosis.

Conclusion: ALS and mimics are not uncommon in neuromuscular clinic. Clinical red flags and electrodiagnostic evaluation prompt further accurate diagnosis of either ALS or its mimics as it is essential for guiding care, planning management and reducing psychosocial impact.

Keywords: Amyotrophic Lateral Sclerosis, Mimic Syndromes, Myanmar

CORRELATION BETWEEN THE NUMERIC RATING SCALE AND ELEVATED ERYTHROCYTE SEDIMENTATION RATE IN PATIENTS WITH SUBACUTE TO CHRONIC LOW BACK PAIN

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Background: Low back pain is characterized by pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without radiation to the thighs and/or legs (sciatica). In individuals with low back pain, the release of inflammatory mediators is suspected to contribute to local inflammation, which plays a role in pain manifestation. Consequently, an elevated erythrocyte sedimentation rate (ESR) is believed to be associated with low back pain.

Objective: This study aims to determine the correlation between the Numeric Rating Scale (NRS) and increased ESR levels as an indicator of inflammation in patients with low back pain.

Methods: This was a cross-sectional study utilizing consecutive sampling of patients with subacute to chronic low back pain (onset >7 weeks) who were treated in outpatient and inpatient settings at Wahidin Sudirohusodo Hospital, Makassar, from April to May 2025.

Results: Among 33 patients, 45.5% were female and 54.5% male. The average duration of low back pain onset was 14 weeks, with a mean patient age of 54 years. The mean ESR was 26.61 mm/hour, and the average NRS score was 4.61. Spearman's correlation analysis revealed a statistically significant positive correlation between NRS and ESR levels ($p = 0.006$, $p < 0.05$), with a Spearman's correlation coefficient of 0.472, indicating a moderate positive correlation (0.4–<0.6). Thus, higher ESR levels were associated with higher NRS scores.

Conclusion: There is a moderate positive correlation between ESR levels and NRS scores in patients with subacute to chronic low back pain, suggesting that higher inflammation levels are associated with greater pain intensity.

Keywords: Low back pain, erythrocyte sedimentation rate, Numeric Rating Scale, inflammation, pain intensity

EFFICACY OF NEUROMODULATION STRATEGIES ON MOTOR FUNCTION IN PARKINSON'S DISEASE: A NETWORK META-ANALYSIS

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Background: PD is characterized by bradykinesia, postural instability, rigidity, and resting tremor. Even though the disease can be controlled mainly by levodopa, patients still experience the symptoms and levodopa-induced dyskinesia after long-term use of the medication thus highlighting the growing need for other approach.

Objective: This study aims to evaluate the efficacy of neuromodulation strategy on motor function in Parkinson's disease (PD).

Methods: Following PRISMA guidelines, six databases were searched up to January 2025 for studies reporting the neuromodulation strategy effects on motor function in PD. The risk of bias was assessed using the RoB-2 tools. A Bayesian network meta-analysis calculated mean differences (MD) for efficacy and odds ratios for adverse events, reporting 95% credible intervals (CrI) and surface under the cumulative ranking (SUCRA).

Results: Thirteen randomized controlled trials involving 1,132 patients and 10 eligible neuromodulation strategies were included. RoB-2 reported generally "some concerns" risk of bias. In pairwise comparisons of UPDRS III scores, only DBS-GPi and DBS-STN showed significant MD versus sham in both ON-medication (−7.38 [95% CrI: −11.74, −3.08] and −6.82 [95% CrI: −10.48, −3.13]) and OFF-medication states (−16.97 [95% CrI: −27.3, −6.45] and −18.52 [95% CrI: −27.3, −9.95]). SUCRA values ranked DBS-GPi and DBS-STN as most effective. No neuromodulation strategy differed significantly in adverse event incidence.

Conclusion: This study found that DBS-GPi and DBS-STN are the most effective neuromodulation strategies for improving motor symptoms in PD patietns. These findings suggest that neuromodulation, particularly DBS, may be benefiial for PD patients, especially those with prolonged levodopa use.

Keywords: Parkinson's disease; Neuromodulation; Unified parkinson's disease rating scale; Randomized controlled trial

ADENO-ASSOCIATED VIRUS AS A VIRAL VECTOR-BASED GENE THERAPY FOR PARKINSON'S DISEASE: A META-ANALYSIS OF CLINICAL TRIALS

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Background: PD is recognized as the fastest-growing neurological disorder worldwide in terms of mortality and disability. AAV are non-pathogenic, replication-defective viruses that can transduce post-mitotic cells, such as neurons, making them a valuable tool in addressing neurodegenerative disorders. Progressively with ongoing clinical trials, AAV is considered a potential option for gene therapy in PD.

Objective: This study aims to evaluate the efficacy of adeno-associated virus (AAV) as vectors for gene therapy in Parkinson's Disease (PD)

Methods: PRISMA guidelines were used for literature research (PROSPERO CRD42024610306). The Cochrane Risk of Bias Tool 2.0 and the Risk of Bias In Non-randomized Studies - of Interventions were employed to assess the risk of bias. The main outcome was the mean differences (MD) in the Unified Parkinson's Disease Rating Scale (UPDRS) part III before and after AAV treatment.

Result: Four relevant studies included in this systematic review. There were three single arm clinical trials and one RCT. The RCT study showed a low risk of bias while all non-RCTs exhibited moderate risk of bias. This meta-analysis demonstrated a significant decrease in the post-intervention UPDRS III score, both in ON- and OFF-medication, by MD 3.43 (95% CI: 2.39-4.47; P<0.00001) and 10.90 (95% CI: 6.97-14.82; P<0.00001) respectively.

Conclusion: This study showed the effectiveness of AAV as novel therapy for PD with a significant reduction of UPDRS III motoric scores. Further clinical trials with a larger population are needed to evaluate the understanding of AAV gene therapy for PD.

Keywords: Parkinson's disease; Adeno-associated virus; Gene therapy; Clinical trial

FECAL MICROBIOTA TRANSPLANTATION FOR PARKINSON'S DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and Aims: The gut-brain axis is increasingly recognized in the pathogenesis of Parkinson's Disease (PD), with gut dysbiosis implicated in both motor and non-motor symptoms. Fecal microbiota transplantation (FMT) has emerged as a promising intervention to restore microbial balance and improve clinical outcomes, as observed in various randomized control trials and cohort studies. This systematic review and meta-analysis aimed to evaluate the efficacy and safety of FMT in PD management.

Methods: A systematic search of PubMed, EMBASE, and Cochrane databases was conducted up to February 7, 2025, to identify RCTs and cohort studies evaluating FMT in adults with PD. We computed standardized mean differences (SMDs) with accompanying 95% confidence intervals (CIs) for each study and pooled the results using a fixed effects meta-analysis.

Results: Six studies involving 183 participants were included. A statistically significant benefit was observed in non-motor symptoms at 12 months, with the FMT group demonstrating greater improvement compared to controls. The Non-Motor Symptom Scale (NMSS) showed a pooled standardized mean difference (SMD) of 0.49 (95% CI: 0.06 to 0.92). Although not statistically significant, motor symptoms (UPDRS Part 1–3) showed a consistent trend toward improvement over time, from baseline to 3-, 6-, and 12-month follow-up. FMT was well tolerated, with no serious adverse events reported.

Conclusions: Our meta-analysis showed a trend towards improvement in the motor symptoms in patients receiving FMT compared to controls, as well as significant improvement in NMSS scores. FMT shows encouraging potential in improving both motor and non-motor PD symptoms. Given these early findings, larger, rigorously designed randomized trials would be useful to establish long-term efficacy, optimize treatment protocols, and identify responders.

Keywords: Parkinson's Disease, Fecal Microbiota Transplantation, Gut-Brain Axis, Systematic Review, Meta-Analysis

CLINICAL CHARACTERISTICS AND EVALUATION OF TREATMENT OUTCOMES FOR PREVENTION OF CHRONIC TENSION-TYPE HEADACHE PATIENTS WITH TOPIRAMATE AT NAM CAN THO UNIVERSITY MEDICAL CENTER

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Background: Chronic tension-type headache (CTTH) has a prevalence of approximately 2-3% of global population and significantly impairing quality of life. Tricyclic antidepressants (TCAs) are often the primary prophylactic treatment but have numerous side effects, leading to the consideration of Topiramate (TPM) as a second-line option.

Objective: This study aims to describe the clinical characteristics and evaluate the outcomes of prophylactic treatment with Topiramate in CTTH patients.

Methods: Eighteen patients with CTTH were included in this descriptive case series. Each received 100 mg of Topiramate daily over 12 weeks.

Results: The sample comprised 13 women (72.2%) and 5 men (27.8%), mean age 39.05±15.80 years. The predominant headache location was the bilateral temporal region (83.3%) and parietal region (88.9%) ,with attacks lasting nearly 10 hours daily (44.4%). VAS pain scores were >9 in 2 patients (11.1%), 7-9 in 10 patients (55.6%), and 5-7 in 6 patients (33.3%). Associated symptoms included anxiety (83.3%), insomnia (55.6%), phonophobia (44.4%), nausea (27.8%), scalp paresthesia (16.7%), and photophobia (5.6%), with a mean GAD-7 score of 10.83±5.3. By the end of treatment, only one patient had not fully recovered but experienced reduced pain and headache duration. No side effects were reported among the recovered patients.

Conclusion: Topiramate shows potential as a prophylactic treatment for CTTH. Further clinical trials are necessary to confirm its role in prevention.

Keywords: Chronic tension-type headache, Topiramate, Tricyclic antidepressants

CALCITONIN GENE-RELATED PEPTIDE (CGRP) INHIBITORS IN EPISODIC AND CHRONIC MIGRAINES: *A MULTIPLE TREATMENT COMPARISON (MTC) META-ANALYSIS*

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Introduction: Migraine is a prevalent neurological disorder characterized by recurrent headaches, significantly impacting quality of life. Current treatments often fail to address the underlying causes, leading to medication overuse headaches. Calcitonin Gene-Related Peptide (CGRP) inhibitors have emerged as a promising preventive treatment, targeting the pathophysiology of migraines.

Objective: This meta-analysis aims to evaluate the efficacy and safety of CGRP inhibitors in reducing monthly migraine days (MMD) in patients with episodic and chronic migraines.

Methods: A comprehensive search was conducted in databases including ScienceDirect, Cochrane CENTRAL, PubMed, and Wiley up to January 29, 2023. The inclusion criteria focused on randomized controlled trials (RCTs) assessing the effect of CGRP inhibitors on migraine patients, with MMD as the primary outcome. A total of 42 studies were included for qualitative analysis, and 32 were included in the quantitative analysis.

Statistical analysis was performed using Review Manager ver 5.4, employing random-effects models.

Results: The meta-analysis included 22,295 patients from studies published between 2013 and 2022. CGRP inhibitors demonstrated a significant reduction in MMD by 2.12 days compared to placebo (Mean Difference -2.12; 95% CI -2.41 to -1.84; p=0.02). Galcanezumab showed the most substantial effect, while erenumab showed the least.

Discussion: CGRP inhibitors significantly reduce migraine frequency, with variations in efficacy potentially influenced by drug potency and study population composition. The safety profile was comparable to placebo, with no significant differences in adverse events.

Conclusion: CGRP inhibitors offer a promising option for migraine prevention, justifying their inclusion in management guidelines. Further research is needed to explore long-term effects and efficacy across diverse populations.

Keywords: migraine, CGRP inhibitor, preventive treatment, MTC meta-analysis

UNLOCKING THE POTENTIAL OF ATOGEPANT: A SYSTEMATIC REVIEW ON ITS ROLE IN PREVENTING MIGRAINES

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Background: Atogepant is an orally administered calcitonin gene-related peptide (CGRP) receptor antagonist for migraine prevention at doses of 10–60 mg/day. Its mechanism offers a targeted prophylactic approach distinct from traditional therapies. We conducted a systematic review to evaluate the efficacy, tolerability, and safety of 12-week atogepant treatment versus placebo in patients with episodic and chronic migraine.

Objective: To assess atogepant's effectiveness in reducing monthly migraine days (MMD) and to characterize its associated adverse events over a 12-week treatment period.

Methods: In line with PRISMA guidelines, we searched PubMed, Scopus, and Google Scholar was carried out from 2015 to 2025 for English-language randomized clinical trials (RCTs). Of 1.827 records screened, 10 full text articles were retrieved and eight double-blind RCTs met inclusion criteria. Study quality was evaluated using the RoB 2 tool.

Result: From 1,827 identified articles, 8 studies with a total of 6,323 migraine patients were included. The phase 3 randomized controlled clinical trial showed that atogepant (10-60 mg/day) significantly reduced MMD compared to placebo within 12 weeks of therapy. A significant reduction in MMD was already apparent from week one and persisted until week 12. In the chronic migraine population, 2 article that proved significant MMD reduction than placebo. The most commonly AEs were constipation and nausea. These AEs were mild to moderate, and SAEs or discontinuation of treatment due to adverse effects were rare.

Conclusion: Atogepant was significantly effective in reducing MMD. The therapeutic effect appeared early and tended to increase at higher doses. The safety profile of atogepant was acceptable with the main side effects being constipation and mild nausea. These findings support the use of atogepant as an effective and relatively safe migraine prophylaxis option.

Keywords: Atogepant, Migraine, Migraine Preventive, Calcitonin Gene-Related Peptide (CGRP) receptor antagonist

ASSOCIATION OF VITAMIN D DEFICIENCY IN MIGRAINE – AVIDDIM STUDY

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Introduction: Migraine is a debilitating neurological disorder affecting 15.2% of the global population and 9% of Malaysians. Emerging evidence suggests that vitamin D may influence migraine through its roles in pain modulation, inflammation, and immune regulation. This cross-sectional study aimed to determine the prevalence of vitamin D deficiency among patients with migraine (pwM) and its association with migraine-related disability.

Methods: This cross-sectional study included 80 pwM aged more than 18 years, who were diagnosed according to the 3rd edition of the International Classification of Headache Disorders (ICHD-III) at Hospital Al-Sultan Abdullah, Universiti Teknologi MARA. Patients with conditions such as osteomalacia, chronic kidney, or liver cirrhosis were excluded. Migraine disability was assessed using the Migraine Disability Assessment (MIDAS) tool and categorized into two groups: no disability (score 0–5) and disability (score 6–20+). Serum 25-hydroxyvitamin D [25(OH)D] levels were measured to classify participants as vitamin D deficient (<50 nmol/L) or non-deficient (≥50 nmol/L).

Results: 68 out of 80 pwM (83.8%) were vitamin D deficient. Among them, 60 pwM (88.2%) experienced migraine-related disability, significantly higher than those with sufficient vitamin D levels (p = 0.017). This suggests a potential association between vitamin D deficiency and greater migraine-related disability. The study population was predominantly females (67 females, 13 males). Among females, 88.1% experienced disability compared to 61.5% of males, indicating a statistically significant female predominance in migraine-related disability (p = 0.032).

Conclusion: A high proportion of pwM had vitamin D deficiency, and most of them, particularly females, experienced significant migraine-related disability. These findings support the potential role of vitamin D in migraine pathophysiology and highlight the need for monitoring vitamin D status. Routine supplementation could be considered as part of comprehensive migraine management strategies.

THE BURDEN OF HEADACHE IN YOUNG ADULTS IN INDONESIA: A CALL OF ACTION

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Background: Headache disorders are highly prevalent among young adults in Indonesia, resulting in significant personal and societal impacts. Despite their frequency, comprehensive regional data on headache epidemiology in Southeast Asia, particularly in young adults, remain limited.

Objective: This study aims to analyze the prevalence and burden of headache disorders, specifically migraine and tension-type headache (TTH), among young adults in Indonesia and other ASEAN countries using recent global data, and to inform strategies for improved headache management.

Methods: We conducted a cross-sectional analysis utilizing the Global Burden of Disease (GBD) 2021 database, which compiles epidemiological data from 204 countries. Headache disorders were classified according to the International Classification of Headache Disorders, 3rd edition (ICHD-3), and the International Classification of Diseases, 11th revision (ICD-11). Key indicators assessed included prevalence and disability-adjusted life years (DALYs) for migraine and TTH in ASEAN young adults. As the study used publicly available data, ethical approval was not required.

Results: Our findings reveal a high prevalence of migraine and TTH among young adults in ASEAN, with Indonesia experiencing a substantial burden as indicated by DALYs per 100,000 population. Headaches are among the leading causes of poor health in this demographic. In primary care, most headaches are benign; however, differentiating primary from secondary headaches remains a diagnostic challenge, emphasizing the need for systematic assessment and evidence-based management protocols.

Conclusion: The burden of headache in young adults is significant in Indonesia, highlighting the urgent need to strengthen primary care capacity for headache diagnosis and management. Implementing standardized protocols, enhancing physician education, and promoting patient engagement are critical to improving outcomes and quality of life for headache sufferers.

Keywords: ASEAN, Burden of disease, Headache, Indonesia, Migraine, Primary care, Tension-type headache, Young adults

FACTORS INFLUENCING FUNCTIONAL OUTCOME IN GUILLAIN-BARRÉ SYNDROME PATIENTS TREATED WITH PLASMAPHERESIS AND INTRAVENOUS IMMUNOGLOBULIN

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Background: Treatment of Guillain-Barré Syndrome (GBS) aims to limit the progression of paralysis, promote motor recovery, and reduce neurological sequelae. Plasmapheresis (PE) and intravenous immunoglobulin (IVIg) have been proven to be effective immunomodulatory treatments that accelerate the recovery of motor function.

Objective: The objective of this study is to evaluate the efficacy of PE versus IVIg in GBS patients and to identify factors that influence functional outcome.

Methods: This retrospective study was conducted at Cipto Mangunkusumo Hospital in Jakarta between 2023 and 2024. Data were collected from the medical records of 44 GBS patients who received either PE or IVIg treatment. Complete data for analysis up to a one-month follow-up were available for 23 individuals. Functional status was evaluated using the Hughes Functional Grading Scale (HFGS) and the Medical Research Council (MRC) scale for muscle strength at nadir, discharge, and one-month follow-up. The analysis examined potential influencing factors including sex, age, antecedent infection, onset of therapy, total therapy, bulbar palsy, autonomic dysfunction, sensory impairment, electrophysiological subtypes, cerebrospinal fluid protein levels, MRC and HFGS score at admission, severity (HFGS > 3 at nadir), modified Erasmus GBS Outcome Score (mEGOS), and Erasmus GBS Respiratory Insufficiency Score (EGRIS).

Results: The efficacy of PE and IVIg in improving motor function, as measured by changes in HFGS and MRC scores, was statistically comparable. However, patients treated with PE had a significantly longer hospital stay ($p = 0.012$). Moreover, age ($p = 0.027$) and mEGOS ($p = 0.043$) were identified as significant factors influencing the likelihood of achieving at least a one-grade improvement in functional status by one month.

Conclusion: PE demonstrates equivalent efficacy to IVIg in enhancing functional outcomes in GBS patients, albeit with a longer hospital stay. Furthermore, advanced age and higher mEGOS are significant predictors of reduced functional improvement at the one-month follow-up.

Keywords: Guillain-Barré Syndrome, Plasmapheresis, Intravenous immunoglobulin, Treatment

CLINICAL AND RADIOLOGIC PROFILE OF PATIENTS DIAGNOSED WITH TRANSIENT GLOBAL AMNESIA IN A TERTIARY HOSPITAL: A RETROSPECTIVE STUDY

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Objectives: This study aims to retrospectively describe the clinical and radiologic profile of transient global amnesia (TGA) patients. Specific objectives are first, to determine the demographic and comorbid conditions of TGA patients, second is to determine the prevalence of magnetic resonance imaging diffusion weighted imaging (MRI DWI) hippocampal lesions, its time relationship from symptom onset and its morphologic characteristics, and lastly, to determine the dementia visual rating scale scores on neuroimaging for these patients.

Methods: This is a retrospective study in a tertiary hospital from 2018-2022. A total of 20 TGA patients were included in the study and their medical records and neuroimaging were reviewed.

Results: TGA patients had a mean age of 61.4 years with female predominance. Prevalent comorbid conditions include hypertension, dyslipidemia, and diabetes and majority of patients were discharged with anti-thrombotics. Mean symptom onset-to-scan time was 8.33 hours and 1 patient (detection rate of 5%) who underwent neuroimaging after 21.7 hours demonstrated typical punctate hippocampal DWI hyperintensity. None exhibited significant cortical atrophy.

Conclusion: TGA patients showed female predominance, occurring mostly within the 5th-6th decade with a moderate prevalence of vascular risk factors and absence of significant cerebral atrophy. A conventional MRI protocol yielded a 5% detection rate with a delay of 21 hours from symptom onset. In a resource-limited setting such as in the Philippines, this may be the optimal time to perform DW-MRI to in patients who present with symptoms of TGA that arrive beyond the therapeutic window for thrombolysis

Keywords: Punctate hippocampal DWI hyperintensity, Diffusion-Weighted Imaging, Transient Global Amnesia.RR17. Neuro-Imaging

CLINICAL AND NEUROIMAGING FEATURES IN PEDIATRIC MITOCHONDRIAL DNA RELATED MITOCHONDRIAL DISEASES: A 24-CASE SERIES FROM A TERTIARY PEDIATRIC CENTER IN VIETNAM

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Background: Mitochondrial disorders caused by mitochondrial DNA (mtDNA) mutations are rare but clinically heterogeneous conditions that frequently affect the central nervous system in children.

Objective: To describe the clinical characteristics, neurological manifestations, and neuroimaging findings in a group of pediatric patients with genetically confirmed mtDNA-related mitochondrial disorders.

Methods: We retrospectively reviewed the medical records of 24 pediatric patients diagnosed with mtDNA mutations at Vietnam National Children's Hospital between March 2022 and May 2025. Data on clinical presentation, neuroimaging findings, and molecular studies were analyzed. Genetic confirmation was obtained through PCR amplification and next-generation sequencing (NGS) targeting all 37 mtDNA genes.

Results: Among the 24 patients (15 females, 9 males), the median age at symptom onset was 8 years (range: 6 months to 15 years). Common initial manifestations included seizures (15/24), developmental delay or regression (10/24), headache (9/24), and altered mental status (9/24). Clinical phenotypes included mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes-MELAS (n = 11), Leigh syndrome (n = 5), myoclonic epilepsy with ragged red fibers -MERRF (n = 2), and non-syndromic mitochondrial encephalopathy (n = 6). Brain MRI revealed deep gray matter involvement in 12 patients, cortical and subcortical signal abnormalities consistent with stroke-like lesions were noted in 11 patients and 5 patients had cerebellar abnormalities. Two patients had normal neuroimaging at diagnosis. The m.3243A>G mutation was the most frequently identified, found in 12 of the 24 patients.

Conclusion: Pediatric mitochondrial disorders due to mtDNA mutations present with a wide spectrum of neurological symptoms and variable but characteristic neuroimaging findings. Timely diagnosis requires a high index of suspicion, supported by early neuroimaging and genetic testing.

Keywords: Mitochondrial disease, Pediatric neurology, mtDNA mutation, MELAS, Vietnam

RECURRENT ISCHEMIC STROKE WITHOUT VASCULAR RISK FACTORS: IS ANGIOGRAPHY NECESSARY? CASE REPORT

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Introduction: Recurrent ischemic stroke (IS) due to internal carotid artery (ICA) dissection is a rare but important condition to recognize, especially in patients without vascular risk factors. Early detection and appropriate management can prevent recurrence and further neurological complications.

Case: A 45-year-old woman presented to the Emergency Department (ED) with right flaccid hemiparesis, right supranuclear VII and XII nerve paresis,

and right Babinski reflex. There were no vascular risk factors. MRI of the head showed subacute-chronic cerebral infarction in the left temporo-occipital lobe. The patient was diagnosed with ischemic thromboembolic stroke and was given double antiplatelet therapy. Three months later, the patient returned to the ED with sensory aphasia. Head Computed tomography angiography (CTA) showed a fusiform aneurysm of the C1 segment of the left ICA. Cerebral Digital Subtraction Angiography (DSA) confirmed the presence of an unruptured dissecting fusiform aneurysm of the left ICA. The patient underwent carotid artery stent placement. Dual antiplatelet therapy was continued for 6 months with re-evaluation of DSA showing reduction in aneurysm size.

Discussion: Cases of recurrent stroke without vascular risk factors require angiography to identify the presence of aneurysm. Thrombosis in unruptured aneurysms is caused by blood stagnation and endothelial turbulence resulting in endothelial damage and atherosclerosis formation. Management of recurrent stroke in cases of aneurysm is stenting to prevent stroke recurrence in the future.

Conclusion: Ischemic stroke in individuals without vascular risk factors needs to be suspected of originating from structural etiologies such as aneurysm. Further neurovascular examinations such as CTA and DSA are important in establishing the diagnosis. Endovascular interventions such as carotid artery stenting can be an effective therapeutic option in this case.

Keywords: Aneurysm, Ischemic Stroke, Risk Factors, Stents

BEYOND TRADITIONAL RISKS: HYPERPROLACTINEMIA-INDUCED ACUTE ISCHEMIC STROKE

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Introduction: Acute ischemic stroke (AIS) remains a significant health concern with high mortality and long-term disability. Among several well-established risk factors of AIS, hyperprolactinemia emerged as a nontraditional contributor. We report a case of hyperprolactinemia-induced AIS in a patient already treated with cabergoline and discuss its role in the pathophysiology of AIS.

Case Presentation: A 50-year-old non-smoking male presented with a sudden onset of right-sided weakness, slurred speech, facial asymmetry, and unsteady gait 18 hours before admission. Past medical history was remarkable for a prolactinoma resected via craniotomy four years prior, with routine medication of cabergoline 0.5mg twice weekly. General examination revealed normal vital signs with grade II obesity. Neurology examination demonstrated GCS of E4M6V5, right supranuclear facial nerve paralysis, and reduced motor strength (MRC grade 4+) in the right extremities, with normal reflexes and bilateral negative Babinski reflex. Non-contrast brain MRI showed an acute left thalamic infarct with residual mass in the intrasellar wall, suggestive of hypophyseal adenoma. Laboratory examinations revealed a normal lipid profile and blood glucose with elevated prolactin level (969ng/mL; normal 3.0 – 25.0ng/mL). Diagnosis of AIS was made, and the patient was treated with clopidogrel, cabergoline, and citicoline.

Discussion: Hyperprolactinemia may be a nontraditional risk factor for AIS due to its inflammatory and prothrombotic effects through amplifying ADP and P-selectin expression. The risk of AIS is 1.5-fold higher in patients with prolactin levels exceeding five times the upper normal limit. Despite previous prolactinoma resection and ongoing cabergoline therapy, our patient's prolactin level remained markedly elevated, probably related to residual mass. The coexistence of hyperprolactinemia and obesity may have acted synergistically, increasing the risk of AIS.

Conclusion: This case supports the role of hyperprolactinemia as a stroke risk factor. Optimal control of hyperprolactinemia, even after tumor resection, remains a cornerstone for preventing AIS.

Keywords: hyperprolactinemia, acute ischemic stroke, prolactinoma

MOYAMOYA DISEASE PRESENTED AS SPONTANEOUS INTRACEREBRAL HEMORRHAGE IN ADULTHOOD: A CASE REPORT

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Introduction: Moyamoya disease (MMD) is a rare progressive cerebrovascular disorder characterized by stenosis or occlusion of the intracranial internal carotid arteries and their major branches, accompanied by the development of abnormal collateral vessels that resemble a "puff of smoke". This report presents a case of moyamoya disease in a young adult with hemorrhagic presentation with high Suzuki stage.

Case Description: A 45-year-old male presented with sudden-onset right-sided weakness, slurred speech, right facial palsy and no significant risk factors. A non-contrast CT scan brain revealed an intracerebral hemorrhage involving the left thalamus, internal capsule, putamen, and caudate nucleus with an sICH score of 3. Cerebral angiography showed right terminal ICA stenosis with "puff of smoke" collaterals, and complete left ICA occlusion with perfusion occuring through the external carotid branches.

Discussion: In this case, intracerebral hemorrhage resulted from rupture of posterior thalamoperforator moyamoya collaterals. Cerebral angiography demonstrated differential disease severity, with disparate Suzuki staging. Revascularization (STA–MCA bypass or EDAS) is recommended on the right side (Suzuki grade 3), supported by the presence of functional basal collaterals and suitable recipient vessels. On the left side (Suzuki grade 6), revascularization is not feasible; therefore, management focuses on stabilization, stroke prevention, and long-term follow-up. In the Japan Adult Moyamoya Trial (JAM Trial), the hazard ratio for rebleeding in the direct bypass group was 0.355 (95% CI 0.125–1.009), indicating a 64.5% reduction in risk of rebleeding.

Conclusion: Higher Suzuki grades are associated with an increased risk of hemorrhage. Surgical revascularization, such as STA-MCA bypass, reduces the risk of rebleeding in MMD. This case is indicated for intracranial bypass surgery.

Keywords: Moyamoya disease, Hemorrhage moyamoya disease, High-grade Suzuki

SPONTANEUS RESOLUTION OF A TRAUMATIC CAROTID-CAVERNOUS FISTULA IN A PEDIATRIC PATIENT WITH SEVERE OCULAR MANIFESTATIONS: A CASE REPORT

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Introduction: Carotid-cavernous fistula (CCF) is an uncommon vascular condition characterized by an abnormal connection between the carotid arterial system and the cavernous sinus. Direct CCFs (Barrow Type A), often resulting from trauma, involve a high-flow shunt directly between the internal carotid artery (ICA) and the cavernous sinus. These typically manifest with proptosis, ocular bruit, and conjunctival chemosis. Early diagnosis in children is crucial due to potential risks, including vision loss.

Case Description: We present the case of a 12-year-old boy who developed left eye proptosis, redness, diplopia, decreased visual acuity, and headache two months after head trauma. Initial examination revealed visual acuity of 1/60, cranial nerve III, IV, and VI paresis, proptosis, conjunctival chemosis, and an ocular bruit. Brain MRI, MRA, and MRV confirmed a left Type A CCF. The family declined endovascular coiling. Eight months later, he was readmitted with worsening headache, increased redness and tearing, complete vision loss in the left eye, marked proptosis, and severe orbital congestion. Repeat angiography showed spontaneous CCF closure but also retinal detachment, subretinal hemorrhage, and chronic vitreous hemorrhage.

Discussion: Our patient exhibited the classic ocular triad of proptosis, orbital bruit, and conjunctival chemosis, along with elevated intraocular pressure, common in CCF. While direct CCFs typically require intervention, spontaneous thrombosis occurred in this case without endovascular treatment. Despite spontaneous closure, the delayed intervention led to severe ocular complications, including permanent vision loss.

Conclusion: This case highlights a rare instance of traumatic Type A CCF in a child with spontaneous resolution. However, the spontaneous closure did not prevent severe and persistent ocular complications, including complete vision loss and retinal detachment. This underscores the critical importance of timely intervention for traumatic CCFs in pediatric patients to prevent irreversible visual impairment, even if spontaneous closure occurs

Keywords: Carotid-Cavernous Fistula (CCF), Traumatic CCF, Pediatric CCF , Type A CCF, Spontaneous Thrombosis, Ocular Complications

HEMORRHAGIC TRANSFORMATION IN INFARCTION MIMICKING AVM IN A PEDIATRIC PATIENT WITH MALNUTRITION FOLLOWING DUAL ANTIPLATELET THERAPY

Indra Pahri Putra, Muhammad Yunus Amran, Hasmawaty Basir

Background: Hemorrhagic transformation (HT) in cerebral infarction is a relatively rare occurrence, particularly in pediatric patients. It involves the progression of ischemic strokes into hemorrhagic lesions and can mimic other conditions, such as arteriovenous malformation (AVM). Malnutrition, which contributes to vascular fragility through mechanisms such as increased vascular endothelial growth factor (VEGF) expression, may further complicate clinical outcomes. This case report discusses the diagnostic challenges and treatment options in a 9-year-old male with hemorrhagic transformation in cerebral infarction and concurrent malnutrition.

Case Description: A 9-year-old male patient presented with left-sided weakness and speech difficulties for two months. Anthropometric measurements showed a weight of 23 kg and height of 120 cm, classified as underweight and stunted according to CDC growth charts. Initial imaging (CT scan) suggested an arteriovenous malformation; however, further investigations with DSA, MRI, and MRA confirmed cerebral infarction due to thrombosis in the distal right middle cerebral artery. The patient received intravenous fluids, antibiotics, citicoline, mannitol, and supportive care addressing nutritional status.

Discussion: Hemorrhagic transformation following ischemic stroke is associated with a higher risk of poor prognosis, especially in malnourished pediatric patients due to increased vascular fragility mediated by VEGF upregulation. Imaging modalities such as CT, MRI, and DSA are critical for accurate diagnosis and differentiation from other vascular anomalies like AVM. Management includes supportive therapy, neuroprotective agents, and careful monitoring. Nutritional rehabilitation is also essential to improve vascular integrity and patient outcomes.

Conclusion: Early recognition and appropriate multidisciplinary treatment of hemorrhagic transformation, particularly in malnourished children, are crucial to reducing morbidity. This case highlights the importance of advanced imaging and the consideration of nutritional status in managing complex pediatric neurological disorders.

Keywords: Hemorrhagic transformation, Pediatric stroke, Cerebral infarction, Arteriovenous malformation, Malnutrition

INTRACAVERNOUS ANEURYSM MIMICKING TOLOSA-HUNT SYNDROME RESULTING IN FATAL SUBARACHNOID HEMORRHAGE: A CASE REPORT

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Background: Tolosa-Hunt Syndrome (THS) is a rare idiopathic granulomatous inflammatory disorder affecting the cavernous sinus and presenting as painful ophthalmoplegia. This report discusses a case where an intracavernous aneurysm mimicked THS, ultimately resulting in a fatal subarachnoid hemorrhage (SAH).

Introduction: Intracavernous aneurysms (ICAs) account for 2–9% of intracranial aneurysms and typically present with painful ophthalmoplegia due to compression of cranial nerves (CN) III, IV, V1, V2, and VI within the cavernous sinus. Their clinical presentation often overlaps with Tolosa-Hunt syndrome (THS), an idiopathic granulomatous inflammation of the cavernous sinus. While THS responds dramatically to steroids, ICAs require urgent vascular intervention to prevent rupture. We report a fatal case of ICA rupture initially diagnosed as THS, emphasizing the need for early vascular imaging in atypical presentations of painful ophthalmoplegia.

Case Presentation: A 56-year-old man presented with a 1-day history of right ptosis and periorbital pain, with diplopia. Neurological examination showed paresis of cranial nerves III, IV, and VI on the right without nuchal rigidity. Initial head CT showed old infarct of the internal capsule, leading to diagnosis of Tolosa-Hunt Syndrome. The periorbital pain responded to high dose corticosteroids with pain scale of 9 decreasing to 1. Further investigations revealed elevated blood pressure, leukocytosis, hyperglycemia, and mild renal impairment. On the seventh day of admission, patient suddenly developed loss of consciousness. Subsequent CT scan showed subarachnoid hemorrhage in the basal cistern and intraventricular hemorrhage. The patient deteriorated into coma and died on the hospital eighth day despite intensive care.

Discussion: This case highlights the overlapping clinical features of THS and aneurysmal pathology in the cavernous sinus. Although THS is usually benign and responsive to steroids, underdiagnosis may delay appropriate vascular evaluation. In this patient, an unrecognized intracavernous aneurysm likely ruptured, leading to fatal SAH. Neuroimaging with MRI and contrast-enhanced angiography should be considered in cases with steroid response.

Conclusion: Early and accurate differentiation between THS and aneurysmal lesions is essential. Vascular imaging is essential in cases with a high-risk profile or diagnostic uncertainty to prevent potentially fatal complications. ICA should be excluded in painful ophthalmoplegia, even with symptoms similar to THS. Early and urgent CT angiography (CTA) or MR angiography (MRA) is essential to prevent fatal outcomes.

Keywords: Intracavernous aneurysm, Tolosa-Hunt syndrome, subarachnoid hemorrhage, ophthalmoplegia, fatal outcome

RECURRENT ISCHEMIC STROKE WITH TRANSCORTICAL MOTOR APHASIA DUE TO MOYAMOYA DISEASE: A CASE REPORT

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Introduction: Moyamoya disease is a rare, progressive cerebrovascular disorder characterized by stenosis of the internal carotid arteries and the formation of fragile collateral vessels. It increases the risk of both ischemic and hemorrhagic strokes, particularly in children and young adults. In Indonesia, six cases of Moyamoya disease and one case of Moyamoya syndrome were reported over a four-year period, with an estimated prevalence of 11.9 cases per 100,000 imaging scans. Currently, there is no curative treatment. Early diagnosis and timely surgical intervention are essential, as pharmacological therapy serves only as secondary prevention and cannot halt disease progression. Both medical and surgical strategies aim to improve cerebral perfusion.

Case Report: A 49-year-old male presented with a one-month history of sudden-onset right-sided weakness, preceded by transient loss of consciousness, slurred speech, and significant expressive language difficulties, requiring gestures and writing for communication. His medical history included a transient ischemic attack six years earlier, hyperlipidemia, and chronic heavy smoking. Neurological examination revealed transcortical motor aphasia, spastic right hemiparesis, hyperreflexia, and a positive Babinski sign on the right lower extremity. Cerebral angiography demonstrated severe right-sided (Grade III) and moderate left-sided (Grade II) Moyamoya disease, with prominent stenosis and collateral vessel formation.

Discussion: This case illustrates the progressive nature of Moyamoya disease and its association with recurrent stroke and language

impairment due to vulnerable collateral networks. Diagnosis Moyamoya disease requires angiographic confirmation via DSA or MRA.[2] Antiplatelet therapy and aggressive control of vascular risk factors may help in patients who are not surgical candidates.

Conclusion: This case highlights the importance of early diagnosis, advanced imaging, and prompt intervention for preventing recurrence, preserving function and improving neurological outcomes of Moyamoya Disease. The primary objective of treatment is to enhance cerebral perfusion and reduce ischemic risk, thereby mitigating progressive neurological deficits.

Keywords: Case report, Moyamoya disease, ischemic stroke, cerebrovascular disorder, collateral vessel, aphasia

OVERLAPPING SYMPTOMS BETWEEN CEREBRAL VENOUS SINUS THROMBOSIS AND CERVICAL DISC PROTRUSION: A DIAGNOSTIC CHALLENGE

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Introduction: Cerebral venous sinus thrombosis (CVST) is a cerebrovascular disorder that can present with a wide range of clinical manifestations and is associated with substantial morbidity and mortality. Headache is the most common symptom, but sometimes CVST has nonspecific symptoms that may lead to misdiagnosis as a primary headache. Overlapping with another condition that produce similar symptoms will make it more difficult to ensure the diagnosis.

Case Report: A 39-year-old woman presented with a two-year history of intermittent headache at the back of the head. Sometimes it radiates to the left shoulder, accompanied by intermittent vertigo, transient blurred vision and frequent left arm cramps. There were no abnormalities from the neurological physical examination. Cervical and brain MRI were performed, but the results showed no abnormalities that could explain the headache. MRI result could only explain the radiating pain. Therefore, Digital subtraction angiography (DSA) was performed and it revealed thrombosis in superior sagittal sinus. The patient was then treated with oral anticoagulants, which resulted in significant improvement.

Discussion: Headache is the most common symptom in CVST. The other clinical manifestations may vary depending on the location of the thrombosis. Incidences of CVT are highest in younger women, with both oral contraception and pregnancy as the major risk factors. In this case, the patient has a risk factor of female gender. Moreover, the symptoms were initially experienced during her second pregnancy. In circumstances where headaches are accompanied by symptoms of cervical HNP, the diagnosis becomes more difficult to establish.

Conclusion: CVST should be considered in patients with atypical headaches especially for those who had the risk factors of CVST. Multiple diagnostic modalities are required to ensure the diagnosis, as patients may present with coexisting conditions that show overlapping symptoms. Early diagnosis enables prompt treatment and a satisfactory clinical outcome.

Keywords: CVST, SSS thrombosis, anticoagulation therapy, headache

BEYOND HEMIPARESIS: A COMPLEX CASE REPORT OF THROMBOEMBOLIC STROKE IN UNTREATED CARDIOVASCULAR DISEASE WITH SYSTEMIC COMPLICATIONS

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Introduction: Ischemic stroke in young adults should prompt a thorough search for underlying etiologies. Cardioembolic sources, particularly from untreated heart failure, may lead not only to stroke but also to complex multisystem deterioration. This report highlights the neurological and systemic challenges in managing such a case.

Case Report: A 42-year-old man with a history of untreated hypertension and heart failure presented with sudden right hemiparesis. Neurological examination showed cranial nerve VII and XII palsies and flaccid hemiparesis (grade 1). Brain CT revealed thromboembolic infarction in the left temporoparietal lobe. Echocardiography showed severely reduced LVEF (17%). During hospitalization, systemic deterioration ensued—edema, gross hematuria, fever, and hospital-acquired pneumonia. Coagulation profiles showed markedly elevated D-dimer (>10,000 µg/L) with normal PT, APTT, and INR. Fibrinogen was not assessed due to resource limitations. Disseminated intravascular coagulation (DIC) was suspected but could not be confirmed definitively.

Discussion: This case demonstrates a cardioembolic stroke as the initial manifestation of progressive systemic collapse. While initial management prioritized neurological stabilization, evolving systemic findings demanded multidisciplinary intervention. The absence of fibrinogen measurement limited DIC confirmation, yet clinical features suggest evolving coagulopathy, potentially triggered by sepsis from hospital-acquired pneumonia. Neurological prognosis was further complicated by hemodynamic instability and metabolic disturbances.

Conclusion: This case emphasizes the importance of early neurological recognition in stroke with systemic origin, particularly from cardiac dysfunction. Comprehensive evaluation of cardio-neurovascular interactions, close infection control, and complete coagulation workups—including fibrinogen—are crucial for timely diagnosis and outcome improvement.

Keywords: Stroke, Cardioembolic, Heart failure, Neurology, DIC

SPONTANEOUS TENTORIAL SUBDURAL HEMORRHAGE WITH TERSON SYNDROME IN A PATIENT WITH IMMUNE THROMBOCYTOPENIC PURPURA: A RARE CASE REPORT

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Introduction: Subdural hemorrhage (SDH) is the accumulation of blood in the subdural space due to rupture of bridging veins, typically along the lateral cerebral hemispheres and temporal regions. Spontaneous SDH involving the tentorium cerebelli is rare and may be associated with coagulation disorders such as immune thrombocytopenic purpura (ITP). Intracranial hemorrhage can also lead to Terson syndrome, a rare intraocular hemorrhage secondary to elevated intracranial pressure.

Case Description: We report a case of a 37-year-old woman with a history of ITP presented with a two-week history of worsening headache and blurred vision. She was on Eltrombopag and Mycophenolate mofetil. Examination revealed left lateral gaze palsy, diplopia, subconjunctival hemorrhage, gingival bleeding, and hematomas on the extremities. Fundoscopy showed bilateral papilledema. Laboratory findings revealed severe thrombocytopenia (15,000/µL). Non-contrast head CT revealed a thin SDH over the tentorium cerebelli, while MRI/MRA confirmed bilateral posterior fossa SDH without vascular malformation.

Discussion: In adults with ITP, spontaneous intracranial hemorrhage is rare but serious, occurring in approximately 1.4% of cases. The absence of aneurysm or arteriovenous malformation supports the diagnosis of ITP-related hemorrhage. The presence of Terson syndrome, presenting with visual impairment and intraocular hemorrhage, further indicates raised intracranial pressure. Surgical intervention was not indicated. The patient was managed conservatively with Immunosuppressive theraphy (Methylprednisolone and Mycophenolate mofetil), and Eltrombopag to stimulate platelet production, preventing further bleeding. Corticosteroids also contributed reducing inflammation and intracranial pressure. Terson syndrome was managed conservatively, as intraocular bleeding often resolves spontaneously. Conservative management of SDH includes intracranial pressure control, pain management, and monitoring for deterioration that may necessitate surgical intervention.

Conclusion: This case illustrates a rare but significant coexistence of spontaneous tentorial SDH and Terson syndrome in an ITP patient. Early recognition and appropiate conservative management targeting the underlying thrombocytopenia are essential to prevent further complications.

Keywords: Spontaneous Tentorial Subdural Hemorrhage, Terson Syndrome, Immune Thrombocytopenic Purpura

RIGHT-SIDED HEMISPATIAL NEGLECT AND SENSORY APHASIA DUE TO LEFT BRAIN DAMAGE IN PATIENT WITH STROKE: A RARE CASE REPORT

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Introduction: Hemispatial neglect is condition of inability to orientate, to report, or to respond a contralesional stimulus. Hemispatial neglect mostly caused by stroke, but several pathological processes also can caused it, including neurodegenerative disease, neoplasia, and trauma. Prevalence of hemispatial neglect caused by right brain lesion is greater than left brain lesion (42% versus 8%).

Case Description: A 72-year-old male presented with a sudden onset of incoherent speech since last night before admission. This was accompanied by weakness on the right side of the body. Ten years ago, patient experienced his mouth was deviated to one side, but he did not seek medical treatment. Hypertension was diagnosed two years ago, but he has not been taking his medication regularly. On examination, the patient did not respond when called from the right side, but he was responsive when called from the left. Additionally, patient was able to speak fluently but could not form meaningful sentences, could not repeat words, and was unable to naming. The patient was diagnosed ischemic stroke with right-sided hemispatial neglect and sensory aphasia.

Discussion: In this case, damage of left cerebral hemisphere result sensory aphasia and right-sided hemispatial neglect. Lesions in the posterior parietal lobe (including inferior parietal lobe), temporoparietal junction, superior and middle temporal gyri, and prefrontal and premotor cortex, are associated with contralateral neglect. Additionally, lesions involving the white matter fiber tracts and subcortical nuclei can also result in neglect, even in the absence of left–right asymmetry. The patient's aphasia is attributed to damage in Wernicke's area, located in the posterior part of the superior temporal gyrus.

Conclusion: patient with left temporo-parietal lobe damage also can caused hemispatial neglect with sensory aphasia.

Key word: right-sided hemispatial neglect, aphasia, stroke

PATTERNS OF COGNITIVE DECLINE AND ASSOCIATED NEUROIMAGING FINDINGS IN CEREBRAL SMALL VESSEL DISEASE: A CASE SERIES

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Introduction: Cerebral small vessel disease (cSVD) is a major contributor to cognitive impairment, accounting for approximately 50%–70% of cases. This case series describes four patients with radiologically confirmed cSVD to illustrate the variability of cognitive impairment associated with the condition.

Case Description: Four patients diagnosed with cerebral small vessel disease (cSVD) underwent cognitive and neuroimaging evaluations to assess the pattern of cognitive impairment. Brain MRI revealed white matter hyperintensities (WMH) consistent with Fazekas grades 1–2 in all patients. In the first case, additional enlarged perivascular spaces (EPVS) were observed in the centrum semiovale and bilateral frontoparietal subcortical regions. Cognitive assessments using the MoCA-Ina, TMT-A, and TMT-B identified varied deficits. The first patient, a 59-year-old male, demonstrated impairments in memory, executive function, and attention. The second, a 56-year-old female, exhibited deficits in memory, executive function, attention, visuoconstruction, and language. The third, a 52-year-old female, showed isolated memory impairment. The fourth, a 60-year-old male, presented with impairments in memory, executive function, attention, and language.

Discussion: This case series illustrates how structural changes in cSVD, particularly WMH and EPVS, are related to cognitive dysfunction. WMH were observed in all patients and were associated with impairments in memory, attention, and executive function, which are commonly affected due to disruption of fronto subcortical networks. One patient also presented with EPVS in the centrum semiovale and frontoparietal subcortical regions, along with similar cognitive deficits. Although the effects of EPVS in these areas are not fully understood, they may contribute to cognitive decline. These findings underscore the complex and heterogeneous nature of cSVD-related cognitive decline.

Conclusion: Cerebral small vessel disease contributes to cognitive impairment, particularly affecting memory, attention and executive function. Given the lack of specific treatments, early identification and preventive strategies are critical to managing disease progression.

Keywords: Cerebral Small Vessel Disease, Cognitive Impairment, White Matter Hyperintensities, Enlarged Perivascular Spaces, Ischemic Stroke

ACUTE ISCHEMIC STROKE AS A COMPLICATION OF DENGUE FEVER: A CASE REPORT

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Introduction: Neurological manifestations can occur in patients with dengue fever. However, ischemic stroke is a highly rare complication.

Case Description: We report a 62-year-old man with the sudden onset of slurred speech and right-sided weakness (muscle strength 4/5 on the Medical Research Council [MRC] scale), which occurred during his hospitalization for dengue fever. The patient has been treated for dengue fever, with prior complaints of fever, headache, and muscle and joint pain, since 5 days ago. There was a history of risk factors, including uncontrolled hypertension and type 2 diabetes mellitus. Serial laboratory results showed a low platelet count of 87,000/µL and increased hematocrit levels. A non-contrast brain CT-Scan showed lacunar infarction in the left lentiform nucleus. The patient was given symptomatic management for clinical dengue fever. Along with improvement in platelet counts, antiplatelet administration was administered for the ischemic stroke. The patient was discharged with a modified Rankin Scale score of 2.

Discussion: Stroke in dengue fever is a rare occurrence. The presence of stroke risk factors, age >60 years, and male gender, place patients with dengue fever at a higher risk of ischemic stroke. The pathogenic mechanism of ischemic stroke related to dengue fever is still unclear. Immune-mediated arteritis and a transient hypercoagulable state are stipulated to play a role in the process. There is no specific consensus in the management of ischemic stroke in dengue fever. Supportive management is given according to the patient's clinical condition.

Conclusion: Patients with risk factors have a higher chance of experiencing ischemic stroke as a complication of dengue fever. Further studies are needed regarding the pathogenic mechanism and epidemiology of ischemic stroke in dengue fever cases, as well as for determining its optimal management.

Keywords: dengue fever, ischemic stroke, thrombocytopenia

FROM CARDIAC VEGETATION TO EMBOLIC STROKE: A CLINICAL CASE REPORT OF RAPID NEUROLOGICAL DETERIORATION IN STROKE PATIENT WITH *ENTEROCOCCAL* INFECTIVE ENDOCARDITIS

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Introduction: Cerebral emboli occur in 40-50% of patients with infective endocarditis (IE). Endocardial infection triggers thrombus formation, and when the vegetations break down it can cause embolization in intracerebral arteries. This case report highlights an IE case with rapid neurological deficits in embolic stroke.

Case Description: A 49-year-old man came with sudden-onset dysarthria, left hemiparesis, and headache. Initial cerebral CT-Scan showed hypodense lesions suggestive of ischemic infarction in the right temporoparietal lobe and cerebellum. In the following week, with

antiplatelet and physiotherapy, his speech improved and gradually regained strength in his left limbs. Two weeks post hospitalization, he returned with decreased consciousness and fever. Laboratory findings showed leukocytosis. Second cerebral CT-Scan revealed subacute ischemic thrombo-embolic infarction in temporoparietal lobe and chronic infarction in cerebellum. Echocardiography confirmed aortic regurgitation with vegetation on right coronary cuspid (RCC) and non-coronary cuspid (NCC). Blood cultures were taken and it came back positive for Enterococcus faecalis. Thus, patient was treated with dual antibiotics of ampicillin and ceftriaxone.

Discussion: Infective endocarditis is often underdiagnosed in embolic stroke, despite its high reported incidence rate. In embolic stroke patients presenting with fever, IE should be considered to avoid delayed diagnosis.

Conclusion: This patient exhibited rapid neurological deficit in just 2 weeks prior to his first hospitalization due to acute embolic stroke caused by Enterococcal IE. Typically, endocarditis is only considered as the cause of embolic stroke after more common causes have been excluded, causing diagnostic delay. Timely diagnosis and targeted antibiotics therapy are necessary to reduce poor prognosis outcomes.

Keywords: Embolic, Infective endocarditis, Stroke

VERTEBROBASILAR STENOSIS AS A CULPRIT OF POSTERIOR CIRCULATION STROKE: AN EVIDENCE-BASED CASE REPORT

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Introduction: Posterior circulation stroke affects the vertebrobasilar (VB) perfusion territory. Although less common than anterior circulation strokes, it often results in significant morbidity and functional impairment. Accurate identification of the underlying etiology is crucial for targeted management and prevention of recurrence.

Case Description: We present a case involving a 46-year-old male with intermittent, progressively worsening dizziness for 30 days. Eight days before admission, he developed acute left-sided weakness, followed by slurred speech and tingling sensations five days prior. On examination, he reported diplopia. Neurological findings included left hemiparesis, right unidirectional fast-phase nystagmus, central paresis of the left cranial nerves VI, VII, and XII, and dysarthria. Laboratory tests revealed dyslipidemia. MRI/MRA imaging showed severe stenosis in the intracranial segments of both vertebral arteries (V4) and the right posterior inferior cerebellar artery (PICA), with signal loss predominantly on the right side.

Discussion: Evidence suggests that vertebrobasilar stenosis, most commonly caused by atherosclerosis, increases the risk of posterior circulation stroke by 3.4–4.2 times. The patient had several risk factors, including uncontrolled hypertension, smoking, and dyslipidemia, with no other evident causes of VB stenosis. His clinical presentation was consistent with ischemia in the posterior circulation territory.

Conclusion: Vertebrobasilar stenosis is a significant risk factor for posterior circulation stroke. Early detection and management of underlying vascular pathology are essential to reduce stroke incidence and improve patient outcomes.

Keywords: Vertebrobasilar, Stenosis, Stroke, Posterior Circulation

SUBARACHNOID HEMORRHAGE FROM RUPTURED MYCOTIC ANEURYSMS IN TETRALOGY OF FALLOT PEDIATRIC PATIENT

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Introduction. Hemorrhagic stroke in children is a rare condition but carries significant morbidity and mortality. The incidence of non-traumatic subarachnoid hemorrhage (SAH) and intracerebral hemorrhage (ICH) in children is reported at 0.4 and 0.8 per 100,000 per year, respectively, and is mostly associated with secondary causes such as vascular malformations, central nervous system infections, and congenital heart disease.Tetralogy of Fallot (TOF) is one of the most common cyanotic congenital heart defects and is known to increase the risk of neurological complications, including stroke. One such complication is mycotic aneurysm, a localized arterial dilation caused by infectious damage to the vessel wall. Although rare in children, mycotic aneurysms have a high risk of spontaneous rupture, potentially leading to SAH and fatal outcomes.

Case Description. A 10-year-old boy with a known history of (TOF) presented with a 16-day history of sudden, stabbing frontal headache and two episodes of generalized tonic-clonic seizures without fever or trauma. Echocardiography confirmed TOF with moderate tricuspid and pulmonary regurgitation, and right heart dilation. Head CT revealed subarachnoid hemorrhage (SAH). Cerebral angiography showed a beaded appearance in multiple cerebral arteries, suggesting vasculitis and mycotic aneurysms.

Discussion. This case involves a 10-year-old with Tetralogy of Fallot who developed subarachnoid hemorrhage (SAH) due to ruptured mycotic aneurysms. Early diagnosis and DSA played a key role in identifying the aneurysms. Six-month follow-up was planned to evaluate treatment response and risk of rebleeding.

Conclusion: Pediatric stroke, particularly (SAH), has distinctive clinical and radiological characteristics and is often caused by secondary etiologies such as congenital heart defects. Mycotic aneurysms in children are rare, but very dangerous as they have a high risk of spontaneous rupture. Early diagnosis through DSA is crucial, and initial therapy includes antibiotics, blood pressure control, and seizure management and other neuroprotectives.

Keywords: Subarachnoid hemorhage, Mycotic Aneurysme, Tetaralogy Of Fallot (TOF)

SYNERGISTIC EFFECTS OF RTMS, BRAINWAVE ENTRAINMENT, AND DRY NEEDLING IN ISCHEMIC STROKE RECOVERY: A CASE STUDY

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Introduction: Ischemic stroke is a leading cause of global disability, often resulting in persistent motor and cognitive impairments. Recent advances in neurorehabilitation emphasize multimodal approaches to enhance neuroplasticity. This case report explores the clinical effects of combining Repetitive Transcranial Magnetic Stimulation (rTMS), Brainwave Entrainment (BWE), and Dry Needling (DN) for post-stroke recovery.

Case Report: A 46-year-old male presented with right-sided hemiparesis and dysarthria one year post-ischemic stroke. Clinical evaluation and quantitative EEG (qEEG) revealed persistent motor deficits and cerebral wave asymmetry. A tailored rehabilitation program incorporating rTMS targeting motor and prefrontal areas, BWE using alpha-frequency binaural beats, and DN to alleviate spasticity was administered. After two cycles of intervention, the patient demonstrated improvements in muscle tone (Modified Ashworth Scale reduced from 2 to 1+) and motor coordination. qEEG analysis showed neurophysiological changes consistent with cortical reorganization.

Conclusion: This case underscores the potential of integrating rTMS, BWE, and DN in stroke rehabilitation. The multimodal approach facilitated functional and neurophysiological improvements, suggesting its value in enhancing recovery pathways for chronic stroke patients.

Keywords: Ischemic Stroke, Neurorehabilitation, Repetitive Transcranial Magnetic Stimulation, Brainwave Entrainment, Dry Needling, qEEG, Modified Ashworth Scale

NINE SYNDROME FOLLOWING ACUTE BRAINSTEM INFARCTION: A CASE REPORT AND NEUROANATOMICAL INSIGHT

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Introduction: Nine Syndrome is a complex variant of one-and-a-half syndrome. It is characterized by a combination of ipsilateral internuclear ophthalmoplegia and conjugate horizontal gaze palsy, accompanied by ipsilateral facial nerve palsy, contralateral hemiparesis, and

hemihypesthesia. This case report discusses the clinical features, neuroimaging findings, and neuroanatomical insights associated with this rare brainstem syndrome.

Case Report: A 51-year-old male presented with a sudden onset of binocular diplopia for three hours, followed by deviation of the mouth to the left and weakness on the left side of his body. His medical history included poorly controlled hypertension, diabetes mellitus and a smoker. Physical examination revealed hypertension, obesity, horizontal gaze palsy to the right in both eyes, right-sided internuclear ophthalmoplegia, right nuclear facial nerve paresis, left hemiparesis and hemihypesthesia. MRI-MRA of the brain showed acute infarction in the right pons and left cerebellum with intraluminal thrombus at the basilar artery and right vertebral artery. Craniocervical DSA revealed stenosis of the right and left vertebral arteries. The patient was diagnosed with Nine Syndrome secondary to brainstem infarction. The patient was managed conservatively, and symptoms improved after 12 days of evaluation.

Discussion: Conjugate eye movement relies on the integrated function of the paramedian pontine reticular formation and the medial longitudinal fasciculus, both located in the pons. Lesions in this area can result in internuclear ophthalmoplegia (INO), wall-eyed bilateral INO, and One-and-a-Half Syndrome. When the lesion extends to involve the facial nerve nucleus, medial lemniscus, and corticospinal tract, it results in ipsilateral facial palsy and contralateral hemiparesis and hemihypesthesia (1½ + VII + ½ = IX), manifesting as Nine Syndrome. The most common etiologies include brainstem infarction and demyelinating diseases.

Conclusion: In this case, Nine Syndrome resulted from a pontine infarction. Accurate lesion localization relies on thorough neurological examination and knowledge of brainstem anatomy.

Keywords: horizontal gaze palsy, internuclear ophthalmoplegia, Nine Syndrome

A RARE THERAPEUTIC DILEMMA: THROMBOLYSIS IN ISCHEMIC STROKE WITH CONCURRENT INTRACRANIAL EPIDURAL ABSCESS

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Introduction: Stroke is a sudden-onset neurological deficit caused by interruption of cerebral blood flow. Intravenous thrombolysis with recombinant tissue plasminogen activator (r-tPA) is the gold standard treatment for acute ischemic stroke. However, its use is limited to a small proportion of patients (2–8.5%) due to contraindications or late presentation. Intracranial epidural abscess (ICEA) is a rare but potentially life-threatening infection that can result in severe neurological complications.

Case Description: We report a case of a 50-year-old Asian male who presented with acute aphasia and right-sided weakness, which began 2 hours prior to admission. He also exhibited slurred speech and irrelevant response pattern. His history included burr hole surgery and osteoplasty 20 years earlier for a post-traumatic hematoma, and he had experienced persistent purulent discharge from the left side of his head for the past 5 years. On examination, his Glasgow Coma Scale (GCS) was 4X6 (sensory aphasia), and his NIH Stroke Scale (NIHSS) score was 10. Imaging showed no evidence of hemorrhage but revealed a surgical defect, pneumocephalus, encephalomalacia, and soft tissue swelling. Intravenous thrombolysis was administered 3 hours and 5 minutes after symptom onset. Within 24 hours, his NIHSS score improved markedly from 10 to 1.

Discussion: Thrombolysis can be beneficial in acute ischemic stroke even in complex cases with comorbidities such as ICEA. Careful evaluation, timely intervention, and close monitoring are essential to ensure safety and optimize outcomes.

Conclusion: This case highlights that intravenous thrombolysis may be safely and effectively performed in acute ischemic stroke, even when complicated by a coexisting intracranial epidural abscess, with proper clinical judgment.

Keyword: Intracranial epidural abscess, intravenous trombolysis, r-TPA, stroke

INTRACEREBRAL HAEMORRHAGE AS A RARE COMPLICATION OF SUPERIMPOSED PREECLAMPSIA: A CASE REPORT

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Introduction: Approximately 35.29% of women diagnosed with intracerebral haemorrhage (ICH) also present with preeclampsia or eclampsia. Intracerebral haemorrhage (ICH) is a rare but severe complication of preeclampsia, significantly contributing to maternal morbidity and mortality. Patients with superimposed preeclampsia have about a 2.97-fold increased risk of haemorrhagic stroke compared to those without these conditions. This study aims to describe the risk factors, diagnostic approach, and management of hypertension-related ICH during pregnancy.

Case Report: A 42-year-old woman at 26 weeks and 4 days of gestation, with a 7-year history of chronic hypertension, presented with superimposed preeclampsia complicated by ICH. She complained of a severe headache and left-sided weakness, with blood pressure of 209/115 mmHg and positive proteinuria. CT angiography revealed a 50 cc hyperdense lesion in the right cortical lobe with midline shift, without signs of vascular malformation. Conservative treatment with magnesium sulfate, nicardipine, and mannitol was initiated. Due to maternal acute kidney injury, an emergency cesarean section was performed. Eleven days after onset, the patient experienced neurological deterioration and an increase in hematoma volume. She underwent decompressive craniectomy and evacuation of the hematoma. After 18 days of hospitalization, she showed improvement in both Glasgow Coma Scale and Modified Rankin Scale and was discharged in a stable condition.

Discussion: This case highlights preeclampsia as a significant risk factor for ICH, especially in patients with chronic hypertension. Early recognition and management are essential to achieve favorable neurological and functional outcomes. A multidisciplinary approach involving obstetricians, neurologists, neurosurgeons, and intensive care specialists is crucial for optimizing maternal prognosis.

Conclusion: Effective management of ICH and preeclampsia requires a multidisciplinary strategy. Early diagnosis and prompt intervention are associated with reduced maternal morbidity and mortality.

Keywords: intracerebral hemorrhage, chronic hypertension, superimposed preeclampsia, conservative management, decompressive craniectomy

WHERE BLOOD SPOKE TWO TRUTHS: RUPTURED LARGE POSTERIOR INFERIOR CEREBELLAR ARTERY SACCULAR ANEURYSM MIMICKING INTRAPARENCHYMAL CEREBELLAR HEMORRHAGE IN A 39-YEAR OLD FILIPINO FEMALE: A CASE REPORT

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Introduction: An aneurysm arising from the posterior inferior cerebellar artery (PICA) is rare accounting for 0.5% to 3% of all intracranial aneurysms. This type of aneurysm can pose significant diagnostic challenges, particularly when initial imaging mimics a primary intraparenchymal hemorrhage.

Case Description: We report the case of a 39-year-old female patient who presented in the emergency department with sudden-onset severe nuchal pain, headache, and loss of consciousness. A non-contrast CT scan initially showed left cerebellar intraparenchymal hemorrhage, acute subarachnoid hemorrhage, and mild acute hydrocephalus. Subsequent CT Angiography revealed a wide neck saccular aneurysm with multiple

daughter sacs in the left PICA. The patient underwent successful endovascular coiling with complete resolution of symptoms.

Discussion: This case is highlighted by its atypical imaging findings and a paradoxical, favorable outcome that contrasts with the generally poorer prognosis for ruptured PICA aneurysms. Despite having unfavorable morphological features (large size and multiple daughter sacs) and a significant hemorrhage grade, the patient's complete recovery underscores that individualized and aggressive medical management–including prompt endovascular intervention—can overcome these challenges. This case depicts that while disease factors like anatomy and aneurysm morphology are critical, patient-specific factors and timely intervention are paramount in determining the final outcome.

Conclusion: Ruptured large PICA aneurysms can be a clinical diagnostic dilemma especially when it presents initially as an intraparenchymal hemorrhage. This case emphasizes the vital role of CT angiography to provide accurate diagnosis ultimately guiding timely intervention that would impact patient outcomes. It is essential to have a high index of suspicion for ruptured aneurysms, especially in younger patients without major comorbidities who present with atypical cerebellar hemorrhage.

Keywords: PICA aneurysm, posterior circulation, cerebellar hemorrhage, aneurysmal rupture, CT angiography, endovascular coiling, case report

DIAGNOSTIC AND MANAGEMENT STRATEGIES FOR CEREBROVASCULAR FIBROMUSCULAR DYSPLASIA: A CASE REPORT

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Introduction: Fibromuscular dysplasia (FMD) is a non-atherosclerotic and non-inflammatory vascular disorder characterized by abnormal cellular proliferation within the arterial wall. It most commonly affects the renal arteries (58%), the extracranial segment of the internal carotid arteries (32%), and the vertebral arteries. The etiology and prevalence of FMD in the general population remain incompletely understood.

Case Description: A 31-year-old Javanese woman presented with a pulsatile mass on the right side of her neck that synchronized with her heartbeat, approximately the size of a chicken egg. The mass was non-tender and had remained stable for the past 19 years. The patient also reported intermittent, mild, throbbing headaches on the right side for the last nine years, which did not affect her daily activities or sleep. On auscultation, a bruit was detected over the mass, and no focal neurological deficits were observed. CTA and DSA revealed multifocal FMD involving the common carotid artery, extending to the intracranial segment of the right internal carotid artery (RICA) and from the extracranial to the intracranial segment of the left internal carotid artery (LICA). This was accompanied by a saccular pseudoaneurysm of the right common carotid artery (RCCA) and fusiform dissecting aneurysms of both internal carotid arteries.

Discussion: This patient's fibromuscular dysplasia (FMD) diagnosis was established based on key clinical signs and imaging findings. Advanced vascular imaging was conducted to detect additional lesions and hidden abnormalities early. Management included medical therapy and endovascular interventions, such as angioplasty, stenting, or coiling, depending on the type and location of the lesion, the severity of symptoms, and the patient's overall clinical condition. Balloon test occlusion (BTO) was used to assess ischemic tolerance before sacrificing the internal carotid artery (ICA), aiming to reduce the risk of neurological complications.

Conclusion: We report a diagnostic and therapeutic strategy for multifocal cerebrovascular fibromuscular dysplasia (FMD) in a young female patient, based on clinical assessment and imaging findings from CTA and DSA. The initial plan to sacrifice the right internal carotid artery (RICA) was abandoned following a negative result on balloon test occlusion. As an alternative, RICA reconstruction was proposed using a flow-diverting stent in combination with telescopic carotid stenting, targeting bilateral fusiform dissecting aneurysms of the internal carotid arteries. While awaiting the planned endovascular intervention, the patient was maintained on a daily regimen of 80 mg aspirin to mitigate the risk of thrombotic and embolic complications.

Keywords: Fibromuscular dysplasia, Balloon test occlusion, RICA sacrifice, saccular pseudoaneurysm, fusiform dissecting aneurysm

A CASE OF SIMULTANEOUS INFARCT AND HEMORRHAGIC STROKE IN SYSTEMIC LUPUS ERYTHEMATOSUS: A CASE REPORT

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Introduction: Stroke cases in young adults present a diagnostic challenge, particularly when associated with autoimmune conditions. This case report tells about a rare case of intracerebral hemorrhage (ICH) and subarachnoid hemorrhage (SAH) with Infarct Stroke in late in a young woman with underlying autoimmune vasculitis.

Case Description: A 22-year-old woman developed slowly progressive weakness of limbs over a period of 1 year, which then progressed to quadriparesis over 2 months. She presented later with left sided chronic headache and focal seizures. The neurological examination showed tetraparesis, ophthalmoplegia, and intracranial hypertension. The first neuroimaging showed ICH in the occipital area with SAH, later proved to be due to an ICA aneurysm in the context of a suspected autoimmune arteritis. Laboratory finding revealed anaemia, electrolyte imbalances and hypercoagulability. The patient was comatose and developed lateralizing signs.

Discussion: The patient was treated with neurointensive care using anticonvulsants, osmotic therapy, and immunotherapy. Despite initial improvement, she deteriorated neurologically, and repeat imaging demonstrated malignant cerebral infarction with midline shift. She was diagnosed with malignant infarction after ICH and SAH, which was presumed to be due to SLE-related vasculitis.

Conclusions: This case highlights the need to consider autoimmunity associated vasculopathies in the differential diagnosis of young-onset stroke. A multidisciplinary collaboration with neurology, rheumatology and intensive care is a prerequisite for better patient outcomes.

Keywords: Intracerebral hemorrhage, Subarachnoid hemorrhage, Autoimmune vasculitis, Stroke, Systemic lupus erythematosus, Seizure

FATAL MULTIPLE INTRACRANIAL HEMORRHAGES AFTER INTENSE EXERCISE IN A YOUNG ADULT: A CASE REPORT

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Background: Spontaneous intracerebral hemorrhage (ICH) and subarachnoid hemorrhage (SAH) are rare events in young adults, particularly when triggered by strenuous physical activity. Intense exercise can cause sudden elevations in systemic blood pressure and intracranial pressure, potentially leading to severe cerebrovascular complications, especially in individuals with undiagnosed vascular abnormalities.

Case Description: A previously healthy 26-year-old man experienced sudden loss of consciousness after an intense workout at the gym. Upon arrival at the emergency department, his Glasgow Coma Scale (GCS) score was 6. A non-contrast head CT scan revealed multiple spontaneous subarachnoid hemorrhages, intracerebral hemorrhage, and subdural hematoma without any signs of trauma. The patient was admitted to the intensive care unit (ICU) for close monitoring and supportive care. Despite maximal therapy, his neurological condition progressively deteriorated, and he passed away on the third day of hospitalization.

Discussion: The mechanism behind exercise-induced intracranial hemorrhage remains poorly understood but is believed to involve sudden hemodynamic stress. Individuals with undetected vascular abnormalities such as arteriovenous malformations (AVMs) or aneurysms may be at increased risk. In this case, the absence of trauma or comorbidities supports the hypothesis that physical exertion was the primary trigger.

Rapid diagnosis using neuroimaging is essential to assess the extent and location of bleeding and to evaluate potential interventions. However, in cases of multifocal hemorrhage with rapid neurological decline, therapeutic options are limited and prognosis is poor. Increased clinical awareness and prompt evaluation are critical, particularly in young patients presenting with acute neurological symptoms following intense physical activity.

Conclusion: Strenuous exercise can precipitate fatal intracranial hemorrhage even in young, previously healthy individuals. Early diagnosis and intensive management are essential, but outcomes remain poor in cases involving multiple hemorrhage sites and rapid neurological deterioration.

Keywords: Intracranial haemorrhage, Strenuous exercise, Young adult

CEREBRAL SMALL VESSEL DISEASE AS AN PRECIPITATING AND AGGRAVATING FACTOR IN DEPRESSION: TWO CASES WITH DISTINCT ONSET PATTERNS

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Introduction: Cerebral small vessel disease (CSVD) is increasingly associated with neuropsychiatric symptoms, particularly depression. However, the clinical significance of CSVD in depression remains insufficiently understood. This report describes two female patients with CSVD and moderate depressive disorder, illustrating differing onset patterns and treatment responses.

Case Description: Two female patients diagnosed with CSVD and moderate depressive disorder were assessed using the Montgomery–Åsberg Depression Rating Scale (MADRS). **Case 1:** A 57-year-old developed depressive symptoms one year after CSVD diagnosis confirmed by MRI findings showing white matter hyperintensities consistent with Fazekas grade 1. She was treated with amitriptyline 25 mg once daily, with MADRS improving from 18 to 11 after two months of treatment. **Case 2:** A 52-year-old presented with depressive symptoms one year prior to CSVD diagnosis confirmed by MRI findings showing white matter hyperintensities consistent with Fazekas grade 1. Despite treatment with sertraline 25 mg once daily, clobazam 5mg twice daily, and lorazepam 0,5 mg once daily, her MADRS worsened from 20 to 32 over two years.

Discussion: This study supports the evidence that CSVD may both act as an precipitating and aggravating factor in depressive disorders. The primary mechanism by which CSVD contributes to depression involves disruption of the corticostriatal–pallidum–thalamocortical circuit by white matter hyperintensities, leading to decreased levels of noradrenergic and serotonergic. Untreated CSVD will increase the volume of white matter hyperintensities and cause more extensive tissue damage, which can worsen depression symptoms. Some studies also suggest CSVD is associated with antidepressant treatment resistance, potentially resulting in poorer depression outcomes.

Conclusion: CSVD may contribute to the onset or worsening of depressive symptoms and influence treatment outcomes. Effective management of CSVD progression may reduce the risk of depression and limit depression symptom severity.

Keywords: Cerebral Small Vessel Disease; Depression; White Matter Hyperintensitie

SECONDARY FAHR SYNDROME FOLLOWING THYROIDECTOMY: A CASE REPORT

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Introduction: Fahr syndrome is a rare neurological disorder characterized by symmetrical calcification of the basal ganglia and other brain regions. It may be associated with various metabolic disturbances, especially hypocalcemia following thyroid surgery. Early diagnosis and appropriate management are essential to prevent clinical deterioration.

Case Description: A 58-year-old Balinese woman with a history of total thyroidectomy 15 years ago presented with progressive vertigo, imbalance, kinetic tremor, and cognitive decline over three months. Neurological examination revealed bilateral kinetic tremor, impaired coordination, positive Romberg sign, and postural instability. Cognitive assessment using the MoCA-Ina scored 21/30, indicating cognitive impairment, while the HDRS scored 8, indicating mild depression. Laboratory findings showed subclinical hypothyroidism and hypocalcemia. Brain CT scan revealed symmetric calcifications in the basal ganglia and cerebellum, consistent with Fahr syndrome. A diagnosis of secondary Fahr syndrome due to chronic hypocalcemia post-thyroidectomy was established.

Discussion: Fahr syndrome can present with a wide range of neurological and psychiatric manifestations, including movement disorders, cognitive dysfunction, and mood disturbances. In this patient, chronic hypocalcemia following thyroidectomy was the underlying cause. The basal ganglia are particularly susceptible to calcium deposition due to their metabolic and vascular characteristics. Timely neuroimaging and metabolic evaluation are critical for diagnosis.

Conclusion: Secondary Fahr syndrome is a potentially preventable complication of thyroid surgery. Long-term monitoring and proper management of metabolic parameters, particularly calcium and thyroid hormone levels, are crucial in patients post-thyroidectomy. Interdisciplinary care and early intervention may improve outcomes and quality of life.

Keywords: Fahr syndrome, hypocalcemia, thyroidectomy, basal ganglia, neuroimaging

HEMORRHAGIC TRANSFORMATION STROKE IN ATRIAL FIBRILLATION PATIENT

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Introduction: Atrial fibrillation (AF) increases the risk of ischemic stroke due to cardioembolic events. Anticoagulation therapy serves as a preventive measure against ischemic stroke in patients with AF. However, it also increases the risk of hemorrhagic transformation (HT), which can worsen clinical outcomes and elevate mortality rates. Managing anticoagulation in the context of HT presents a significant clinical dilemma. This case report discusses HT in a patient with AF who received anticoagulant therapy.

Case Description: A 54-year-old woman presented with left-sided limb weakness, severe headache, and decreased consciousness. She had a history of uncontrolled hypertension. On examination, blood pressure was 200/105 mmHg, pulse 108 x/minute (irregular), Montreal Cognitive Assessment-Indonesian (MoCA-Ina) score 19/30 indicating vascular cognitive impairment. Laboratory tests revealed dyslipidemia, International Normalized Ratio (INR) 4.2, and Partial Thromboplastin Time (PTT) 18 seconds (prolonged). Electrocardiography showed atrial fibrillation. Head Computed Tomography (CT) scan revealed intracranial hemorrhage measuring 18.5 cc in the external capsule and right lentiform nucleus with perifocal edema and old infarction in the left internal capsule. Based on these findings, the patient was diagnosed with HT stroke. Appropriate treatment was administered, and the patient was discharged from the hospital with minimal disability.

Discussion: HT is a complication of ischemic stroke occurring in AF patients on anticoagulation. Its risk factors are related to advanced age, hypertension, large infarct volume, cerebral microbleeds, and high INR (>4.0). Controlling both ischemic stroke and bleeding risk requires individualized assessment. Early resumption of anticoagulation may reduce recurrent stroke without increasing bleeding events. This case highlights the need for a personalized HT–AF management strategy.

Conclusion: Restarting anticoagulants four to eight weeks after HT-AF may reduce the risk of recurrent stroke and bleeding if it is adjusted to the individual's risk profile.

Keywords: Hemorrhagic transformation, Atrial fibrillation, Anticoagulation, Ischemic stroke, Risk Factor, Bleeding risk

A RARE CASE OF FAHR'S SYNDROME SECONDARY TO HYPOPARATHYROIDISM FOLLOWING TOTAL THYROIDECTOMY IN AN ELDERLY PATIENT

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Background: Fahr's disease (FD) and Fahr's syndrome (FS) are rare neurological disorders characterized by intracranial calcifications observed on brain imaging. These calcifications may involve various brain regions, including the basal ganglia, thalamus, hippocampus, and cerebellum, resulting in a wide range of neurological and neuropsychiatric symptoms depending on their location. FD is considered the primary form associated with genetic mutations, whereas FS is a secondary form caused by underlying conditions such as endocrine or metabolic disorders. One of the most common causes of FS is hypoparathyroidism following thyroidectomy, which leads to calcium-phosphate imbalance and subsequent brain calcification.

Case Description: An 80-year-old female patient presented with recurrent seizures. A non-contrast head CT scan revealed symmetrical bilateral calcifications in the corona radiata, basal ganglia, and cerebellum. The patient had a history of total thyroidectomy performed ten years prior.

Discussion: Fahr's syndrome refers to parenchymal brain calcifications secondary to underlying causes, including endocrinopathies. Total thyroidectomy may result in accidental removal or damage to the parathyroid glands, leading to hypoparathyroidism. The disruption of calcium-phosphate homeostasis in hypoparathyroidism contributes to ectopic soft tissue calcifications, including those in the brain parenchyma.

Conclusion: The pathogenesis of Fahr's syndrome following thyroidectomy involves endocrine dysregulation, specifically hypoparathyroidism. Management of FS in this case requires calcium and vitamin D supplementation to maintain serum calcium-phosphate balance. In addition, targeted treatment should be provided to address the clinical manifestations of FS in the patient.

Keywords: Fahr's syndrome, thyroidectomy, hypoparathyroidism

CHALLENGES IN EARLY DIAGNOSIS OF PROGRESSIVE SUPRANUCLEAR PALSY: SERIAL CASE REPORTS

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Introduction: Progressive Supranuclear Palsy (PSP) is a neurodegenerative disorder marked by movement difficulties, balance issues, and abnormal eye movements. Early diagnosis is often challenging due to its variable presentation and overlap with other neurological disorders.

Case Report: We report two cases of PSP from Ngoerah Hospital. The first involved a 61-year-old man with a two-year history of vision impairment, difficulty performing daily activities, and frequent backward falls. The second case involved a 48-year-old woman whose initial symptom was stiffness. She experienced pain and difficulty with daily activities, as both her hands and feet felt stiff when moved. The patient also complained of neck stiffness. Over the past three years, she had noticed a slowing of movement. In this second case, the symptoms did not improve despite treatment with analgesics, muscle relaxants, and dopamine agonist. In both cases, the diagnosis of PSP was only made three years after the initial onset of symptoms.

Discussion: PSP symptoms vary widely. The most common subtype, PSP-Richardson syndrome, features symptoms like photophobia, blurred vision, balance issues, and unexplained backward falls. Vertical gaze palsy is a hallmark but usually appears later in the disease course. Another subtype, PSP-parkinsonism, occurs in about one-third of cases and includes bradykinesia, rigidity, and asymmetric tremors. While PSP-P may initially respond to levodopa, this effect is often short-lived. Levodopa resistance is considered a diagnostic clue, though responses can vary. MRI is essential for diagnosis, often revealing midbrain atrophy with preserved pons, producing a characteristic "hummingbird" sign on sagittal imaging.

Conclusion: PSP is frequently underdiagnosed, especially in early stages. Key signs such as impaired eye movements, recurrent falls, and limited response to levodopa should raise suspicion. MRI findings are valuable diagnostic tools. Greater awareness of PSP variants can aid in earlier and more accurate diagnosis.

Keywords: Progressive Supranuclear Palsy

BRIDGING THE GAP BETWEEN GUIDELINES AND REALITY: A CASE SERIES ON EARLY MANAGEMENT OF TRAUMATIC SPINAL CORD INJURY IN INDONESIA

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Background: Traumatic spinal cord injury (tSCI) is a medical emergency that requires timely surgical intervention to optimize neurological recovery. The "Time is Spine" principle underlines the urgency of decompression within hours of injury. However, in many low-resource settings like Indonesia, limited access to emergency care and inefficient referral systems pose significant challenges to early management.

Case Description: This case series discusses two patients with tSCI who are managed in urban Indonesia. The first patient, a 48-year-old man with a cervical fracture sustained in a workplace accident, experienced neurological deterioration due to delayed surgery. The second case involved a 27-year-old man who suffered spinal trauma from a fall; his surgery was postponed due to referral inefficiencies. Both patients received corticosteroids during initial management, which aligns with local practices.

Discussion: Case 1 demonstrated internal delays, with surgical planning occurring >24 hours post-injury and no MRI performed while the patient was still stable. Surgery was ultimately canceled due to hemodynamic deterioration, despite the patient meeting surgical criteria. Case 2 highlighted external delays, where the patient reached the definitive care center only 7 days after trauma due to a sluggish referral system, delaying MRI and surgery beyond the optimal window. These delays reflect systemic barriers such as lack of emergency MRI access, delayed decision-making, and uncoordinated referral networks, all of which hinder timely, evidence-based tSCI management.

Conclusion: These cases illustrate the critical need for improved referral pathways, timely access to imaging and surgery, and adherence to evidence-based clinical practice guidelines in managing tSCI. Strengthening these systems is essential to improving the prognosis and quality of care for patients with spinal trauma in Indonesia.

Keywords: spinal cord injury, decompression, steroid, prognosis

ULNAR NERVE NEUROPATHY AT THE WRIST LEVEL POST-TRAUMA FOCUS STUDY ON DIAGNOSE AND PROGNOSTIC: A CASE REPORT

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Introduction: Ulnar nerve neuropathy is the second most common nerve entrapment neuropathy after carpal tunnel syndrome. Potential anatomical entrapment sites include the brachial plexus, cubital tunnel, and Guyon's canal. Detailed examination must be done to figure out the exact location of the nerve injury and to determine the prognosis.

Case Description: A 20 years old Balinese male presented with progressive right hand muscle atrophy over the past six months. The symptoms began following surgical repair of a tendon injury at the right wrist caused by glass trauma in June 2024. Postoperatively, the patient experienced numbness in the lateral side of the right palm and difficulty flexing the right little finger. Nerve conduction study and needle

electrophysiological test then performed. The patient was given oral medication of gabapentine 100 mg twice daily, and oral vitamin B12 twice a day.

Discussion: This patient presented with characteristic signs of ulnar neuropathy at the wrist, including hand muscle atrophy, numbness in the ulnar palm, and impaired flexion of the little finger. Electrophysiological tests confirmed a traumatic neuropathy at the wrist level.

Conclusion: Ulnar nerve neuropathy at the wrist primarily caused by trauma. In this case, the patient was referred for physiotherapy and further orthopedic evaluation for definitive management. The prognostic then can be evaluated by nerve conduction study and needle EMG show ulnar nerve neuropathy (axonotmesis) at the wrist level, proximal to the canal, with signs of active denervation and minimal reinnervation.

Keywords: Neuropathy, Ulnar nerve, UNW

CONCURRENT HEMORRHAGIC AND ISCHEMIC STROKE IN DENGUE FEVER: A RARE CASE REPORT

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Introduction: Neurological complications of dengue fever are increasingly recognized but rarely include concurrent ischemic and haemorrhagic strokes. Their coexistence emphasizes the complex pathophysiology of dengue-associated cerebrovascular injury

Case Presentation: A 51-year-old male presented with a 3-day history of fever and headache with no significant past history. The vital signs were stable with no spontaneous bleeding and normal initial neurological examination. Laboratory findings showed leukopenia (3,600/µL), thrombocytopenia (100,000/µL), and positive dengue NS1 antigen. On the second hospital day, the patient developed acute-onset dysarthria and right-sided hemiparesis. Neurological examination revealed right central facial palsy and decreased motor strength (3/5) in the right upper and lower limbs, with preserved consciousness (GCS 15). Blood pressure remained within normal range. An urgent brain MRI with DWI revealed hyperacute haemorrhage in both cerebellum hemispheres and the left centrum semiovale with subacute infarction in the left thalamic region. No evidence of aneurysm or vascular malformation on MR angiography. Follow-up labs showed worsening thrombocytopenia (7,000/µL), leukocytosis (15,800/µL), haemoconcentration (Hct 42.1%), prolonged aPTT, and markedly elevated D-dimer (16,020 ng/mL). The patient was managed with mannitol, platelet apheresis, FFP, and delayed antiplatelet therapy. Within 15 days, the patient showed progressive neurological recovery and scheduled for neurorehabilitation.

Discussion: A combination of haemorrhagic and ischemic stroke were particularly rare, reflecting the heterogeneity of dengue's neurovascular impact. Ischemic events likely resulted from immune-mediated endothelial injury and transient hypercoagulability during the early febrile phase. In contrast, the hyperacute haemorrhagic stroke caused by severe thrombocytopenia and consumptive coagulopathy suggest DIC-like state during dengue's critical phase. Fragile cerebellum microvasculature and increased capillary permeability due to cytokine-induced endothelial injury facilitated the bleeding.

Conclusion: Simultaneous ischemic and haemorrhagic strokes in dengue fever are rare but highlight the potential biphasic neurovascular injury. Underscoring the importance of early neurological assessment, timely neuroimaging, coagulation monitoring, and individualized neurocritical care.

Keywords: Dengue, Haemorrhagic Stroke, Ischemic Stroke, Coagulopathy, Neuroinfectious Disease, Neurological Complication

ATYPICAL WEBER SYNDROME: THIRD, SEVENTH, AND TWELFTH NERVE PALSIES IN A RARE BRAINSTEM STROKE

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Introduction: Weber syndrome is a rare brainstem stroke syndrome typically caused by infarction of the ventromedial midbrain, leading to ipsilateral oculomotor nerve palsy and contralateral hemiparesis. Atypical variants involving additional cranial nerves challenge classical anatomical models and raise alternative pathophysiologic considerations.

Case Description: A 45-year-old right-handed male presented with sudden-onset right-sided hemiparesis, dysarthria, binocular diplopia, and intermittent swallowing difficulty. Neurological examination revealed left oculomotor nerve palsy, right lower facial weakness consistent with upper motor neuron facial palsy, and right flaccid hemiparesis. A Non-contrast brain CT revealed a hypodense lesion in the left tegmental midbrain, consistent with a lacunar infarct. Blood pressure was critically high (208/141 mmHg) on admission, consistent with a hypertensive emergency. ECG and chest X-ray revealed sinus rhythm and cardiomegaly, respectively. The patient was admitted to a high-care unit for close monitoring and supportive care. Treatment included a combination of acute stroke management, neuroprotective strategies, blood pressure stabilization, and secondary prevention planning.

Discussion: While classical Weber syndrome involves cranial nerve III and the corticospinal tract, the additional involvement of cranial nerves VII and XII suggests other mechanisms, including possible corticobulbar tract disruption, multifocal infarction, vascular variation, or atypical fascicular pathways. This case highlights the complexity of brainstem stroke localization and underscores the need for broader neuroanatomical consideration in atypical presentations.

Conclusion: This report illustrates an atypical variant of Weber syndrome with concurrent CN III, VII, and XII involvement. It supports the possibility of multiple underlying mechanisms beyond traditional models and contributes to expanding the clinical understanding of midbrain stroke syndromes.

Keywords: Atypical Weber Syndrome, Brainstem Stroke, Cranial Nerve Palsy

CORTIKAL BLINDNESS DUE TO BILATERAL STROKE: A CASE REPORT

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Introduction: Cortical blindness is defined as bilateral loss of vision secondary to disruption in the visual pathways posterior to the lateral geniculate nuclei. Bilateral occipital lobe infarctions in the vascular territory of the posterior cerebral arteries are the most common cause of cortical blindness.

Case Report: A 63-year-old man diagnosed with bilateral cerebral ischemia after complaining of suddenlybilateral vision loss for 8 months. His visual acuity is 5/24 in right eye and 5/10 in left eye. He has normally pupillary reflex and normal fundus. A computed tomography scan of the head revealed a bilateral occipital infarction. He has received antiplatelet, antihypertensive, antihyperglichaemia treatment.

Discussion: Bilateral occipital lobe infractions in the vascular territory of the posterior cerebral arteries are mostly secondary to emboli from the heart or the vertebrobasilar circulation. Additionally, prolonged hypotension or hypoxia can lead to watershed infarcts at the parieto-occipital junction between the middle and posterior cerebral arterial territories.

Conclusion: The overall prognosis of bilateral occipital lobe infarcts is poor.

Keywords: Cortical blindness, Bilateral stroke

A CASE OF CEREBRAL SINUS VENOUS THROMBOSIS INDUCED BY PREGNANCY IN BREAST CANCER SURVIVOR

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Introduction: Pregnancy (mostly in third trimester) and puerperium are associated with an increased risk of venous thrombotic event, both in cerebral and other venous territories. Cerebral Sinus Venous Thrombosis

(CSVT) is a rare form of stroke, accounting for 0.5-1% of all strokes. The difficulties in recognition of venous ischemic processes linked to the complexity of the etiology and the polyfactorial which includes malignant hematological neoplasms, infectious diseases, pregnancy and the postpartum period, systemic autoimmune diseases, dehydration, intracranial tumors, oral contraceptives, hypercoagulable state, some drugs, and trauma requiring a high level of clinical suspicion.

Case Desription: A 37-year-old female presented with focal to general seizure for 5 minutes following by unconscious state. After stabilization, she was alert and complained of moderate headache (NPRS 4/10), nausea-vomiting, with right hemiparesis. The patient was pregnant with her first child at 6 weeks of gestation. She had history of controlled invasive breast cancer (No Special Type) stage III with accomplished chemo-radiotherapy. Head computed tomography scan (Figure 1) showed multiple interaxial hypodense lesion with hemorrhagic components accompanied by high D-Dimer (4.04mg/dl). Further magnetic resonance venography revealed dural sinus thrombosis (Figure 2). Within 10 days of hospitalization, the patient underwent pregnancy termination continued by oral anticoagulants and anticonvulsants. During outpatient monitoring for up to 3 years, the patient experienced motoric improvement and controlled seizures.

Discussion: The hypercoagulable stage plays an important role in the occurrence of CSVT, especially in malignancy and pregnancy. CSVT could lead to an increase of intracranial pressure and decrease of CSF absorption resulting intracellular and cytotoxic edema. Early therapeutic interventions with anticoagulant allows for preventing complications and improving outcomes.

Conclusion: CSVT should be considered in special populations with acute neurologic manifestations. Pregnancy planning requires close supervision by a multidisciplinary team to avoid recurrence.

Keywords: breast cancer, pregnancy, sinus vein, stroke, thrombosis

RECURRENT ISCHEMIC STROKE IN A 53-YEAR-OLD MALE PATIENT WITH ANTIPLATELET THERAPY DISCONTINUATION, HYPERTENSION, AND HYPERLIPIDEMIA

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Introduction: Ischemic stroke is a significant global health burden, with worse disability outcomes and higher fatal risks often found following recurrent strokes. Secondary prevention with antiplatelet therapy, alongside with risk factors control, is essential to reduce recurrence possibility, while minimization of bleeding risk should also be brought to attention.

Case Description: A 53-year-old man presented with a sudden onset of weakness on the right side of the body of 21 hours duration. Patient had similar episodes twice in the past 2 years, with history of hypertension and hyperlipidemia (LDL-C: 148mg/dL). Patient also presented with untreated hematochezia for 5 months, from which antiplatelet therapy remained discontinued. Neurological examination showed paresis of the right lower limb and total paralysis of the right upper limb, unilateral facial and hypoglossal nerve supranuclear palsies, and hypoesthesia and paresthesia of the limbs. No mass or ongoing active bleeding was found from digital rectal examination. Non-contrast head CT elucidated subacute infarction in left frontal region and chronic lacunar infarction in right corona radiata. Patient was managed with Aspirin, Clopidogrel, Citicoline, Atorvastatin, Pregabalin, Amitriptyline, Ramipril, Amlodipine, and was referred to a higher hospital.

Discussion: Secondary prevention of non-cardioembolic ischemic stroke highlights risk factors control and administration of antithrombotic medications, which were no longer received by the patient due to hematochezia. In previous visits, patient's blood pressure and LDL-C level had not met the recommended targets (BP: <130/80mmHg, LDL-C: <70mg/dL). Clinical findings showed neurological declines with NIHSS score of 9, while the most recent previous score was 7. As current active bleeding was absent, dual antiplatelet therapy was given, alongside with antihypertensive and antihyperlipidemic agents.

Conclusion: Antiplatelet therapy discontinuation, hypertension, and hyperlipidemia possibly increased recurrence risk in patient. Recurrent ischemic stroke may result in more severe neurological impairments, which will affect patient's function and quality of life.

Keywords: recurrent ischemic stroke, antiplatelet therapy discontinuation, hypertension, hyperlipidemia

STROKE-LIKE EPISODE IN STURGE WEBER SYNDROME: A TRUE ISCHEMIA OR SEIZURE-INDUCED DEFICITS? A CASE REPORT

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Background: Sturge-Weber Syndrome (SWS) is a rare neurocutaneous disorder (1 in 20,000–50,000 live births), characterized by facial port-wine stain, neurological impairments, and sometimes glaucoma. SWS predisposes patients to both cerebral ischemia (from leptomeningeal angiomatosis) and postictal deficits. Distinguishing these etiologies is critical but remains challenging.

Case Presentation: A 15-year-old girl presented with left-sided port-wine birthmark, acute right-sided hemiparesis, dysphasia and dysphagia (modified Rankin Scale [mRS] of 4). Her symptoms were preceded by a week of severe headaches without witnessed seizure. She had a history of speech delay and refractory tonic seizures since infancy, initially occurring monthly. Notably, her last seizure was three years ago controlled by carbamazepine. No significant familial and perinatal histories reported. No ocular abnormalities were found. MRI revealed tram-track calcifications and Diffusion Weighted Imaging (DWI) displayed restricted diffusion in the left parietal lobe, confirming acute ischemia. EEG showed left temporoparietal and bilateral frontal slowing without epileptiform activity. Brain mapping revealed low power in the right temporal and parietal lobes, moderate and strong power on the left temporal and frontal lobe, respectively. While EEG coherence analysis demonstrated interhemispheric asymmetry. She was treated with acetylsalicylic acid, anticonvulsants, nutritional and rehabilitative support, and discharged with improved function (mRS 2), regaining independent ambulation.

Discussion: SWS results from somatic mosaic variants in the *GNAQ* gene, which regulates blood vessel development. Although transient deficits in SWS may be postictal, the lack of seizure activity, persistent weakness, and diffusion restriction on DWI-MRI supported a true ischemic culprit in this case. EEG findings of weak right hemisphere activity and asymmetry may reflect long-standing structural and functional impairment, secondary to the underlying angiomatosis. Unfortunately, genetic testing was not performed.

Conclusion: This case highlights the importance of urgent neuroimaging (DWI-MRI) and EEG in SWS patients with acute deficits to navigate further management.

Keywords: sturge weber syndrome, stroke-like episode, electroencephalography

NONINFECTIOUS SUPERIOR OPHTHALMIC VEIN THROMBOSIS TRIGGERED BY INTERNAL CAROTID ARTERY STENOSIS: AN UNDERRECOGNIZED NEUROVASCULAR COMPLICATION

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Background: Superior ophthalmic vein thrombosis (SOVT) is a rare vascular event, often associated with local orbital pathology. However, in the absence of infection or trauma, clinicians should consider upstream neurovascular causes such as carotid artery disease. This case illustrates

how severe extracranial carotid stenosis can lead to orbital venous outflow obstruction and visual symptoms.

Case: Over the course of 14 days, the vision in the left eye of a 54-year-old man with type 2 diabetes suddenly deteriorated. The examination revealed a visual acuity of 1/60 and an inferior nasal field deficiency. Without any involvement of the cavernous sinus, MRI showed isolated superior ophthalmic vein thrombosis (SOVT). There was no evidence of trauma, infection, cancer, or coagulopathy. Imaging revealed substantial bilateral carotid occlusion and 80% stenosis of the left vertebral artery ostium. Poor drainage was thought to be the cause of orbital venous hypertension. Edoxaban and risk factor management were used in his treatment. Imaging at six months revealed a small improvement in vision and resolution to 2/60.

Discussion: This case illustrates a rare occurrence of severe bilateral carotid artery disease linked to isolated SOVT without cavernous sinus involvement. Common risk factors such coagulopathy, autoimmune illness, cancer, trauma, or infection were absent in this patient. Left internal carotid artery stenosis and left vertebral artery tortuosity were identified as probable causes by imaging. Digital subtraction angiography was used to confirm the diagnosis, highlighting the significance of multimodal imaging in unusual neuro-ophthalmic presentations. A direct oral anticoagulant called edoxaban was effective in treating non-septic SOVT. In order to prevent recurrence, risk factor treatment was essential, especially for diabetes and atherosclerosis.

Conclusion: Internal carotid artery stenosis should be considered a rare but important etiology of SOVT. Prompt recognition and anticoagulant therapy can result in favorable visual outcomes.

Keywords: Superior ophthalmic vein thrombosis, internal carotid artery stenosis, SOVT

A RARE PERIPHERAL CLUE AFTER SEIZURE: LOWER BRACHIAL PLEXUS INJURY WITH AUTONOMIC FEATURES

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Introduction: Lower brachial plexus injuries are rare, and postictal autonomic signs such as Horner syndrome even more exceptional. These complications may be missed when early management focuses on orthopedic trauma. Recognizing such cases enhances clinical vigilance for subtle signs.

Case Description: A 37-year-old woman with untreated focal seizures since 2019 presented after a focal to bilateral tonic-clonic seizure while riding a motorbike. Initial evaluation revealed a right C7 transverse process fracture, but neurological signs were overlooked. She later returned for seizure management. Examination showed right ptosis, medial forearm and hand paresthesia, intrinsic hand weakness, and Horner syndrome. Reflexes were reduced, with C8–T1 weakness (MRC 4/5). EMG confirmed denervation in C8–T1-innervated muscles and absent SNAPs in the ulnar, median, and medial antebrachial cutaneous nerves. MRI revealed T2 hyperintensity and edema at the right C7–T1 roots, middle/lower trunks, and medial cord—suggestive of Sunderland grade II–III traction injury. She was treated with oral prednisolone (1 mg/kg/day, tapered over 12 weeks) and levetiracetam. At 8 weeks, strength improved to MRC 5/5, with pain resolution and partial ptosis recovery. MRI showed reduced edema but persistent T1 root angulation.

Discussion: This case illustrates a rarely recognized postictal complication. Horner syndrome signaled T1 root involvement and was key to diagnosis. The mismatch between C7 fracture (on CT) and clinical/electrophysiologic localization (C8–T1) highlighted the need for EMG and targeted MRI. Traction during seizure-related head–shoulder movement likely caused the lesion. Disruption of sympathetic fibers at T1 explained Horner syndrome, underscoring the vulnerability of autonomic pathways in lower trunk injuries. Neurologists should assess peripheral and autonomic signs after seizures with trauma.

Conclusion: Postictal lower brachial plexopathy with autonomic involvement is rare and often underrecognized. Prompt clinical suspicion and integration of EMG and MRI are essential to avoid misdiagnosis and delay in treatment.

Keywords: Brachial plexopathy, Horner syndrome, Electromyography, Postictal trauma, Focal epilepsy

BINOCULAR DIPLOPIA AS AN EARLY SIGN OF ACUTE MIDBRAIN HEMORRHAGE ON 46-YEAR-OLD MALE PATIENT: A REVIEW OF THE ANATOMY AND LOCALISATION

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Introduction: Acute-onset visual symptoms, such as binocular diplopia, can be an early sign of stroke. While diplopia can result from a range of causes, from benign to life-threatening, its sudden appearance requires careful evaluation. Therefore, an accurate diagnosis and prompt treatment are essential to ensure optimal outcomes and prevent complications.

Case Description: A 46-year-old male patient came with acute binocular diplopia and dizziness since 1 day before administration. He has hypertension and is an active smoker. On the ophthalmology examination, we found skew deviation, upgaze impairment in the left eye, anisocoria, and limitation of downgaze paralysis in the right eye. The finger to nose test and dysdiadochokinesia test were normal. No sensory and proprioception disturbance. Laboratory examination showed an increase in leukocytes 11 x 103 and LDL-C 128. CT Head without contrast confirmed a subacute intracranial hemorrhage (ICH) in the right midbrain. CT Scan Angiography Intracranial showed no intracranial blood vessel malformation.

Discussion: Acute onset of binocular diplopia, dizziness, and headache, with vascular risk factors such as hypertension, direct our diagnosis to the vascular event, a midbrain stroke. Vertical diplopia may result from weakness of the vertical eye movement is mainly coordinated by the rostral interstitial nucleus of the median longitudinal fasciculus, and the interstitial nucleus of Cajal, located in the periaqueductal gray matter of the midbrain, close to the midline. Neuroprotectants, including Citicoline and mecobalamin, along with occlusion therapy, led to improvement in vision and ocular movement during the subsequent three months.

Conclusion: It is essential for clinicians to recognize visual symptoms in stroke patients to understand anatomical localization and ascertain etiologic as guidance for making a diagnostic and therapeutic plan.

Keywords: Stroke, Hemorrhagic stroke, Diplopia, Midbrain Hemorrhage, Occlusion Therapy

IATROGENIC FACIAL NERVE PALSY FOLLOWING TUBERCULOUS LYMPHADENITIS SURGERY

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Introduction: Secondary facial nerve palsy due to trauma or iatrogenic injury has been reported in approximately 11-40% cases. Head and neck surgeries were responsible for up to 25% of iatrogenic facial paralysis. Early diagnosis and prompt treatment are essential, as facial paralysis can lead to significant physical and mental distress.

Case Report: A 36-year-old female presented with vertigo, nausea, and vomiting. She had a recent history of cervical lymph node excision for tuberculous lymphadenitis. During evaluation for peripheral vestibular vertigo, facial asymmetry and left lower lip drooping were noted. She also reported numbness in the lower lip. The symptoms had been present since her surgery a month ago. Head CT scans with and without contrast were unremarkable. Nerve Conduction Velocity and electromyography studies revealed a neurogenic lesion of the left facial nerve distal to chorda tympani, with more pronounced buccal branch involvement, alongside signs of active denervation. These findings were consistent with subacute axonotmesis-type facial nerve neuropathy. Patient was started on methylcobalamin (500 mg twice daily) and scheduled for physiotherapy, with a follow-up EMG in three months.

Discussion: The extratemporal portion of facial nerve divides into five major branches: temporal, zygomatic, buccal, marginal mandibular, and cervical. Iatrogenic facial nerve palsy is a known complication of head and neck surgeries. Electrodiagnostic tests help with diagnosis. In this case, facial nerve palsy was likely due to iatrogenic injury during surgery for tuberculous lymphadenitis. Treatment with vitamin B12 and

physiotherapy was promptly initiated. Although study results on various treatment approaches remain inconclusive, physiotherapy is considered safe and may support recovery. Serial EMG biofeedback can help monitor therapeutic response.

Conclusion: Iatrogenic facial nerve palsy should be considered in patients presenting with facial paralysis following head and neck surgery. Timely diagnosis and intervention can significantly improve patients' quality of life.

Keywords: Facial nerve palsy, Iatrogenic injury, Tuberculous lymphadenitis

FROM SPARKS TO QUADRIPLEGIA: A CASE OF DELAYED CERVICAL SPINAL CORD INJURY FOLLOWING LOW-VOLTAGE ELECTRICAL INJURY

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Introduction: Cervical spinal cord injury from low-voltage electrical trauma is rare, occurring in 2–5% of cases, with 40–75% neurological complications[2,3]. These complications may present early (<24 hours) or be delayed (>5 days), making early detection crucial.

Case Description: A 47-year-old man sustained an electrical burn and 4-meter fall. Initial assessment showed second-degree burns to hands and feet, scalp avulsion with calvarial exposure, and transient loss of consciousness. Seven days post-injury developed neurological complications, including quadriplegia, hypoesthesia and anhidrosis below C4, impaired proprioception, urinary retention, radicular pain, and a modified Japanese Orthopaedic Association (mJOA) score of 1 within 24 hours. MRI revealed longitudinally extensive spinal cord lesions (LESCL) from the cervicocranial junction to C6, C2 anterior, and T6 mild compression fracture, muscle edema, and mild cervical stenosis. After two months, motor improvement was observed, with the presence of clonus, and positive Babinski and Hoffman-Tromner signs, the mJOA score improved to 5. The second MRI revealed reduced LESCL. Somatosensory evoked potentials (SEPs) showed a complete lesion in the dorsal column between C5 and the brainstem.

Discussion: Mechanisms of spinal cord injury from low-voltage electrical injury include thermal or mechanical damage to neurons, blood-brain barrier dysfunction, glutamatergic neuroexcitotoxicity, electroconformational denaturation, oxidative stress, vascular spasm, endothelial inflammation, electroporation causing demyelination. Identifying brain and spinal cord involvement in neurological complications is essential. Delayed spinal cord injury can occur from a few days to a duration of years with permanent or reversible impacts. Neurological complications may be related to demyelination following electrical injury, though the impact of mechanical compression from the fall is still under consideration. MRI and SEPs are valuable to rule out other diagnosis. Neurological recovery can last for months or years.

Conclusion: Electrical injuries demand vigilant monitoring, immediate and long-term, as serious neurological symptoms may emerge weeks later.

Keywords: Electric Injuries, Delayed Onset, Spinal Cord Injuries, Quadriplegia, Neurologic Manifestations

EPIDURAL HEMORRHAGE PRESENTING WITH NON-SPECIFIC NECK PAIN: A CASE REPORT

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Introduction: Epidural hemorrhage (EDH) is a form of intracranial bleeding that often requires prompt surgical intervention, especially when associated with midline shift or signs of increased intracranial pressure. However, not all EDH cases present with classical symptoms. In some instances, clinical manifestations may be subtle, such as isolated headache or neck pain, without altered consciousness or neurological deficits.

Case Report: A 52-year-old man presented to the neurology outpatient clinic with neck pain persisting for three days following a fall down the stairs, during which he sustained a right-sided head injury. The patient remained fully conscious, retained a clear memory of the event, and exhibited no neurological abnormalities. Physical and neurological examinations were unremarkable. A head CT scan revealed a right frontoparietal epidural hematoma measuring approximately 59.1 mL, accompanied by a linear skull fracture, midline shift to the left, and mild ventricular compression. Although surgical evacuation was recommended, the patient declined operative treatment. He was managed conservatively with close observation and was discharged on the tenth day of hospitalization without any neurological deficits.

Discussion: While an EDH volume greater than 30 mL or the presence of a significant midline shift is generally considered a strong indication for surgical intervention, this case demonstrates that conservative management may be a viable option for carefully selected patients with stable neurological status. The favorable outcome in this patient highlights the importance of individualized assessment based on both clinical and radiological findings. Moreover, isolated neck pain following head trauma should prompt thorough evaluation, as it may be the only sign of a significant intracranial lesion.

Conclusion: Although rare, EDH can present with minimal symptoms and no neurological impairment, even in cases involving large hematoma volumes. Conservative treatment may be appropriate in selected patients, provided they are closely monitored and fully informed of the potential risks.

Keywords: Epidural hemorrhage, head trauma, neck pain, midline shift

CERVICAL MYELOPATHY DUE TO DYSTOPIC OS ODONTOIDEUM WITH ATLANTOAXIAL INSTABILITY: A RARE CASE

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Introduction: Os odontoideum is a rare cervical anomaly stemming from a developmental failure in the odontoid process radiologically characterized by an oval or round-shaped ossicle with smooth circumferential cortical margins, signifying a hypoplastic odontoid process that lacks continuity with the vertebral body of the second cervical (C2). Clinical presentation varies, ranging from asymptomatic incidental findings on imaging to neck discomfort or neurological deficits with permanent paralysis in severe cases. Dystopic os odontoideum, where the ossicle is displaced cranially, poses a higher risk of instability and compressive myelopathy.

Case Description: A 40-year-old woman presented with progressive tetraparesis, neck stiffness, cervical paravertebral spasm, and right hypoglossal nerve paresis. Imaging studies including Multislice Computed Tomography (MSCT) and Cervical Magnetic Resonance Imaging (MRI) revealed a dystopic os odontoideum accompanied by a suspected Type II odontoid fracture. The patient was managed with intravenous methylprednisolone and subsequently underwent surgical intervention consisting of atlantoaxial stabilization, C1 laminectomy, and foramen magnum decompression.

Discussion: The clinical presentation in this patient underscores the potential severity of dystopic os odontoideum, particularly when compounded by atlantoaxial instability. In such cases, the risk of spinal cord compression and progressive neurological deficits is significant. Diagnosis requires high-resolution imaging to assess the anatomical abnormalities and associated secondary changes like ligament ossification or joint degeneration. Neurologists play a pivotal role in recognizing these features and guiding timely management, which often necessitates surgical stabilization to prevent permanent neurological damage. This case contributes to the limited literature on dystopic os odontoideum in adults without prior trauma history and highlights the need for vigilance in diagnosing atypical cervical myelopathy.

Conclusion: Os odontoideum, especially in its dystopic variant, should be considered in adult patients presenting with cervical myelopathy, even in the absence of trauma. Early recognition through imaging and prompt surgical consultation are vital to preventing irreversible neurological outcomes.

Keywords: Os odontoideum, cervical myelopathy, atlantoaxial instability, spinal canal stenosis, dystopic odontoid

HEMICHOREA-HEMIHYPOESTESHIA AS THE CLINICAL MANIFESTATIONS OF SUBDURAL HAEMMORRHAGE ASSOCIATED WITH IDIOPATHIC TROMBOCYTOPENIA: A RARE CASE

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Introduction: Idiopathic Thrombocytopenic Purpura (ITP) is hematological disorder characterized by increased platelet destruction or insufficient platelet production. Neurological involvement may occur due to intracranial hemorrhage, which affects approximately 2% cases with mortality rate of up to 55%. One rare form of intracranial hemorrhage is subdural hemorrhage/hematoma (SDH).

Case Description: A 21-year-old woman presented with sudden onset of involuntary movement in her right hand. The complaint recurred twice within 24 hours, each episode lasting about one hour. Symptoms were accompanied by tingling on the right side of the body, intermittent headache, nausea, and vomiting. The patient had history of chronic ITP diagnosed seven months ago. Laboratory showed severe thrombocytopenia (5000/µL), positive ANA test, elevated DsDNA, and random blood glucose of 315 mg/dL. A head CT scan revealed subacute subdural hematoma in the left parietal region. The patient received medical management, including oral antipsychotic (haloperidol 0.5 mg), oral antidepressant (amitriptyline 12.5 mg once daily), and subcutaneous insulin of 10 units for hyperglycemia correction.

Discussion: This case highlights the importance of awareness possibility of spontaneous subdural hemorrhage as complication of chronic ITP, despite its low incidence (around 0.1–1%). Neurological symptoms such as hemichorea and hemihypoesthesia both of which are rare clinical manifestations in SDH were observed. Hemichorea indicates subcortical involvement, particularly in basal ganglia (putamen and thalamus), whereas hemihypoesthesia suggests cortical/subcortical involvement. These symptoms may be associated with reduced average hemispheric cerebral perfusion on both sides of the hematoma, with greater perfusion decline in the putamen and thalamus than in the cortex. Management of spontaneous SDH in ITP patients is complex, especially when surgical intervention is considered. Supportive medical therapy may be the primary option for clinically stable patients.

Conclusion: SDH is a rare complication of chronic ITP and should be aware for. Supportive and medical management are the main options in this condition.

Keywords: thrombocytopenia, subdural, hemichorea, spontaneous, complication

ULNAR NERVE NEUROPATHY AT THE WRIST LEVEL POST-TRAUMA FOCUS STUDY ON DIAGNOSE AND PROGNOSTIC: A CASE REPORT

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Introduction: Ulnar nerve neuropathy is the second most common nerve entrapment neuropathy after carpal tunnel syndrome. Potential anatomical entrapment sites include the brachial plexus, cubital tunnel, and Guyon's canal. Detailed examination must be done to figure out the exact location of the nerve injury and to determine the prognosis.

Case Description: A 20 years old Balinese male presented with progressive right hand muscle atrophy over the past six months. The symptoms began following surgical repair of a tendon injury at the right wrist caused by glass trauma in June 2024. Postoperatively, the patient experienced numbness in the lateral side of the right palm and difficulty flexing the right little finger. Nerve conduction study and needle electrophysiological test then performed. The patient was given oral medication of gabapentine 100 mg twice daily, and oral vitamin B12 twice a day.

Discussion: This patient presented with characteristic signs of ulnar neuropathy at the wrist, including hand muscle atrophy, numbness in the ulnar palm, and impaired flexion of the little finger. Electrophysiological tests confirmed a traumatic neuropathy at the wrist level.

Conclusion: Ulnar nerve neuropathy at the wrist primarily caused by trauma. In this case, the patient was referred for physiotherapy and further orthopedic evaluation for definitive management. The prognostic then can be evaluated by nerve conduction study and needle EMG show ulnar nerve neuropathy (axonotmesis) at the wrist level, proximal to the canal, with signs of active denervation and minimal reinnervation.

Keywords: Neuropathy, Ulnar nerve, UNW

MENINGIOMA IN PREGNANCY: A CASE REPORT

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Background: Meningioma is a benign brain tumor that rarely occurs during pregnancy, with an incidence ranging from 0.1% to 0.5%. However, it may pose significant maternal and fetal risks due to its potential for rapid growth, influenced by elevated levels of estrogen and progesterone. Management during pregnancy presents unique challenges that require an individualized approach based on both maternal and fetal conditions.

Case Presentation: A 35-year-old woman at 16–17 weeks' gestation presented with recurrent seizures and right-sided weakness. MRI revealed a left parietal intracranial mass suggestive of meningioma. Levetiracetam was initiated for seizure control, and the patient was monitored closely. At 34–35 weeks of gestation, cesarean section was performed due to oligohydramnios, resulting in the birth of a healthy infant. Postpartum tumor resection was conducted, and histopathology confirmed a meningothelial meningioma. Following surgery, the patient was in stable condition with complete seizure resolution; however, residual right-sided weakness persisted, requiring further rehabilitation.

Discussion: The clinical course of meningioma during pregnancy may deteriorate due to hormonal and hemodynamic changes. Therapeutic decisions should be based on tumor size, anatomical location, gestational age, and neurological status. In this case, a conservative approach was pursued: the patient remained neurologically stable, MRI demonstrated a left parietal mass measuring 2.2 × 2.7 × 2.8 cm, and there was no radiographic evidence of herniation. Elective surgical intervention is generally deferred until after delivery to minimize perioperative risks to both mother and fetus, unless there is evidence of a life-threatening mass effect or rapid neurological deterioration that necessitates urgent neurosurgical management during pregnancy.

Conclusion: This case of meningioma in pregnancy demonstrates that conservative management with antiepileptics and close monitoring, followed by postpartum tumor resection, can lead to favorable maternal and fetal outcomes. Seizures resolved, but right-sided weakness persisted, emphasizing the importance of individualized, multidisciplinary care and rehabilitation.

Keywords: Meningioma, Pregnancy, Seizure

DOUBLE PRIMARY TUMORS: A RARE CASE OF GLIOBLASTOMA AND BREAST CANCER IN A MIDDLE-AGED FEMALE

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Background: Double primary tumors—two distinct malignancies in a single patient—are rare and pose diagnostic and therapeutic challenges. Glioblastoma (GBM) is the most aggressive primary brain tumor, while breast carcinoma is one of the most common malignancies in women. Their metachronous presentation is extremely uncommon.

Case Description: A 48-year-old female patient presented with progressive left-sided weakness, headaches, and seizures. Neurological examination revealed spastic hemiparesis and mild cognitive impairment. She had been diagnosed with right-sided medullary breast carcinoma (Luminal B subtype: ER/PR-positive, HER2-positive, Ki-67 high) three years earlier, treatment with a mastectomy and eight cycles of chemotherapy with completed response. Head MRI revealed a solid-cystic right frontal lobe mass with midline shift suggestive of glioblastoma, partial resection was performed, histopathologically and immunohistochemistry confirmed as glioblastoma NOS. CA 15-3 level was within normal, USG mammae result was normal no residual mass. The treatment was continue following stupp protocol with chemoradiation and six cycles of adjuvant chemotherapy with temozolomide. Partial response to therapy was achieved based on the Response Assessment in Neuro-Oncology (RANO) criteria after six cycles of chemotherapy.

Discussion: This case highlights a rare metachronous occurrence of glioblastoma following breast cancer. Since the breast cancer had been completed response. Consequently, our focus in this instance is on the treatment of glioblastoma. The management of glioblastoma has been conducted effectively, as shown by a partial response with improvenment in neurologic function.

Conclusion: In metachronous double primary tumors, treatment priority should be given to the active malignancy. Further, we continuously evaluate both the glioblastoma and breast cancer in the patient both of for respon treatment and sign of reccurence. A multidisciplinary approach is essential for the further management and optimizing treatment outcomes.

Keywords: Double primary tumor, glioblastoma, breast cancer, MRI, temozolomide, case report

SPONTANEOUS INTRATUMORAL HEMORRHAGE IN A CLEAR CELL MENINGIOMA MIMICKING STROKE: A RARE CASE REPORT

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Introduction: Clear cell meningioma (CCM) is a rare WHO grade 2 subtype of meningioma with aggressive behavior and high recurrence risk. Although meningiomas are usually benign, spontaneous intratumoral hemorrhage is rare, with an incidence of only 0,5-2,4%, and may present with stroke-like syndrome, making diagnosis challenging.

Case Description. A 40-year-old woman presented with sudden-onset right hemiparesis, headache, and a history of decreased consciousness. She had a prior similar episode one year earlier and a history of uncontrolled hypertension. Neurological examination revealed right central facial and hypoglossal nerve palsies, along with right hemiparesis. Brain MRI showed a left frontoparietal extra-axial mass with cerebrospinal fluid (CSF) cleft sign and dural tail consistent with meningioma, accompanied by perilesional edema and intralesional hemorrhage. The patient underwent craniotomy for hematoma evacuation and tumor resection. Histopathology confirmed clear cell meningioma (WHO grade 2). Postoperative recovery was marked by neurological improvement.

Discussion: Hemorrhage in clear cell meningioma is thought to be associated with fragile neovascularization, tumor necrosis, or vascular invasion. Contributing risk factors include uncontrolled hypertension and tumor localization on the cerebral convexity, both of which may increase the risk of bleeding. Prompt diagnosis using brain imaging, followed by histopathological confirmation, is essential—particularly in patients presenting with a stroke-like syndrome that can obscure the underlying pathology. Surgical resection remains the mainstay of treatment, complemented by supportive measures such as managing intracranial edema and blood pressure control, which are critical for improving clinical outcomes.

Conclusion: Spontaneous intratumoral hemorrhage in clear cell meningioma is a rare entity that can clinically mimic a stroke. Accurate diagnosis through radiological and histopathological examination, as well as early definitive surgical management, is crucial as it provides better outcomes and reduces morbidity and mortality rates in patients.

Keywords: Intratumoral hemorrhage, clear cell meningioma, stroke-like syndrome

DOUBLE PRIMARY BRAIN TUMOR "SCHWANNOMA VESTIBULAR AND MULTIPLE MENINGIOMA": A CASE REPORT

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Background: Double primary brain tumors with different histological types are extremely rare case (about 0.4% of all the primary brain tumors). Standard practices for this case are still inconclusive and the pathophysiology of coexisting tumors has long been debated. Schwannoma vestibular and meningioma found together are closely related to a process of neurofibromatosis.

Case Description: A 35-years-old-female presented with unilateral hearing loss, tinnitus, intermittent headache, gait disturbance, dysphonia and weakness in all four extremities. In neurology examination there were duplex hemiparesis, gait ataxia, sensorineural deafness, VII-IX-X-XII cranial nerves palsy. The head MRI showed inhomogeneous multilobulated mass in right CPA and multiple meningioma on right frontal and parietal lobe, anterior and posterior falk region. The patient was performed with 70% tumor resection. The immunohistochemistry confirmed schwannoma in CPA. After resection, the headache was reduced but other symptoms still exist. MRI evaluation showed residual tumor and multiple dural lesions suggest to meningioma, then the patient performed 27 cycles of radiotherapy. At the follow up the patient died due to untreated shunt infection.

Discussion: Surgery is a procedure that needs to be performed for double primary brain tumor. The first tumor confirmed as vestibular schwannoma based on the anatomy pathology examination and multiple meningioma was diagnosed from the special characteristic of the head CT imaging. Tumor resection was performed for vestibular schwannoma unlike the multiple meningioma was only wait and see monitoring because of the tumor was benign, asymptomatic, small sized, and slowly to grow. Genetic examination was not performed in this patient because of the limitation of facilities in our hospital.

Conclusion: The histopathology examination was mandatory performed to determined the type of tumor. The second tumor was managed with observational monitoring due to asymptomatic symptoms.

Keywords: Double primary brain tumor, multiple meningioma, schwannoma vestibular

GLIOBLASTOMA MULTIFORME IN A YOUNG ADULT PATIENT

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Introduction: Glioblastoma multiforme (GBM) is the most aggressive primary brain tumor in adults, typically affecting patients over the age of 50. GBM in young adults is rare and poses diagnostic and therapeutic challenges. Despite standard multimodal treatment, prognosis remains poor, although younger age, good performance status, and specific molecular markers such as MGMT methylation and IDH1 mutation are associated with better outcomes.

Case Description: A 29-year-old Balinese male presented with progressive left-sided weakness and transient blurred vision in the left eye since 2022. Symptoms were episodic initially, resolving with rest, but gradually worsened. Neurological exam revealed left hemiparesis (grade 4+), and the patient had a Karnofsky Performance Score of 90. MRI of the brain revealed a contrast-enhancing intra-axial mass in the right parieto-occipital lobe, measuring approximately 4.8 x 5.0 x 4.6 cm, with surrounding vasogenic edema, midline shift, and infiltration into the splenium of the corpus callosum—highly suggestive of GBM.

Histopathological examination confirmed glioblastoma multiforme. In the aftermath of surgical resection, the patient is scheduled for radiation and concomitant temozolomide (TMZ) therapy followed by adjuvant TMZ.

Discussion: This case represents a rare presentation of primary GBM in young adult. GBM in younger patients may arise through a different molecular pathway, often involving IDH1 mutations and secondary transformation from low-grade gliomas. Standard treatment includes surgical resection followed by radiotherapy with concomitant TMZ and continue with adjuvant TMZ. Molecular profiling, including MGMT promoter methylation and IDH1 mutation, provides prognostic and predictive value. In this case, the patient's young age and excellent performance status suggest a more favorable prognosis, provided complete treatment adherence.

Conclusion: GBM should remain a differential diagnosis in young adults presenting with progressive neurological deficits. Early imaging, histological confirmation, molecular profiling, and aggressive therapy are critical for optimizing outcomes.

Keywords: Glioblastoma multiforme, young adult, resection, radiotherapy, temozolomide

A JOURNEY OF MALIGNANCY: BRAIN METASTASIS FROM A MALIGNANT CUTANEOUS MELANOMA OF THE FOOT

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Background: Cutaneous melanoma is a highly aggressive malignancy with a strong tendency to metastasize to the brain, representing the third most common source of brain metastases after lung and breast cancer. Brain involvement occurs in approximately 40–60% of patients with advanced melanoma and is often associated with poor prognosis due to limited treatment options and the blood-brain barrier's resistance to systemic therapies.

Case Presentation: A 69-year-old male presented with acute decreased consciousness, left-sided hemiparesis, and prior intermittent headaches. He had a history of malignant melanoma on the left heel, diagnosed and surgically treated in May 2024. However, he declined adjuvant chemotherapy. Physical examination revealed a GCS of E2V2M4, left-sided flaccid hemiparesis, and supranuclear facial nerve palsy. Dermatologic examination showed multiple irregularly pigmented macules and a crusted ulcer on the left heel. CT scan revealed multiple hyperdense lesions in the frontal, temporal, and occipital lobes with vasogenic edema, indicating metastatic brain lesions. The patient was managed with high-dose corticosteroids and supportive therapy.

Discussion: Melanoma brain metastases (MBM) are associated with severe neurological symptoms and poor survival, particularly when systemic therapy is not administered. The pathophysiology involves melanoma cell migration through the bloodstream, breach of the blood-brain barrier, and invasion of brain tissue. Risk factors include male gender, ulcerated primary tumors, and specific anatomical sites. Despite being a rare primary location, the foot lesion in this case underscores melanoma's unpredictable metastatic behavior. Surgical resection and early immunotherapy offer the best outcomes, though many patients present at advanced stages.

Conclusion: This case highlights the severe neurologic consequences and high mortality associated with melanoma brain metastases. Early diagnosis and complete systemic treatment of primary melanoma are critical to preventing central nervous system involvement.

Keywords: Melanoma, Brain Metastases, Prognosis

CHALLENGES IN THE DIAGNOSIS OF MULTIPLE GLIOBLASTOMA: CASE REPORT

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Introduction: Glioblastoma multiforme (GBM) is a malignancy of the central nervous system that is often found, and has an aggressive nature. Lesions in GBM are generally solitary, but GBM with multiple lesions can also occur, but with a rarer incidence. Multiple GBM is often misdiagnosed as a brain metastases tumor due to similar imaging features.

Case Description: This case report present a case of a 48-year-old woman with complaints of headache and imbalance since 2 months before hospital admission. The patient underwent a non contrast brain Computed Tomography Scan (CT Scan) and revealed multiple brain lesions, suggestive of brain metasatases. Contrast with spectroscopy brain Magnetic Resonance Imaging (MRI) was done to confirm the diagnosis. Brain MRI revealed multiple lesions that suggestive of metastases. The patient then underwent tumor resection and biopsy, and the pathological anatomic study revealed that the tumor was GBM. Post operative condition of the patient was good, but after dismissed from hospital, the patient got a severe community acquired pneumonia, then the patient passed away.

Discussion: The diagnostic approach to this patient is quite complicated. In this case, it was initially suspected that the patient had a brain metastases tumor based on the MRI contrast with spectroscopy image. However, after a biopsy was performed on the mass in the right frontal region, and the results of the pathological anatomic examination showed that this mass was GBM. This case shows that the morphological images of GBM and brain metastases are sometimes very similar and often misleading, even though the management for these two diseases is different.

Conclusion: GBM is the most common malignancy in the central nervous system. In cases of multiple brain lesions, multiple GBM can be considered as a possible differential diagnosis in addition to brain metastases.

Keywords: Glioblastoma multiforme (GBM), multiple GBM, metastases

PERIPHERAL FACIAL NERVE PARALYSIS IN A YOUNG ADULT WITH VESTIBULAR SCHWANNOMA: A CASE REPORT

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Introduction: Vestibular schwannoma (VS), or acoustic neuroma, is a benign tumor from Schwann cells of the vestibulocochlear nerve. It usually grows in the internal auditory canal (IAC) or cerebellopontine angle (CPA). Surgery is the main treatment for large tumors. However, peripheral facial nerve paralysis (FNP) is a common complication, even with intraoperative monitoring (IOM).

Case Description: A 30-year-old Balinese woman presented with bilateral visual disturbances, right-sided hearing loss with tinnitus, facial numbness, and balance issues. Brain MRI revealed a 3.6 x 3.6 x 3.7 cm extra-axial infratentorial mass extending from the right IAC to the CPA. Histopathology confirmed a spindle cell neoplasm, suggestive of schwannoma. IOM included free-run EMG, TcMEP, SSEP, BAEP, and EEG, revealing right facial nerve irritation during surgery. After tumor removal via craniotomy, patient developed right peripheral FNP. By day 21 follow up, left visual acuity, right-sided hearing loss with tinnitus, facial numbness, and balance issues improved yet right peripheral FNP and right sided hearing loss with tinnitus persisted.

Discussion: The risk of peripheral FNP following resection of large VS, was inevitable despite the use of IOM. Tumor size and CPA involvement are key factors contributing to facial nerve injury. While IOM aids in detecting nerve irritation, it does not eliminate the risk. Compared to stereotactic radiosurgery, which shows better nerve preservation in smaller tumors, surgical resection of large VS poses greater risk, underscoring the importance of individualized treatment planning.

Conclusion: This patient developed peripheral FNP postoperatively, highlighting IOM's limitations in large tumors and the importance of careful risk-benefit evaluation in complex VS cases.

Keywords: Vestibular schwannoma, intraoperative monitoring, complication, facial nerve paralysis

CHOREOATHETOSIS AS MANIFESTATION OF SECONDARY EXTRAPONTINE MYELINOLYSIS IN INDONESIAN MALE WITH PITUITARY NEUROENDOCRINE TUMOR: A CHALLENGING AND RARE CASE IN NEUROLOGY

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Introduction: Osmotic Demyelination Syndrome (ODS) is a rare neurological condition characterized by myelin sheath damage, often triggered by rapid fluid balance shifts. While typically affecting the pons, ODS may also involve extrapontine regions like the cerebellum, basal ganglia, thalamus, and midbrain leading to symptoms such as parkinsonism, spastic paraparesis, or rarely choreoathetosis. ODS prevalence of about 0.06% but it is a serious issue that can even lead to severe disability or death. This case report describes a 50-year-old Indonesian male who developed choreoathetosis following electrolyte correction.

Case Description: The Patient presented to a neurology clinic at Sardjito Hospital with a 12-month history of recurrent vomiting, polyuria, and cold intolerance. Diagnosed with Cerebral Salt Wasting Syndrome (CSWS), he received intravenous 3% sodium chloride and hydrocortisone 20 mg daily, resolving symptoms. One month later, symptoms recurred with weight loss, dysphagia, dysarthria, confusion, and choreoathetosis in the lower extremity, worsening with anxiety and ceasing during sleep. Brain MRI revealed pituitary macroadenoma and T2 hyperintensity in the caudate nucleus supporting the diagnosis of extrapontine myelinolysis. Treatment with clonazepam 1mg bid, clozapine 12.5mg bid, bromocriptine 1x 2.5mg stabilized symptoms, but choreoathetosis worsened, prompting endoscopic hypophysectomy. Histopathology confirmed a pituitary neuroendocrine tumor. Post-surgery, symptoms persisted for 3 months until a regimen of haloperidol 2x2.5mg, clozapine 1x 12.5mg, and clonazepam 1x 1mg led to improvement. Pituitary hormones are monitored close to normal.

Discussion: Hypopituitarism is often a cause of hyponatremia. Treating hyponatremia needs to evaluate pituitary function to reduce the risk of ODS, especially in patients with suprasellar tumors. Prompt identification and careful management of electrolyte levels are essential to avoid permanent neurological damage. Choreoathetosis could arise from myelinolysis at the basal ganglia circuitry.

Conclusion: Although extrapontine myelinolysis manifesting as choreoathetosis is rare, it should be considered a differential diagnosis in cases presenting with similar clinical features.

Keywords: Choreoathetosis, Extrapontine Myelinolysis, Pituitary Neuroendocrine Tumor

CASE REPORT: USE OF mTOR (MAMALIAN TARGET OF RAPAMYCIN) INHIBITORS FOR SUBEPENDYMAL GIANT CELL ASTROCYTOMA (SEGA) IN TWO PATIENTS WITH TUEBEROUS SCLEROSIS COMPLEX (TSC) AT A TERTIARY NEUROSCIENCE CENTRE

Drs Chee Shin Yong, Sunithi Mani, Ravi Patnaik, Dawn Antony, Norazieda Yassin * JPMC

Introduction: TSC is a multisystem genetic disorder. Mutations in TSC1 or TSC2 genes lead to dysregulated mTOR signaling and tumor formation in multiple organs. Neurological manifestations include seizures, intellectual disability, Sub-Ependymal Nodules (SEN), and SEGA, which may obstruct cerebrospinal fluid flow causing hydrocephalus. Improved imaging has enabled earlier tumor detection, facilitating timely intervention. Everolimus, an mTOR inhibitor, was approved by the FDA in 2012 for SEGA in children over age one and for TSC-associated partial-onset seizures in 2018. It offers the advantage of once-daily oral administration. In 2021, the International TSC Consensus Group recommended integrating mTOR inhibitors as alternatives or adjuncts to surgery in asymptomatic, inoperable, or high-risk SEGA cases.

Case 1: A male patient diagnosed with TSC at age seven presented with seizures and dermatological signs. MRI revealed subependymal tubers with cortical dysplasia. At age seventeen, he developed hydrocephalus from SEGA growth requiring surgical excision. Histopathology confirmed SEGA (WHO Grade 1). Germline testing identified a TSC1 mutation. Everolimus initiated post-operatively resulted in clinical and radiological stability, improved seizure control, and mild mucositis as the only notable side-effect.

Case 2: A male patient diagnosed with TSC at age one presented with Shagreen patches, speech delay, challenging behavior, and seizures. MRI at age two showed cortical tubers and SEN. Seizure control improved with Vigabatrin, but by age eleven, SEN growth raised concerns for SEGA. Germline testing identified a TSC2 mutation. Everolimus started at age fourteen, led to tumor size reduction, improved seizure control and behavior without significant complications.

Discussion: These cases demonstrate Everolimus as an effective, well-tolerated treatment for SEGA in TSC. Monitoring is ongoing to assess long-term outcomes of tumor regrowth and potential side effects.

Conclusion: In rare neurogenetic disorders, early diagnosis, genetic testing, and multidisciplinary care are crucial. Staying updated on emerging therapeutic modalities is essential to meet patients' needs and expectations.

INTRADURAL TUMOR OR SPINAL HEMORRHAGE? A CASE OF CERVICAL EPIDURAL HEMATOMA PRESENTING WITH STROKE-LIKE SYMPTOMS

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Background: Spinal cord compression in elderly patients may mimic acute stroke, especially in those with vascular comorbidities. Distinguishing intradural extramedullary tumors from hemorrhagic spinal lesions remains a diagnostic challenge due to overlapping clinical and imaging features.

Case Description: An 83 year old male with a history of ischemic stroke, coronary artery disease, hypertension, and type two diabetes mellitus, maintained on regular antiplatelet, antihypertensive, and antidiabetic therapy, was referred to the emergency department with a sudden onset of Hemiparese Duplex, more pronounced on the right side, which began three hours prior to presentation. Neurological examination revealed asymmetrical tetraparesis (upper limbs 4/4, lower limbs 1/2), hyperreflexia, and bilateral Babinski signs. Stroke protocol was activated. Brain MRI showed no acute infarction. Cervical MRI revealed a well-demarcated, lobulated, intradural extramedullary lesion at C4–C6 with homogeneous enhancement, hyperintense on T1/T2, and no blooming artifact. Due to ongoing antiplatelet therapy, decompressive surgery was postponed and performed on day seven. Intraoperative findings revealed a well-organized cervical epidural hematoma compressing the spinal cord posteriorly without evidence of tumor tissue. The hematoma was evacuated successfully. Postoperatively, the patient showed notable neurological improvement, with lower limb motor strength increasing from 1/2 to 3/3 within 7 days.

Discussion: This case illustrates the importance of considering spinal pathology in elderly patients with acute neurological deficits and unremarkable cranial imaging. Cervical epidural hematoma may radiologically mimic an intradural extramedullary tumor, leading to diagnostic confusion. Prompt recognition and surgical management can result in favorable outcomes even in advanced age.

Conclusion: Cervical epidural hematoma can present with stroke-like symptoms and mimic neoplastic lesions on imaging. High clinical suspicion and timely intervention are essential for diagnosis and recovery in such complex presentations.

Keywords: cervical epidural hemorrhage, intradural extramedullary tumors, acute neurological deficits, stroke mimic, elderly, diagnostic challenge

PRIMARY INTRADURAL EXTRAMEDULLARY EWING SARCOMA: A CHALLENGING CASE OF SPINAL CORD TUMOR WITH RECURRENCE AND MULTIMODAL TREATMENT

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Introduction: Primary intradural extramedullary Ewing sarcoma (PIEES) is an extremely rare and aggressive malignancy arising within the spinal canal. Its clinical presentation often mimics other more common spinal tumors, leading to potential diagnostic delays. Due to its rarity, standardized treatment protocols remain unclear, and outcomes are typically poor.

Case Description: We report a case of a 43-year-old woman who presented with bilateral lower extremity weakness. Magnetic resonance imaging revealed an intradural extramedullary spinal cord tumor. Surgical resection confirmed the diagnosis of Ewing sarcoma. Despite initial treatment with surgery, radiotherapy, and systemic chemotherapy, the tumor recurred 17 months later. She subsequently underwent repeat surgery, additional radiation, and chemotherapy. The disease progressed with leptomeningeal metastases along the spinal cord, followed by the development of brain metastases. This necessitated whole-brain radiation and intrathecal chemotherapy.

Discussion: This case illustrates the aggressive clinical behavior of PIEES, including its propensity for early recurrence and dissemination throughout the neuraxis. The evolution to leptomeningeal and cerebral metastases despite multimodal therapy underscores the challenges in disease control. Given the rarity of PIEES, each case contributes valuable insight into its natural history and treatment response. A multidisciplinary approach involving neurosurgery, oncology, and radiation therapy is essential to optimize outcomes, although curative treatment remains elusive.

Conclusion: PIEES is a rare and aggressive form of spinal Ewing sarcoma with high potential for recurrence and metastatic spread. Early recognition and a coordinated multidisciplinary treatment strategy are critical, though prognosis remains guarded. Further research is needed to establish effective therapeutic protocols and improve survival in patients with this malignancy.

Keywords: Primary Intradural Extramedullary Ewing Sarcoma, PIEES, Ewing Sarcoma, Leptomeningeal Metastases

A CASE REPORT: CEREBROVASCULAR COMPLICATIONS DUE TO DISSEMINATED STREPTOCOCCUS CONSTELLATUS INFECTION

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Introduction: Cerebrovascular complications such as cerebral infarction, venous thrombosis, intracerebral hemorrhage and subarachnoid hemorrhage have been reported in up to 25% to 31% of bacterial meningitis patients, these are important determinants of poor disease outcome. Case reports on intracranial aneurysm by Streptococcus Constellatus are very limited. [2] We are reporting a case of disseminated streptococcus constellatus infection with complications of cerebral infarction, venous thrombosis and subsequently progressed into mycotic aneurysm.

Case Description: 63-year-old gentleman previously no known medical illness, initially complained of headache, vomiting, fever, and coughing for 3 days, subsequently had sudden onset left sided body weakness. Left upper limb and lower limb power were both MRC grade 4 while the NIHSS was 2. CT brain non- contrast showed infarction at right genu of internal capsule while CTA brain shows significant stenosis involved right petrous ICA ~ 75% with atherosclerosis at bilateral ICA and right M1 MCA segment. He was admitted and treated with aspirin. During admission, he had fever and treated with IV Augmentin. After 6 days, his blood culture growth with Streptococcus Constellatus. Unfortunately, he deteriorated and developed disseminated infection. We started IV benzylpenicillin and complete for total 6 weeks duration. He recovered throughout the admission with residual left sided hemiparesis of MRC grade 4. However, routine repeated CECT brain after completing antibiotic showed incidental finding of bilateral ICA aneurysm which was confirmed by cerebral angiogram later. Internal carotid flow diverter stenting was counselled by intervention radiologist, however patient and family refused and wanted to seek second opinion first.

Conclusion: Cerebral infarction as initial presentation of bacterial meningitis is not uncommon. Although cerebrovascular complications by streptococcus constellatus meningitis are rarely reported, it can be very fatal. Early identification should be done, and patients should be treated aggressively to prevent progression of complications. A follow-up vessels study is important to look for the aneurysm.

UNRAVELING THE MYSTERIES OF DEMYELINATION: A CASE REPORT OF AN ACUTE DISSEMINATED ENCEPHALOMYELITIS IN A MIDDLE-AGED SOMALIAN WOMAN

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Introduction: Acute disseminated encephalomyelitis (ADEM) is an uncommon demyelinating disorder of the central nervous system typically occurring after infections or vaccinations. ADEM is commonly seen in children and young adults, where prognosis is favorable, but few cases are reported in other age groups. The clinical course of these patients compared to younger patients with ADEM is unclear. We report a 23 -year- old Somalian female UNHCR refugee who presented with a constellation of neurological symptoms after receiving her COVID vaccination 3 months prior to her illness.

Case Report: She had blurring of vision in her right eye, weakness of the left arm and right leg pain which led to progressive difficulty in ambulation. She also developed choking episodes, vomiting, dizziness and generalized lethargy. She was noted to have restricted abduction of her left eye, dysarthria, right facial asymmetry and reduced power of MRC grading 4/5 over the right upper limb.

MRI brain and whole spine done revealed multiple lesions of varying sizes with T2W/ FLAIR hyperintensity seen at the supratentorial and infratentorial regions and intramedullary high-signal T2W intensity seen at multiple vertebrae levels which were consistent with demyelinating lesions. EEG done was normal. Lumbar puncture showed no oligoclonal bands. Serum Aquaporin- 4 and serum MOG antibody were negative. She was treated with intravenous immunoglobulin and pulsed steroids and showed remarkable improvement thereafter.

Discussion: It is crucial to detect ADEM early, especially amongst adults in special populations such as our patient because aggressive treatment can be instituted early to prevent serious neurological deterioration.

BATTLING CENTRAL NERVOUS SYSTEM INFECTION IN YOUNG CHILDREN: A CHALLENGING CASE FROM INDONESIA'S REMOTE REGIONS

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Background: Viral encephalitis and bacterial meningitis are two generally overlapping forms of CNS infection. Encephalitis is relatively rare, affecting 3.5–12.3 per 100,000 annually, mainly in children under 15 and adults over 70. Despite its rarity, it causes death in 5.6–39.3% of cases. Bacterial meningitis is more common, with an incidence of 20 per 100,000, primarily in children, and has a fatality rate of up to 50% in untreated cases. In both, death is generally due to irreversible brain damage from herniation.

Case Report: This report follows a 1-year-old female presented with dyspnea, productive cough, and fever for 5 days, followed by impaired consciousness one day prior to admission. She developed generalized tonic-clonic seizure episodes accompanied by signs of increased intracranial pressure (ICP), without signs of meningeal irritation. Metabolic, tuberculosis, and repeated malaria tests were unremarkable. She was diagnosed with acute CNS infection (specifically viral encephalitis) with suspected brain herniation. Neurodiagnostic tests (CSF analysis and neuroimaging) were not performed due to limited access. Her condition worsened despite treatment with third-line antibiotics, antivirals, and ICP-lowering agents, and she ultimately succumbed to the illness.

Discussion: Diagnosis of CNS infection is based on appropriate clinical signs, supported by neuroimaging tests, and confirmed by CSF analysis. Neuroimaging helps to narrow down the differential diagnosis and to look for complications, prognostication, follow-up, and differential diagnosis. Our patient showed deterioration despite empirical treatments, thus highlighting the need for CSF analysis and neuroimaging tests to confirm the etiology of CNS infection and to detect complications.

Conclusion: CNS infections are generally difficult to diagnose and treat in pediatric cases due to overlapping and lack of specific clinical signs, e.g. meningeal signs. This report emphasizes the need for neurodiagnostic tools to accurately diagnose and detect complications in pediatric CNS infection even in areas of limited resources in Indonesia.

Keywords: neuropaediatric, CNS infection, encephalitis, meningitis, remote are

A RARE NEUROLOGICAL COMPLICATION OF DENGUE HEMORRHAGIC FEVER: PEDIATRIC ACUTE DISSEMINATED ENCEPHALOMYELITIS IN A RURAL SETTING

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Introduction: Acute Disseminated Encephalomyelitis (ADEM) is a rare, immune-mediated demyelinating disorder of the central nervous system (CNS), often triggered by viral infections. Its occurrence following dengue virus infection is uncommon and not fully understood.

Case Report: A 15-year-old boy presented with drowsiness following three days of high fever. He experienced a nonspecific headache and epigastric pain, without nausea or vomiting. On examination, GCS was E4M5V4; pupils were equal and reactive; no petechiae or limb weakness were noted. During hospitalization, he developed severe nasal, gingival, and gastrointestinal bleeding. His condition deteriorated into delirium five days after hospitalization. Lab results showed Hb 15.3 g/dL, Ht 44%, leukocytes 10,800/uL, and platelets 20,000/uL. Liver enzymes were elevated (AST 285 u/L, ALT 203 u/L). Dengue IgG was positive. He was diagnosed with ADEM secondary to severe dengue hemorrhagic fever (DHF). CT scan showed no hemorrhage or mass. EEG revealed diffuse cerebral slowing, consistent with encephalopathy. Due to limited resources, MRI and CSF analysis were not performed.

Discussion: ADEM typically presents in children with acute encephalopathy and multifocal neurological signs, usually post-infection. Although neurological complications of dengue include encephalitis and Guillain-Barré syndrome, ADEM remains rare. The delayed onset of neurological symptoms after DHF supports an immune-mediated mechanism. Despite limited diagnostics, the clinical picture and EEG supported ADEM. The patient was treated with high-dose methylprednisolone pulse therapy (0.5 g/day for 6 days). Consciousness returned on day five of therapy, and he was discharged after two weeks. One-week follow-up showed full neurological recovery.

Conclusion: This case highlights the importance of recognizing post-dengue ADEM, particularly in children from endemic, resource-limited settings. Early suspicion and prompt methylprednisolone therapy can lead to favorable outcomes and prevent long-term neurological complications.

BRAIN ABSCESS IN PREGNANCY: A CASE REPORT

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Background: A brain abscess represents a localized infection within the central nervous system (CNS), typically involving an area of cerebritis and central necrosis encased by a vascular capsule.(1) Although rare during pregnancy, the disease can manifest with vague symptoms and carry significant risks to maternal and fetal health. Infections that spread directly from adjacent sites such as teeth, sinuses, ears, or mastoid processes account for the majority of cases.(2) Here, we describe a pregnant patient presenting with persistent headache and a background of chronic otitis media.

Case Decsription: A 27-year-old woman at 32 weeks gestation presented to the Emergency Department with decreased consciousness for 3 days, preceded by gradual confusion over the past 5 days. She had a 3-month history of diffuse headache and a 2-month history of left ear infection. Neurological exam showed GCS E2V2M5, right-sided motor deficits, and a positive Babinski on the right leg. Vital signs were within normal limits. Laboratory tests showed leukocytosis (12,800/uL). A non-contrast head CT showed a left cerebral abscess, suspected early cerebritis, chronic left otomastoiditis with mastoid air cell destruction. Patients consult to ENT, Obgyn, Anasthesia and Neurosurgery Division. After surgery, the patient's consciousness and neurological function slowly improved.

Case Discussion: Clinical manifestations of cerebral abscess vary depending on the infection's origin, location, size, number of lesions, and affected brain structures. Although rare during pregnancy, it presents with nonspecific symptoms and poses a serious threat to both mother and fetus, with a high mortality rate. Management usually involves a combination of surgical and medical therapy to eliminate the infection.

Conclusion: Brain abscesses occurring during pregnancy present substantial risks to maternal and fetal health, necessitating advanced therapeutic interventions and coordinated multidisciplinary care to optimize outcomes for both the mother and the developing fetus.

Keywords: Brain Abscess, Otitis, Pregnancy

STEPWISE DIAGNOSIS: UNCOVERING PROBABLE TUBERCULOUS MENINGITIS IN THE EMERGENCY SETTING

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Introduction: Tuberculous meningitis (TBM), a life-threatening *Mycobacterium tuberculosis* infection of the meninges, challenges emergency doctors due to subacute neurological presentations mimicking stroke or other conditions. With 20–50% mortality if untreated, timely diagnosis is critical in TB-endemic areas. Structured anamnesis and thorough physical examination prompt targeted diagnostics such as cerebrospinal fluid (CSF) analysis and contrast head CT, which enable rapid probable TBM identification. Timely recognition in the emergency department (ED) prevents fatal delays and guide empiric therapy.

Case Description: A 45-year-old male with type 2 Diabetes Mellitus (DMT2) presented to ED with loss of consciousness 2 hours before admission. He has 4-month history of repeated hospitalization for weakness and recurrent headache, initially suspected as stroke (non-contrast head CT showed no infarct). Further anamnesis revealed TB constitutional symptoms. Physical examination came with decreased consciousness GCS 13/15 (E3M6V4), positive meningeal signs, right-sided hemiparesis and hypoesthesia, and right cranial nerve VII paresis. CSF analysis concluded TBM. Contrast head CT revealed left frontoparietal meningeal enhancement, suggesting probable TBM. Empiric anti-TB therapy and corticosteroids showed clinical improvement, and patient was discharged after 1 week.

Discussion: The Marais Diagnostic Score (12/20) confirmed probable TBM, driven by clinical (4-month duration, systemic symptoms, focal

deficits, cranial nerve palsy, altered consciousness), CSF (clear appearance, lymphocytic pleocytosis, elevated protein), and imaging (meningeal enhancement) findings. Atypically high CSF glucose may reflect DMT2-related hyperglycemia or early TBM's minimal glucose consumption. This stepwise approach of history, examination and targeted diagnostics (i.e. CSF analysis and contrast head CT) enables distinguishment of TBM from other neurological conditions which ensures timely therapy.

Conclusion: This case highlights the critical role of stepwise diagnosis; use of structured anamnesis and thorough physical examination to prompt targeted lab and imaging for emergency doctors to diagnose probable TBM. Timely recognition in the ED prevents fatal delays and guide empiric therapy.

Keywords: Tuberculous meningitis (TBM), stepwise diagnosis, emergency department (ED), Marais diagnostic score

THE SILENT KILLER: RHINO-ORBITO-CEREBRAL MUCORMYCOSIS LEADING TO FATAL ACUTE ISCHEMIC STROKE

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Introduction: Mucormycosis is a rare but serious fungal infection characterized by poor prognosis and high mortality. This case highlights both the rapid disease progression and diagnostic challenges posed by atypical infections in immunocompromised patients, which hinder early detection and treatment.

Case Report: A 53-year old woman presented with blurry vision in her left eye, difficulty with nasal breathing, numbness-tingling sensations on both soles of her feet, along with history of poorly controlled diabetes mellitus, chronic alcohol consumption, and smoking. Physical examination revealed no light perception (NLP) and ophthalmoplegia in the left eye. Laboratory findings were indicative of diabetic ketoacidosis. Initial head MRI and MRA revealed left paranasal sinusitis, chronic small vessel ischemia on right parietal-temporal lobe, with no acute infarct or intracranial hemorrhage. She was started on aspirin and DKA protocol. Additional diagnosis of rhino-orbito-cerebral mucormycosis (ROCM) was made following nasal debridement. The patient later demonstrated altered consciousness and right-sided hemiparesis, with hyperacute infarct distributed on the left middle cerebral artery territory (ASPECT Score 0) revealed on MRI. Despite the initiation of antifungal and ischemic stroke intervention, her condition continued to decline, resulting in death.

Discussion: ROCM typically results from contiguous spread from paranasal sinuses or traumatic orbital inoculation. Angioinvasion, a hallmark of mucormycosis, contributes to vascular thrombosis, profound tissue necrosis, and widespread systemic disease. Unique spore coating proteins (CotH) facilitate host cell invasion and angioinvasion by binding to GRP78 and integrin $\alpha 3\beta 1$ receptors, interactions amplified under hyperglycemic and ketoacidotic states. Mucorales thrive through high-affinity iron uptake and siderophore production, with elevated serum iron promoting Rhizopus oryzae growth under acidic conditions. Additionally, Rhizopus oryzae synthesizes ketoreductase, enabling ketone body metabolism, which enhances its pathogenic potential.

Conclusion: Early detection, familiarity with its clinical manifestations, and prompt intervention are critical for optimizing survival and outcomes in mucormycosis.

Keywords: mucormycosis, ischemic stroke

TUBERCULOUS (TB) SPONDYLITIS MIMICKING RELAPSING ACUTE TRANSVERSE MYELITIS (ATM): A CASE REPORT

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Background: Acute Transverse Myelitis (ATM) is an inflammatory condition that acutely and focally attacks the spinal cord, causing rapidly progressive neurological deficits including motor, sensory, and autonomic dysfunctions as well as back pain. In relapsing cases, patients experience more than one episode of inflammation with remission periods in between. Meanwhile, Tuberculous Spondylitis (TB spondylitis) presents with prolonged back pain, fever, night sweats, and weight loss. Advanced TB spondylitis can cause neurological deficits due to spinal cord or nerve compression.

Case Report: A 26-year-old male with acute progressive weakness in both lower limbs 2-weeks before admission, without fever, night sweats, or weight loss. He had a history of similar complaints that previously resolved completely without medication. Physical examination revealed spastic paraparetic type weakness and hypoesthesia from the toes up to the umbilicus without autonomic involvement. Cerebrospinal fluid (CSF) showed elevated protein (236 mg/dL) without elevated leukocyte (2.0 cells/μL) and LDH (26 U/L). Contrast-enhanced whole spine MRI revealed a lesion at T8-T9 and a compression fracture at T9. Biopsy showed nonspecific chronic inflammation with necrotic foci. Initial treatment with intravenous methylprednisolone 1 gram daily for 5-days resulted in significant improvement.

Discussion: The patient exhibited an acute onset of progressive worsening bilateral lower limb weakness with a previous history of similar symptoms that resolved completely without treatment. Only motor and sensory deficits were observed, without autonomic involvement. CSF showed elevated protein without elevated leukocyte and LDH, suggesting inflammation. The effectiveness of early steroid therapy also supported the diagnosis of ATM. However, MRI and biopsy findings did not show typical signs of transverse myelitis but rather indicated TB spondylitis.

Conclusion: Relapsing ATM and TB spondylitis are two serious conditions that can cause significant neurological impairment. Early and accurate diagnosis is critical to guide appropriate treatment, prevent permanent damage, and improve patient outcomes.

Keywords: Tuberculous (TB) Spondylitis, Acute Transverse Myelitis (ATM), Relapsing Myelitis

CLINICAL IMPROVEMENT OF TRANSVERSE MYELITIS WITH THE MANAGEMENT OF PLASMAPHARESIS THERAPY

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Introduction: Transverse myelitis (TM) is a rare acute or subacute inflammatory condition of the spinal cord that can lead to significant neurological deficits, such as motor weakness, sensory disturbances, back pain, and autonomic dysfunction. The etiology of TM varies, including infectious and post-infectious immune-mediated reactions, which can affect the patient's prognosis.

Case Description: A 48-year-old woman presented with progressive weakness in both lower limbs, lower back pain, paresthesia, and urinary retention. Whole-spine MRI revealed a longitudinal intramedullary lesion extending from C5 to T9, consistent with transverse myelitis. Serological tests showed IgG reactivity for CMV, Toxoplasma, and Rubella, suggesting prior infections. Initial treatment with high-dose intravenous methylprednisolone was discontinued due to an allergic reaction. This regimen led to significant clinical improvement, with the motor strength of both lower extremities improving from 0/2 to 4/4.

Discussion: TM is an inflammatory manifestation that can be triggered by reactivation of latent infections such as CMV, Toxoplasma, and Rubella. High-dose corticosteroids are the first-line treatment in the acute phase, while plasmapheresis is considered as second-line therapy in patients who do not respond. Studies have shown that a combination of high-dose corticosteroids and plasmapheresis results in better recovery compared to monotherapy.

Conclusion: In this patient, high-dose corticosteroid therapy was administered using intravenous methylprednisolone at a total dose of 2500 mg, followed by methylprednisolone 500 mg/hour via syringe pump over 23 hours. However, due to an allergic reaction, plasmapheresis was performed in four cycles. After this treatment, the patient showed clinical improvement.

Keywords: Transverse myelitis, plasmapheresis

STEPWISE DIAGNOSIS: UNCOVERING PROBABLE TUBERCULOUS MENINGITIS IN THE EMERGENCY SETTING

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Introduction: Tuberculous meningitis (TBM), a life-threatening *Mycobacterium tuberculosis* infection of the meninges, challenges emergency doctors due to subacute neurological presentations mimicking stroke or other conditions. With 20–50% mortality if untreated, timely diagnosis is critical in TB-endemic areas. Structured anamnesis and thorough physical examination prompt targeted diagnostics such as cerebrospinal fluid (CSF) analysis and contrast head CT, which enable rapid probable TBM identification. Timely recognition in the emergency department (ED) prevents fatal delays and guide empiric therapy.

Case Description: A 45-year-old male with type 2 Diabetes Mellitus (DMT2) presented to ED with loss of consciousness 2 hours before admission. He has 4-month history of repeated hospitalization for weakness and recurrent headache, initially suspected as stroke (non-contrast head CT showed no infarct). Further anamnesis revealed TB constitutional symptoms. Physical examination came with decreased consciousness GCS 13/15 (E3M6V4), positive meningeal signs, right-sided hemiparesis and hypoesthesia, and right cranial nerve VII paresis. CSF analysis concluded TBM. Contrast head CT revealed left frontoparietal meningeal enhancement, suggesting probable TBM. Empiric anti-TB therapy and corticosteroids showed clinical improvement, and patient was discharged after 1 week.

Discussion: The Marais Diagnostic Score (12/20) confirmed probable TBM, driven by clinical (4-month duration, systemic symptoms, focal deficits, cranial nerve palsy, altered consciousness), CSF (clear appearance, lymphocytic pleocytosis, elevated protein), and imaging (meningeal enhancement) findings. Atypically high CSF glucose may reflect DMT2-related hyperglycemia or early TBM's minimal glucose consumption. This stepwise approach of history, examination and targeted diagnostics (i.e. CSF analysis and contrast head CT) enables distinguishment of TBM from other neurological conditions which ensures timely therapy.

Conclusion: This case highlights the critical role of stepwise diagnosis; use of structured anamnesis and thorough physical examination to prompt targeted lab and imaging for emergency doctors to diagnose probable TBM. Timely recognition in the ED prevents fatal delays and guide empiric therapy.

Keywords: Tuberculous meningitis (TBM), stepwise diagnosis, emergency department (ED), Marais diagnostic score

MASSIVE SPONTANEOUS PNEUMOCEPHALUS AS A SENTINEL RADIOLOGICAL SIGN OF SINUSITIS-RELATED BRAIN ABSCESS

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Introduction: Spontaneous pneumocephalus, defined as the presence of intracranial air without prior trauma or neurosurgical intervention, is a rare clinical finding. Its occurrence secondary to sinusitis is exceptionally uncommon. Air may enter the intracranial compartment through skull base erosion or fistula, typically resulting from contiguous infection, and may serve as an early indicator of severe complications such as brain abscess. This case report highlights a rare presentation of massive spontaneous pneumocephalus serving as a sentinel radiological sign of sinus-origin brain abscess in an immunocompetent adolescent.

Case Description: A 17-year-old male presented with a two-month history of progressive headaches, nausea, vomiting, fever, and a recent episode of transient loss of consciousness. Neurological examination was unremarkable. Brain CT revealed bilateral frontal cystic lesions with intraventricular pneumocephalus, subfalcine herniation, and multi-sinusitis. Angiographic evaluation excluded vascular abnormalities, though mild compression of the anterior cerebral artery was noted, likely due to the frontal lobe mass effect. The patient was treated with antibiotics and corticosteroids, followed by craniectomy with microsurgical aspiration, which cultured *Staphylococcus haemolyticus*. The patient demonstrated significant clinical improvement postoperatively. Follow-up imaging showed reduced abscess and pneumocephalus.

Discussion: In this case, the massive pneumocephalus was not incidental but reflected an active component of the abscess pathophysiology. The air-fluid level and intracavitary air within the abscess strongly suggested occult skull base erosion or a functional fistula between the infected sinuses and intracranial space. Although *Staphylococcus haemolyticus* is not a gas-producing organism, intracranial air indicated a structural breach rather than microbial gas production. Thus, pneumocephalus was a sentinel radiological sign of a severe intracranial infection requiring urgent multidisciplinary intervention.

Conclusion: Massive spontaneous pneumocephalus may represent a sentinel radiological sign of skull base breach and sinusitis-related brain abscess, highlighting the importance of early recognition and multidisciplinary intervention to prevent life-threatening complications.

Keywords: Spontaneous pneumocephalus, cerebral abscess, sinusitis

CAVERNOUS SINUS THROMBOSIS WITH ISOLATED ABDUCENS NERVE PALSY: A CASE REPORT

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Introduction: Cavernous sinus thrombosis (CST) is a rare but potentially lifethreatening condition characterized by a blood clot within the cavernous sinus, located at the base of the skull. This condition can lead to neurological deficits due to the compression of cranial nerves, particularly the abducens nerve (CN VI), which controls eye movement. CST often presents with symptoms like headache, diplopia, and ocular pain, and may result from infections, hypercoagulable states, or trauma. Early diagnosis through imaging is crucial for effective treatment.

Case presentation: A 52-year-old male presented with a year-long history of throbbing left-sided headache, which radiated to the neck, and diplopia for the past three weeks. Neurological examination revealed isolated left-sided abducens nerve palsy. Laboratory results were normal, and chest X-ray showed no abnormalities. Digital subtraction angiography (DSA) revealed a decrease in venous flow, confirming the presence of cavernous sinus thrombosis. The patient had no history of trauma or infection, making the cause of the thrombosis unclear.

Clinical Discussion: CST is uncommon, with an incidence of 1-4% of venous thrombosis cases. Symptoms often include headache, ocular pain, and diplopia, as seen in this case. The abducens nerve is most commonly affected, causing restricted eye movement. The condition can be triggered by infections, hypercoagulable states, or other underlying conditions. Imaging techniques such as MRI and DSA are critical for diagnosing CST and assessing the extent of thrombosis. Treatment primarily involves anticoagulation therapy to prevent complications such as meningitis or brain abscesses.

Conclusion: Cavernous sinus thrombosis should be considered in patients with headache and diplopia, particularly when cranial nerve palsies are present. Timely diagnosis with imaging and appropriate anticoagulation therapy are essential to improving outcomes and preventing complications.

Keywords: cavernous sinus thrombosis, abducens nerve palsy, headache, cranial nerve deficits, diagnosis, treatment

A CASE OF ANTI-NMDAR ENCEPHALITIS IN A YOUNG MAN: WHEN PSYCHOSIS MASKS A NEUROLOGIC CRISIS

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Introduction: Anti-NMDAR encephalitis represents a rare autoimmune disorder mediated by antibodies against NMDA receptors, causing synaptic dysfunction. While predominantly affecting young women with ovarian teratomas, cases in males and non-paraneoplastic variants are increasingly recognized. The condition typically presents with a complex neuropsychiatric syndrome including behavioral changes, psychosis, movement disorders, and autonomic instability, often leading to delayed diagnosis.

Case Report: A previously healthy 20-year-old male developed subacute-onset auditory hallucinations, paranoia, and emotional lability. Initial treatment with antipsychotics provided minimal benefit as symptoms progressed to mutism, catatonic rigidity, and focal seizures. Autonomic instability manifested as tachycardia, hyperhidrosis, and fever. Neuroimaging Brain MRI revealed normal. No abnormalities were detected in T1, T2, and contrast-enhanced images, while EEG demonstrated characteristic extreme delta brush pattern. CSF analysis confirmed anti-NMDAR antibodies establishing the definitive diagnosis. The patient received combined immunotherapy with high-dose methylprednisolone and therapeutic plasma exchange, along with anticonvulsant therapy (valproic acid and levetiracetam). This regimen resulted in gradual clinical improvement, with near-complete resolution of neurological and psychiatric symptoms over six months of follow-up.

Discussion: This case underscores the importance of considering anti-NMDAR encephalitis in young patients presenting with acute neuropsychiatric symptoms, regardless of gender or tumor association. The characteristic clinical progression from psychiatric features to neurological deficits, coupled with specific EEG findings, should prompt early CSF antibody testing. Aggressive immunomodulation with corticosteroids and plasma exchange, initiated promptly, can lead to excellent functional recovery, emphasizing the need for multidisciplinary management of this potentially reversible condition.

Conclusion: Anti-NMDAR encephalitis can occur in young men without tumors and should be considered in subacute onset of neuropsychiatric symptomps. Early diagnosis and appropriate therapeutic intervention, including aggressive immunotherapy and symptomatic management can result in good recovery.

Keywords: Autoimmune, Antibody, Encephalitis, NMDAR Encephalitis, Ovarian Teratoma, Therapeutic Plasmapharesis

A RARE THERAPEUTIC DILEMMA: THROMBOLYSIS IN ISCHEMIC STROKE WITH CONCURRENT INTRACRANIAL EPIDURAL ABSCESS

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Introduction: Stroke is a sudden-onset neurological deficit caused by interruption of cerebral blood flow. Intravenous thrombolysis with recombinant tissue plasminogen activator (r-tPA) is the gold standard treatment for acute ischemic stroke. However, its use is limited to a small proportion of patients (2–8.5%) due to contraindications or late presentation. Intracranial epidural abscess (ICEA) is a rare but potentially life-threatening infection that can result in severe neurological complications.

Case Description: We report a case of a 50-year-old Asian male who presented with acute aphasia and right-sided weakness, which began 2 hours prior to admission. He also exhibited slurred speech and irrelevant response pattern. His history included burr hole surgery and osteoplasty 20 years earlier for a post-traumatic hematoma, and he had experienced persistent purulent discharge from the left side of his head for the past 5 years. On examination, his Glasgow Coma Scale (GCS) was 4X6 (sensory aphasia), and his NIH Stroke Scale (NIHSS) score was 10. Imaging showed no evidence of hemorrhage but revealed a surgical defect, pneumocephalus, encephalomalacia, and soft tissue swelling. Intravenous thrombolysis was administered 3 hours and 5 minutes after symptom onset. Within 24 hours, his NIHSS score improved markedly from 10 to 1.

Discussion: Thrombolysis can be beneficial in acute ischemic stroke even in complex cases with comorbidities such as ICEA. Careful evaluation, timely intervention, and close monitoring are essential to ensure safety and optimize outcomes.

Conclusion: This case highlights that intravenous thrombolysis may be safely and effectively performed in acute ischemic stroke, even when complicated by a coexisting intracranial epidural abscess, with proper clinical judgment.

Keywords: Intracranial epidural abscess, intravenous thrombolysis, r-TPA, stroke

A RARE INTERSECTION: COEXISTENCE OF ANTI-NMDA RECEPTOR AUTOIMMUNE ENCEPHALITIS AND CEREBRAL SINUS VENOUS THROMBOSIS IN A YOUNG ADULT – A CASE REPORT

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Introduction: Cerebral Sinus Venous Thrombosis (CSVT) accounts for approximately 0.5% to 3% of all stroke cases. Its clinical presentation can mimic a wide range of neurological disorder, including encephalitis. The simultaneous occurrence of Anti-NMDA Receptor (NMDAR) autoimmune encephalitis and CSVT is exceedingly rare, and poses significant diagnostic and therapeutic challenges.

Case Report: We present a case of a 19-year-old female who was admitted with fever, throbbing headache, altered mental status, and seizures. Neurological examination revealed no focal deficits. A computed tomography (CT) scan revealed thrombus formation in the transverse and sigmoid sinuses. Digital subtraction angiography (DSA) in the venous phase confirmed the absence of venous flow in the left transverse and sigmoid sinuses, consistent with CSVT. Cerebrospinal fluid (CSF) analysis revealed pleiocytosis, suggested a viral infection. The patient was empirically treated for both viral encephalitis and CVST. Due to the lack of improvement with initial treatment, further diagnostic evaluation was performed, revealing the presence of anti-NMDA receptor antibodies in the serum. The patient was treated with immunotherapy, including high-dose corticosteroids and intravenous immunoglobulin (IVIG), alongside continued anticoagulation.

Discussion: The coexistence of anti-NMDAR encephalitis and CSVT is rarely documented in the literature. The occurrence of CSVT in the context of autoimmune encephalitis may result from inflammation-induced hypercoagulability. The overlapping clinical features of CSVT and anti-NMDA receptor encephalitis can obscure diagnosis, delaying appropriate treatment. Prompt recognition and combined management with immunotherapy and anticoagulation are essential for optimal outcome.

Conclusion: This case highlights the importance of considering autoimmune encephalitis in young patient with atypical or refractory encephalitic presentations. The rare coexistence of anti-NMDAR encephalitis and CSVT, underscores the need for comprehensive evaluation to preventing long-term neurological complications and improving prognosis.

Keywords: CSVT, Anti-NMDAR Encephalitis, Autoimmune, DSA

LONGITUDINALLY EXTENSIVE TRANSVERSE MYELITIS IN A YOUNG WOMAN: A DIAGNOSTIC CHALLENGE WITH SUSPECTED PARANEOPLASTIC ETIOLOGY

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Background: Longitudinally extensive transverse myelitis (LETM) is an uncommon inflammatory disorder of the spinal cord involving three or more vertebral segments. While autoimmune and infectious causes are frequently identified, paraneoplastic or neoplastic etiologies must also be considered, particularly in the presence of systemic abnormalities.

Objective: To report a diagnostically challenging case of LETM in a young adult female with clinical and laboratory findings suggestive of a paraneoplastic process.

Case Description: A 38-year-old woman presented with progressive numbness and weakness extending from the left thoracic region to both lower extremities, progressing to flaccid paraplegia and sphincter dysfunction. Magnetic resonance imaging of the spine demonstrated a longitudinal T2 hyperintense lesion spanning T1 to T9. High-dose intravenous methylprednisolone was administered.

Two months later, the patient exhibited neurological deterioration. Examination revealed persistent flaccid paraplegia, a T1 sensory level, hyperreflexia, and autonomic disturbances. Further investigations revealed lupus erythematosus cells, borderline anti-Smith antibodies, hypercalcemia, and multiple osteolytic lesions on skeletal survey. Computed tomography excluded visceral malignancies.

Bone marrow aspiration showed hypercellular marrow with marked granulopoietic activity and an elevated myeloid-to-erythroid ratio, consistent with chronic myeloid leukemia. The patient was initiated on immunosuppressive therapy and showed partial neurological recovery during follow-up.

Conclusion: This case highlights the importance of considering paraneoplastic syndrome associated with hematologic malignancies, particularly chronic myeloid leukemia, in patients presenting with longitudinally extensive transverse myelitis and systemic features such as hypercalcemia and osteolytic lesions. Comprehensive evaluation is essential for accurate diagnosis and optimal treatment.

Keywords: Longitudinally Extensive Transverse Myelitis; Paraneoplastic Syndrome; Chronic Myeloid Leukemia; Osteolytic Lesions; Myelopathy

A NEAR-MISS CASE REPORT: SEVERE TUBERCULOUS MENINGITIS FOLLOWING DELAYED DIAGNOSIS DESPITE EARLY MEDICAL CONTACT

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Background: Meningitis is the most severe form of tuberculosis (TB), associated with mortality and long-term disability rates up to 60%. Delayed diagnosis is a major contributor to poor outcomes, as clinical signs are often non-specific and access to definitive diagnostic tools may be limited. Many patients are diagnosed at advanced stages, when complications are severe and treatment is more complex.[1,2]

Case Summary: A 22-year-old woman presented to a public hospital with a 6-day history of headache, fatigue, nausea, vomiting, and fever. She was hospitalized and treated as typhoid fever for 12 days, then discharged. Four days later, she developed behavioral changes and loss of consciousness. She returned to the public hospital and was referred to a tertiary care center, where she was diagnosed with TB meningitis (TBM) and started on appropriate treatment. Due to delayed recognition, she required 30 days in the intensive care unit and 15 days in the general ward. Although she survived, the late diagnosis resulted in permanent disability, including left hemiparesis and hearing loss.

Discussion: This case emphasizes the importance of early TBM recognition, particularly in patients with prolonged headache. TBM often presents with subtle symptoms and is frequently misdiagnosed, delaying treatment and increasing the risk of poor outcomes. Clinicians, especially general practitioners and non-neurologists, should maintain high suspicion and promptly consult neurology when central nervous system involvement is suspected. Early lumbar puncture and neuroimaging are essential for timely diagnosis. Improving clinical awareness and referral pathways is key to reducing TBM-related morbidity and disability.[3]

Conclusion: Delayed diagnosis of TBM can lead to devastating neurological outcomes. Early recognition and prompt referral are essential to improve survival and preserve neurologic function in affected patients.

Keywords: Tuberculous meningitis, delay diagnosis, severe sequelae, disability

ACUTE MOTOR SENSORY AXONAL NEUROPATHY WITH PRECEEDING HERPES ZOSTER INFECTION

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Introduction. Guillain-Barre syndrome (GBS) is an acute polyradiculopolyneuropathy with varying presentations. GBS usually was preceded by condition called antecedent infection that rarely caused by varicella zoster infection. The incidence rate of GBS after herpes zoster was 0.02% with adjusted hazard ratio to be 18.37.

Case 54 years old male Javanese patient came to neurology clinic because there was sudden bilateral leg weakness that was heavier on right leg with numbness in right leg and aching on left leg. One month before his paralysis there was vesicular skin lesions on his on the right chest to the right back which was diagnosed as herpes zoster. He had history of left sided weakness caused by stroke 9 years ago but there was no history of prior vaccination, immunotherapy, surgery, or infection aside from herpes zoster in this 6 weeks. On neurological examination it was found he had bilateral flaccid leg weakness with medical research council (MRC) sum score 36. Diagnosis was confirmed by albuminocytologic dissociation on cerebrospinal fluid examination and acute motor sensosry axonal neuropathy (AMSAN) subtype of GBS was identified with electroneurography studies. The patient was treated with intravenous immunoglobulin for 5 days. After treatment there was improvement on leg weakness with MRC sum score of 51.

Discussion. GBS is an acute polyradiculoneuropathy with immunological pathomechanism, with AMSAN as one of its subtypes. In half the patients of GBS antecedent infection can be identified mostly of *Campylobacter jejuni* infection but rarely VZV virus infection is the only identified infection. It was found there is 5 per 10.000 cases of GBS in HZV patients. The subtype of GBS related to HZV were predominantly acute inflammatory demyelinating polyradiculoneuropathy (AIDP) but in our case, we found AMSAN.

Conclusion: We present case of GBS with AMSAN subtype that was preceded by only herpes zoster infection.

Keywords: Herpes zoster, Guillain-Barre Syndrome, Acute Motor Sensory Neuropathy

UNEXPECTED TERRITORY: SPINAL CORD INVOLVEMENT IN TOXOPLASMA ENCEPHALITIS - A RARE MANIFESTATION IN NEURO-HIV

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Introduction: *Toxoplasma* is the most common cause of central nervous system infection (CNS) in Human immunodeficiency (HIV) patients, typically affecting the brain, while spinal cord involvement are rarely observed.

Case Description: A 33-year-old HIV-positive female inmate with poor adherence to antiretroviral therapy, recent HIV viral load was 44,605 copies/mL presented with decreased consciousness. On examination, Glasgow coma scale (GCS) Eye 3 Motoric 5 Verbal 4 with reactive isocoric pupils, general weakness, slight facial nerve palsy, left hemiparesis.

Sensoric and autonomic function are difficult to assess. Brain CT showed multiple vasogenic oedemas in the right frontoparietal, left parietal lobes and basal ganglia with midline shift. *Toxoplasma* IgG was positive. Lumbal puncture opening pressure was 35cmH_2O, cerebrospinal fluid (CSF) showed 37 white blood cells (92% MNs), glucose ratio 33%, protein 100 mg/dl. GeneXpert and VDRL were negative, no evidence of bacteria or coccus infection. The patient was treated with dexamethasone 24mg/days (2 doses), clindamycin 4x600mg, pyrimethamine 3 x 50mg and moxifloxacin 1 x 400mg. GCS improved to E3-4M6V4 but tetraparesis was noted. Cervical spine MRI showed a rim-enhancing intramedulary lesion, suggestive of myelitis with abscess. One day after discontinuing dexamethasone, GCS dropped to E2M4V2. Patient died on the next morning, suspected due to brain herniation from cerebral oedema.

Discussion: Toxoplasmosis is the most common CNS opportunistic infection in HIV patients without prophylaxis. Diagnosis is presumptive based on clinical features, imaging, and serology, with no alternative explanation. The spinal lesion was likely related based on imaging. Delayed diagnosis and disease progression contributed to poor outcome.

Conclusions: In HIV patients without prophylaxis and neurological deficits, *Toxoplasma* infection should be considered, in both brain and spinal cord. Early diagnosis, prompt treatment and close monitoring are essential to improve outcomes.

Keywords: Acquired Immune Deficiency Syndrome (AIDS); Cerebral toxoplasmosis; Toxoplasma encephalitis; Human immunodeficiency virus (HIV); Intramedullary spinal cord lesion; Spinal cord Toxoplasmosis

CHALLENGING DIAGNOSIS OF NMDAR ENCEPHALITIS IN A YOUNG WOMAN WITH BIPOLAR DISORDER: SUCCESSFUL RITUXIMAB THERAPY IN A RESOURCE-LIMITED SETTING: A CASE REPORT

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Background: N-methyl-D-aspartate receptor (NMDAR) encephalitis is an autoimmune neurological disorder often initially presenting with psychiatric symptoms. This presentation frequently leads to delayed diagnosis and treatment due to symptom overlap with primary psychiatric conditions. Early and accurate diagnosis is essential for favorable outcomes.

Case Presentation: A 20-year-old female with a pre-existing diagnosis of bipolar affective disorder, managed with Aripiprazole and Lorazepam, was admitted three times over two months for seizures occurring up to 15 times daily. Seizures involved ocular deviation, automatisms of limbs and orofacial movements, with progressively worsening consciousness. The patient also experienced prolonged fever and cough prior to admission, initially confounding the clinical picture.

Diagnostic Findings: NMDAR encephalitis was diagnosed through clinical features and confirmed by the presence of anti-NMDAR antibodies in cerebrospinal fluid (CSF). Supportive investigations including electroencephalography (EEG) and brain magnetic resonance imaging (MRI) showed findings consistent with autoimmune encephalitis. Infectious causes and other differential diagnoses were ruled out. Initial treatment with intravenous methylprednisolone showed limited efficacy. According to guidelines, intravenous immunoglobulin (IVIG) and plasmapheresis are recommended in such cases. However, due to constraints in equipment and financial factors, Rituximab was administered as an alternative immunotherapy, resulting in clinical improvement and enhanced activity of daily living (ADL) scores.

Conclusion: This case underscores the diagnostic challenges posed by psychiatric symptom predominance in early NMDAR encephalitis, leading to treatment delays. The case advocates adapting treatment protocols in resource-limited settings by incorporating Rituximab when standard therapies are not feasible. Early recognition and tailored immunotherapy improve neurological outcomes and quality of life for affected patients.

Keywords: NMDAR encephalitis, Autoimmune encephalitis, Neuropsychiatric symptoms

PARENCHYMAL AND EXTRAPARENCHYMAL NEUROCYSTICERCOSIS: A CASE REPORT

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Neurocysticercosis (NCC), an infection of central nervous system caused by larval stadium of pork tapeworm *Taenia solium* still become health problem in its endemic area. We presented a case report of a 59 years old male patient form East Nusa Tenggara who was referred to Prof. Dr I.G.N.G Ngoerah Denpasar with diffuse cysticercosis including parenchymal and extraparenchymal NCC. Patient experienced multiple episodes of focal to bilateral seizure with < 5 minutes duration of each seizure. Between seizures, patient was unconscious and after seizures he did not regain consciousness. This last 2 years patient began to deteriorate in movement and thinking. From head contrast MRI there were multiple round cystic lesions scattered in cortex and grey-white matter junction at bilateral frontal, parietal, temporal and occipital lobes, right nucleus caudatus, left putamen, and bilateral cerebellar hemispheres, hypointense to grey matter with isointense component inside the cysts consistent with dot signs. There was slight widening of lateral and fourth ventricle with Evan's ratio 0.38 suggesting communicating hydrocephalus with thin wall of cyst seen in the fourth ventricle. Multiple subcutaneous and intramuscular cysts were also found distributed in head, jaw, neck and chest. Patient underwent surgery for ventriculoperitoneal insertion, he was given intravenous dexamethasone with dose 0.5 mg/kg/day tapered down gradually for antiinflammation and 15 mg/kg/day albendazole orally as antiparasitic drug for 2 weeks. During hospitalization patient showed improvement of consciousness and seizure and was discharged after 12 days with cognitive impairment as sequelae.

Keywords: Neurocysticercosis, intraparenchymal, extraparenchymal, *Taenia solium*

MANIFESTATIONS OF VISUAL AND AUDITORY HALLUCINATIONS IN THE ACUTE PHASE OF STREPTOCOCCUS SUIS MENINGOENCEPHALITIS

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Introduction: *Streptococcus suis* meningoencephalitis is a severe zoonotic infection caused by Streptococcus suis. Common symptoms include acute onset of high fever, intense headache, neck stiffness. Although uncommon, hallucinations may occur as part of the clinical presentation in central nervous system infections caused by Streptococcus. Their presence suggests a critical condition requiring immediate medical attention. This case report describes an adult patient with S. suis meningoencephalitis who developed visual and auditory hallucinations during the acute phase of the illness.

Case Description: A 61-year-old male presented to the emergency department reporting a one-day history of high-grade fever, headache, and vomiting. During observation, he became increasingly restless and progressively difficult to rouse. One week prior, he had prepared and consumed a traditional dish, *lawar* containing raw pig's blood. On examination, he was somnolent, febrile, and exhibited nuchal rigidity. Cerebrospinal fluid culture grew *Streptococcus suis*. He was started on dexamethasone and ceftriaxone. After two days, his consciousness gradually improved. He subsequently experienced visual hallucinations, low-pitched tinnitus and auditory hallucinations resembling distant conversations, any prior history of psychotic disorders are denied. These symptoms persisted for 14 days during hospitalization, during which haloperidol was added. At discharge and follow-up, all hallucinations had resolved.

Discussion: The exact mechanism underlying the occurrence of auditory and visual hallucinations in patients with meningoencephalitis remains poorly understood. Functional MRI findings have demonstrated spontaneous activation of auditory networks. Inflammatory processes may activate the thalamus-amygdala pathway, triggering emotional responses to auditory hallucinations. This is further supported by studies

showing abnormalities in the choline to N-acetylaspartate ratio in the thalamus. Neuroimaging studies have also reported increased D2 receptor density within the striatal system and elevated 5HT2A receptor density in the caudate nucleus.

Conclusion: The occurrence of hallucinations in meningoencephalitis, particularly those caused by Streptococcus suis infection, is rarely observed and remains infrequently discussed in the literature. This phenomenon suggests that the inflammatory process may activate specific neural pathways leading to the emergence of hallucinatory symptoms.

Keywords: Streptococcus suis, meningoencephalitis, hallucination

CENTRAL NERVOUS SYSTEM TUBERCULOSIS MANIFESTED AS HYDROCEPHALUS AND SIADH: EXPLORING THE HIDDEN CLUES

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Background: Clinical manifestation of Tuberculosis in Central Nervous System (CNS) is usually not specific for the disease. One of the extra-neural manifestations of Tuberculosis complication of CNS is hyponatremia. This case report highlighted atypical clinical manifestation of neurological complication of tuberculosis.

Case Report: Female, 39 years old was brought to the emergency department due to decrease of consciousness ±6 hours before admission. Patient complained about severely progressive headache two weeks before. Neurological finding: GCS E2M4V2, no nuchal rigidity. Laboratory finding: Natrium blood level 115mmol/L; Natrium urine level 5,6g/24h (245meq/24h). Chest x-ray and head CT scan displayed unremarkable results. Correction with 3%NaCl improved the patient' consciousness temporary. On the 6th day, the patient consciousness decreased. Neurological finding: anisocoria (4mm/2mm), insignificant nuchal rigidity. Serial Head CT scan showed hydrocephalus and ventriculoperitoneal shunt was administered. CSF analysis findings were clear, MN Leucocyte 3/µL, glucose 65mg/dL; and normal Ziehl-Neelsen staining. Microbiological examination of sputum showed scanty acid-fast bacilli (AFB) of 3/100 HPF. Lancet Consensus of scoring for TBM scored 12 (probable TBM). The patient was treated with Anti Tuberculosis Drug.

Discussion: One of the most common complications of TB in CNS is tuberculous meningitis. Hyponatremia in tuberculosis usually associated with the development of syndrome of inappropriate antidiuretic hormone (SIADH) or cerebral salt wasting syndrome (CSWS). Tuberculous meningitis characterized with gelatinous rich exudate. The exudate cause disruption of CSF flow that resulted in hydrocephalus. The exudate also caused irritation of the hypothalamus and pituitary gland which manifested as SIADH or CSWS. The patient was treated with Anti Tuberculosis Drug despite unspecific microbiological and laboratory analysis finding of CSF.

Conclusion: This case report represented challenges in diagnosis of CNS TB. Both neurological and extra-neural manifestations have vital role in diagnosis to prevent treatment delay.

Keywords: Hydrocephalus, SIADH, Tuberculosis

TUBEROUS SCLEROSIS COMPLEX – ASSOCIATED NEUROPSYCHIATRY DISORDER (TAND)

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Introduction: Tuberous Sclerosis (TS) Complex (TSC) is characterized by hamartoma that affects the brain, skin, eyes, heart, lungs, and kidneys. Neurological, neuropsychiatric, and kidney complications are the greatest burden of the disease of all TSC-related complications. Patient with TSC have also behaviour (cognitive and non cognitive) symptoms, called TSC – Associated Neuropscychiatry Disorder (TAND). Existing symptoms includes six areas: Neurobehavioral, psychiatric, intellectual, academic, neuropsychological, and psychosocial.

Case Description: In this case report, a 26th years old women, was consulted with Suspect TAND, secondary epileptic seizures caused by tuberous sclerosis. She has history of seizures since 3 years ago possible caused by TS, has neuropsychiatric symptoms (visual hallucination, anxious) when getting seizure. From memory evaluation, there was cognitive impairment in recent and delayed memory functions, mildly disrupted language function in naming, and disrupted executive function in Trail Making Test. In head MRI, there was a right left occipital sulci abnormality (cortical dysplasia), septum pellucidum agenesis, and subependymal lateral wall nodul of the left ventricle, which was still possible TS Mega sisterna magna. From memory evaluation, had resulted that the patient has Mild Cognitive Impairment with neuropsychiatric symptoms.

Discussion: TAND covers neurocognitive, neurobehavioral, and neuropsychiatric disorders. MRI can used to diagnose, which will look like tubers spread diffusely in white matter (abnormally microstructure). Cortical tubers are benign hamartomas detected in the cerebral cortex (95%) of patients with TSC, including epilepsy, cognitive disability, and neurobehavioural abnormalities. Screening at least annually and follow up with appropriate action. The goal is early identification and early intervention for better prognosis.

Conclusion: Patient with TAND must be treated in multi-diciplinary aspects. The management approach for TSC must be taken in view of its broad clinical spectrum because the disease is still incurable. The treatment emphasizes a multidisciplinary approach throughout the patient's age, for all organ systems.

Keywords: Tuberous Sclerosis Complex – Associated Neuropscychiatry Disorder, behavioral changes

APPROACH TO DRUG HYPERSENSITIVITY IN TOXOPLASMA ENCEPHALITIS: WHAT NEUROLOGIST NEEDS TO KNOW

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Background: Drug hypersensitivity reactions (DHRs) occur 100 times more frequently in HIV patients than in general population, due to immune dysregulation. Toxoplasma encephalitis (TE) is a common opportunistic infection in advanced HIV disease (AHD). Managing TE is particularly challenging due to the high prevalence of drug hypersensitivity and limited alternative treatments.. Many drug of choice for TE, including pyrimethamine, sulfonamides, and trimethoprim-sulfamethoxazole (TMP-SMX), are known to trigger allergic reactions. In this case series, we describe patients with TE who exhibited varying clinical manifestations of drug hypersensitivity and outline the approaches used in their management.

Cases: Three cases of TE in AHD were reported. The first and second cases exhibited mild hypersensitivity, while the third case developed Stevens-Johnson syndrome (SJS) following a combination of antibiotic and antiepileptic treatments. The suspected drugs in these cases were pyrimethamine, clindamycin, TMP-SM, phenytoin and fluconazole. We largely discontinued all drugs except alternative toxoplasma therapy. The first case continued clindamycin due to an ongoing reaction. The third case received azithromycin before a TMP-SMX drug provocation test. The second and third cases tested negative and resumed TMP-SMX. All three patients showed improvement clinically and radiologically, although the second case experienced hemiparesis as a sequela.

Discussion: HIV-related immune dysregulation and polypharmacy increase susceptibility to allergic reactions, often as cutaneous adverse drug reactions (CADRs) or severe SJS or toxic epidermal necrolysis (TEN). Mild reactions may be assessed with DPT, while severe cases require immediate drug discontinuation. Azithromycin proved effective for hypersensitivity to first-line therapy. TMP-SMX, the most common cause of mild hypersensitivity in PLWH, is now preferred over pyrimethamine for TE due to its reduced risk of multi-drug hypersensitivity.

Conclusion: The management of drug hypersensitivity in TE requires a tailored approach, balancing effective antimicrobial therapy with lowering allergic risks.

Keywords: Toxoplasma Encephalitis, HIV, drug hypersensitivity, drug provocation test (DPT)

A CASE REPORT: ABSENCE OF IMMUNOCOMPROMISED SYMPTOMS IN A PATIENT WITH PNEUMOCOCCAL MENINGOENCEPHALITIS UNDERGOING IMMUNOSUPPRESSANT THERAPY FOR SEVERE PLAQUE PSORIASIS

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Introduction: Meningoencephalitis is an inflammation of the meninges and brain tissue. One of the main causes of meningitis is streptococcal meningitis. One type of streptococcus is Streptococcus pneumoniae. We report a case report of Streptococcus pneumoniae meningoencephalitis in a patient using immunosuppressant drugs.

Case Report: A 53-year-old man was referred from a regional hospital with complaints of a headache like pressure since 1 day before admission. The headache was said to have occurred together with a fever> 38 degrees Celsius, stiff neck +. On the first to third day of hospitalization, the patient's consciousness was said to be inadequate, the patient tended to be restless and could not follow orders. On the fourth day of treatment, the patient's consciousness returned to being adequate. The patient has a history of psoriasis vulgaris on treatment. The patient had taken methotrexate in 2023 and used cyclosporine in 2024. A complete liquor examination showed signs of bacterial infection. Gram staining examination of CSF results obtained Gram Negative Rod Bacteria: Scanty, CSF culture with isolated results of Streptococcus pneumoniae bacteria.

Discussion: The use of immunosuppressant drugs also causes increased release of endothelin, causing endothelial cell vasoconstriction and causing microvascular damage and damage to the permeability of the blood brain barrier and suppression of the immune system to fight infectious agents are risk factors for meningoencephalitis in this patient.

Conclusion: Streptococcus pneumoniae meningoencephalitis is a case that often occurs in pediatric patients because the child's immune system is still not perfect, but the case that occurred in this patient, namely adulthood caused by the use of immunosuppressant drugs, is a rare case so that it becomes a challenge for clinicians in the future in establishing a diagnosis and understanding the mechanism of Streptococcus pneumoniae meningoencephalitis in the use of immunosuppressants.

Keywords: Meningoencephalitis, Plaque Psoriasis, Streptococcus pneumoniae, Immunosuppressants

DISSEMINATED INTRACRANIAL TUBERCULOMA MIMICKING NEUROCYSTICERCOSIS: DIAGNOSTIC PITFALL IN A YOUNG WOMAN

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Introduction: Intracranial tuberculoma is a manifestation of central nervous system tuberculosis and may closely mimic neurocysticercosis (NCC), especially in TB-endemic regions. Overlapping radiologic features between these two entities can lead to diagnostic pitfalls and inappropriate treatment.

Case Description: A 20-year-old woman presented with progressive headache, vertigo, diplopia, right-sided hemihypesthesia, and left-sided hemiparesis that had developed over three months. Initial brain MRI from the referring hospital revealed multiple small ring-enhancing lesions with perifocal edema, interpreted as compatible with NCC in the granular nodular stage. The patient was treated with a one-month course of albendazole, but showed no clinical improvement. Upon referral, further investigations revealed negative results for stool parasitology, toxoplasma serology, and HIV. The patient denied systemic symptoms of tuberculosis. However, chest imaging showed bilateral pulmonary nodules, and sputum GeneXpert was positive for rifampicin-sensitive Mycobacterium tuberculosis. Repeat MRI prior to treatment initiation showed multiple irregular ring-enhancing lesions, more consistent with tuberculoma. Anti-tuberculosis therapy and corticosteroids were initiated. Follow-up MRIs at three and six months after treatment initiation showed progressive reduction in enhancement and edema. The patient demonstrated marked clinical improvement, with resolution of vertigo, diplopia, and hemiparesis.

Discussion: This case highlights the diagnostic pitfall of differentiating tuberculoma from NCC, particularly when systemic symptoms of tuberculosis are absent. The initial radiologic appearance (multiple small ring-enhancing lesions) closely resembled NCC in the granular nodular stage, leading to delayed appropriate therapy. The lack of response to antiparasitic treatment, microbiologic confirmation, and radiologic improvement following anti-tuberculosis therapy supported the final diagnosis.

Conclusion: In endemic regions, intracranial tuberculoma should be considered in the differential diagnosis of multiple ring-enhancing brain lesions. A multidisciplinary approach combining imaging, clinical evaluation, and microbiological confirmation is essential for accurate diagnosis and prompt initiation of therapy.

Keywords: Intracranial Tuberculoma, Neurocysticercosis, Diagnostic Pitfall

SUCCESSFUL MANAGEMENT OF CEREBRAL TOXOPLASMOSIS USING AN ALTERNATIVE THERAPEUTIC REGIMEN: A CASE REPORT

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Introduction: Cerebral toxoplasmosis is a common opportunistic infection in individuals with advanced HIV/AIDS, traditionally treated with pyrimethamine and sulfadiazine. In resource-limited settings, alternative regimens are essentials when first-line drugs are unavailable. This report presents a case of cerebral toxoplasmosis in an HIV-positive patient treated with an alternative regimen due to limited availability of first-line therapy.

Case Description: A 33-year-old HIV-positive female presented with decreased consciousness preceded by a persistent headache and oral candidiasis. Neurological examination revealed somnolence, tetraparesis, and cranial nerve involvement. Imaging showed multiple hypodense brain lesions with perilesional edema and mild hydrocephalus. A diagnosis of cerebral toxoplasmosis was established in the context of HIV Stage IV, oral candidiasis, tuberculous lymphadenitis, and herpes zoster. Due to unavailability of pyrimethamine and sulfadiazine, the patient received high-dose cotrimoxazole (960 mg twice daily) and clindamycin (600 mg four times daily), alongside adjunctive corticosteroids, antivirals, antifungals, and supportive care. Marked clinical improvement was observed within one week of therapy. Upon discharge after two weeks, the patient was alert, communicative, and had partial motor recovery. Continued improvement was noted at follow-up.

Discussion: While pyrimethamine-based regimens remain the gold standard for cerebral toxoplasmosis, limited availability often necessitates alternative approaches. The combination of cotrimoxazole and clindamycin has shown comparable efficacy, especially in resource-limited settings, offering a practical and evidence-supported

Conclusion: This case highlights the successful use of clindamycin and cotrimoxazole as an alternative treatment for cerebral toxoplasmosis in the absence of standard therapy. It underscores the importance of flexible, evidence-based approaches in managing opportunistic infections in HIV, particularly in resource-limited settings.

Keywords: cerebral toxoplasmosis, HIV/AIDS, opportunistic infection, cotrimoxazole, clindamycin

CENTRAL NERVOUS SYSTEM TUBERCULOMA MASQUERADING AS AN INTRACRANIAL NEOPLASM: A DIAGNOSTIC CHALLENGE

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Introduction: Hematogenous dissemination of *Mycobacterium tuberculosis* (MT) to the Central Nervous System (CNS) occurs in approximately 5% to 8% of extrapulmonary tuberculosis cases in immunocompetent individuals. An intracranial tuberculoma, which may be caseating or non-caseating, represents one form of CNS involvement located in the brain parenchyma. These lesions often mimic intracranial neoplasms due to their non-specific clinical presentation and radiological findings, frequently leading to diagnostic challenges and misdiagnosis.

Case Description: A 21-year-old man was referred from a tertiary care hospital with a presumptive diagnosis of cerebral tumor. He presented with progressive loss of consciousness over three days, preceded by a three-month history of worsening high-pressure headache, nausea, and intermittent low-grade fever. Notably, He had close contact with his father, who had active pulmonary TB. His blood pressure was 119/78 mmHg, Glasgow Coma Scale (GCS) E3M5V3, temperature 38.8°C, isochoric pupils, positive light reflex, and no meningeal signs. He was intubated and admitted to the intensive care unit (ICU). Cerebrospinal fluid (CSF) analysis showed xanthochromia, mononuclear pleocytosis, elevated protein concentration, and decreased glucose. Sputum was acid-fast bacilli (AFB)-positive and rifampicin-sensitive. Magnetic resonance imaging (MRI) revealed a ring-enhancing solid nodule in the right cerebellum with vasogenic edema and obstructive hydrocephalus, suggestive of a caseating tuberculoma. Histopathology showed gliosis and necrosis without tumor cells. He survived with anti-tuberculosis and steroid treatment.

Discussion: Tuberculosis remains one of the most significant infectious diseases worldwide, associated with substantial morbidity and mortality due to infection with the MT complex. Diagnosis of CNS tuberculosis is often delayed and challenging due to its diverse and non-specific clinical manifestations

Conclusion: A comprehensive approach including clinical progression, imaging, histopathological analysis, and monitoring of the clinical course of CNS tuberculosis is crucial to facilitate prompt diagnosis and appropriate management.

Keywords: Intracranial Tuberculoma, Central Nervous system Tuberculosis, Brain Neoplasm, Meningeal Tuberculosis

DIAGNOSTIC CHALLENGES IN OTOGENIC CEREBELLAR ABSCESS

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Introduction: Cerebellar abscess is a suppurative infectious disease that forms a capsule located in the cerebellum. The cause of cerebellar abscess is a chronic infection that is not resolved properly such as middle ear, dental, and mastoid bone infection. Chronic Suppurative Otitis Media (CSOM) is one of the main causes of cerebellar abscess. The pathological cause of cerebellar abscess is cholesteatoma which produces enzymes cause bone demineralization. Diagnosis of cerebellar abscess is challenging as symptoms can be nonspecific to other neurological disorders, so the diagnosis is often delayed, which increased risk of serious complications such as brain herniation.

Case Description: A 55-year-old woman came to emergency room of Mangusada Hospital with a decreased of consciousness (DOC) 4 days ago. Initially the patient complained of medium-heavy intensity headache and vomiting. Patient got fever very high up to 40C. Previously, patient was diagnosed as bacterial meningitis, but the blood culture was no growth. The patient received antibiotics for 14 days, then patient was discharged. A few days after being discharged the patient had experienced ear pain with discharge. The patient is DOC GCS E3V2M5, no impression of lateralization. Laboratory showed leukocytosis, head CT-Scan with contrast obtained multiple infratentorial intra axial cystic lesions in the left hemisphere of the cerebellum accompanied by perifocal edema around it that constricted ventricle, causing active non-communicating hydrocephalus, suggesting cerebellum abscess. Cerebral edema, right mastoiditis, and left mastoid air cell hyper pneumatization.

Discussion: CSOM is one of the main causes of cerebellar abscess. The pathology is cholesteatoma which produces enzymes that cause bone demineralization. Head contrast CT scan is essential to diagnose brain abscess then confirmed if pus is found from the abscess site. The patient was referred and consulted for external decompression of hydrocephalus and evacuation of the abscess. Empirical antibiotic therapy should be based on the underlying etiologic agent. LCS culture was also performed during the current hospitalization period but the result was also no growth. In this case, the patient was diagnosed as bacterial meningitis 4 months before and received antibiotics for 14 days. Where two months later the patient again experienced DOC and was given antibiotic treatment (Ceftriaxone and Metronidazole) for 28 days. So that the patient can go home with full consciousness. Then 3 weeks later the patient came back with DOC. According to initial stage of cerebritis can be treated with antibiotics for a shorter period of 4-6 weeks. However, patients with abscess encapsulation, tissue necrosis, uncontrolled abscess growth, multiple abscesses, lesions in vital locations, and immunocompromised, require 6-8 weeks. Initial antibiotic administration is done intravenously, followed by 2-6 months of oral therapy. Antibiotic penetration is poor through the blood-brain barrier, so antibiotic choice is limited and maximal doses are required. This case report patient was at the encapsulation stage, so the patient was considered for long-term antibiotic use.

Conclusion: Head contrast CT scan is essential for diagnosis brain abscess, MRI with contrast is more sensitive, but not always available. It is important knowing the stage of cerebellar abscess. The sooner cerebellar abscess is diagnosed, the faster the therapy is carried out, complication of hydrocephalus can be avoided. So the patient's clinical outcome is good.

Keywords: diagnosis, abscess, cerebellum

BILATERAL ABDUCENS NERVE PALSY AS THE INITIAL CLINICAL MANIFESTATION OF MENINGITIS

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Introduction: Isolated bilateral abducens palsy is a rare, making up for only <10%, symptom of central nervous system infection, which is a medical emergency that could lead to morbidity and mortality if left untreated.

Case Description: We report a case of a 35-year-old male presenting with high fever, double vision, history of travel to Congo, and no history of pulmonary tuberculosis. The patient was admitted to internal medicine and then consulted to neurology. Physical examination showed nuchal rigidity and bilateral abducens palsy. During diagnostic workup, we found leukocytosis (12.53 × 10^3), negative malaria tests, normal chest x-ray, and normal non-contrast head CT scan. Lumbar puncture showed pleocytosis (130 WBC/uL) with slight predominance of mononuclear cells (54%), yet a negative PCR test for M. Tuberculosis. The HIV test was negative. The patient was diagnosed with bacterial meningitis with a differential diagnosis of Tuberculosis meningitis and treated with Ceftriaxone 2x2g IV (intravenous), Levofloxacin 1x750mg IV, and Dexamethasone 4x10mg IV. The patient was referred to a greater hospital for brain imaging re-evaluation and blood culture.

Discussion: Bilateral abducens palsy in meningitis could be caused by elevated intracranial pressure or hydrocephalus. In cases in which abducens palsy happens without such abnormalities present, vasculitis was the most common etiology. Lumbar punctures in bacterial meningitis usually are predominated by PMN, however, several cases have initial presentation of MN predominance on early tests.

Conclusion: This case highlights isolated bilateral abducens palsy as one of the presenting symptoms of bacterial meningitis. Recognizing it as a symptom of meningitis is important as it would lead to more prompt treatment.

PITFALLS IN DIAGNOSING MYELITIS: A RARE CASE OF SPONTANEOUS SPINAL EPIDURAL HEMATOMA IN PREGNANCY

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Introduction: Spontaneous Spinal Epidural Hematoma (SSEH) is a rare neurological condition characterized by spontaneous bleeding in the epidural space without prior trauma. Although often idiopathic, it can be triggered by factors such as coagulation dysfunction, vascular malformations and pregnancy. Early diagnosis of SSEH is challenging due to its nonspecific presentation, which often mimics other conditions. Sudden onset back pain and progressive limb weakness are common clinical features. This case report presents a rare occurrence of SSEH during pregnancy, highlighting the importance of early recognition and comprehensive management to prevent permanent neurological deficits.

Case Report: A 24-year-old pregnant woman presented with sudden onset of neck pain, accompanied by tingling sensations and progressive weakness in all four limbs, without any history of trauma, two days prior to hospital admission. She had a history of fever one month earlier. Neurological examination revealed quadriparesis, hypoesthesia below the C5 level, proprioceptive impairment, urinary and fecal incontinence. Laboratory examination showed leukocytosis. Spinal MRI examination showed an extramedullary hypointense lesion at the level of C5 to C6 suggestive of mass and calcification with a differential diagnosis of inflammation. After consultation with a neurosurgeon, SSEH was suspected. The patient subsequently underwent hemilaminectomy and hematoma evacuation. Intraoperative findings revealed a blood clot extending from C 4 to C 6.

Discussion: SSEH is a rare condition with risk factors such as coagulation disorders, vascular malformations and pregnancy. In this case, both MRI findings and intraoperative observation confirmed the diagnosis of SSEH. It was suspected that epidural vascular rupture secondary to increased central venous pressure during pregnancy. Decompressive laminectomy and hematoma evacuation were performed to relieve spinal cord compression, restore blood flow and improve neurological function.

Conclusion: Although SSEH is a rare condition, early diagnosis and prompt intervention are crucial to prevent permanent neurological deficits.

Keywords: SSEH, EDH, pregnancy

CRYPTOCOCCAL MENINGITIS IN IMMUNOCOMPETENT PATIENTS: A CASE SERIES

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Background: Cryptococcus caused by *C.Neoformans* is a fungal infection that occurs in 19% of AIDS-related deaths. Although it is common in HIV patients, cases in immunocompetent individuals are increasing. Limited access to antifungals ampoterisin-B, worsens outputs in resource-constrained areas [1]. This case describes an immunocompetent patient with Cryptococcal meningitis.

Case Series: Male patient 58 y.o, with decreased consciousness for 4 days. Previously, the patient experienced severe headaches, accompanied by fever, as well as one episode of tonic-clonic seizures for 30 second. Serology of HIV (-) and CD4 445 cells/µL. CSF analysis showed increased intracranial pressure, lymphocytosis, and Cryptococcus spp. After 14 days of IV therapy of fluconazole 800 mg/day, the patient experienced clinical improvement with residual symptoms.

The second patient, a 41 y.o man, had severe headaches, dizziness and difficulty walking. The diagnosis of CM was established based on CSF analysis showing an opening pressure of 39 cm H_2O as well as the discovery of capsuled yeast. The HIV test was negative, and the CD4 value was 589 cells/µL. The patient was given IV fluconazole 800 mg/day, on day 10 the patient improved.

Discussion: Two cases of C.meningitis in immunocompetent patients showed clinical improvement after administration of fluconazole therapy. Adequate intracranial pressure management, early initiation of antifungal therapy plays an important role in reducing mortality rates. The increase in cases in non-HIV patients demands high clinical vigilance as well as improvements in diagnostic efforts. [2,3]

Conclusion: Cryptococcal meningitis is a relatively rare condition in individuals with immunocompetent conditions. Nevertheless, C.meningitis without a known immunodeficiency condition has a mortality rate of 12% and is often late in clinical presentation due to the often subacute nature of symptom development. Therefore, early diagnosis should be considered and sought in any patient with signs and symptoms of meningitis, lymphocytic CSF findings, and increased pressure.

Keywords: Cryptococcal meningitis, immunocompetent

CALCIFIED NEUROCYSTICERCOSIS WITH A HISTORY OF OCULAR TOXOPLASMOSIS IN A 22-YEAR-OLD WOMAN: A RARE CASE REPORT

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Background: Neurocysticercosis (NCC) is the most prevalent helminthic infection of the central nervous system and a significant public health concern in low- and middle-income countries (LMICs), including Southeast Asia. Although historically associated with rural settings, recent data suggest that urban populations are also affected, with up to 29.2% of calcified NCC cases reported in urban residents. While calcified NCC is typically considered inactive, it may still produce chronic neurological symptoms such as headache. This case highlights symptomatic calcified NCC in an urban young adult, underscoring the need for diagnostic vigilance in urban settings within an endemic region.

Case Presentation: We report the case of a 22-year-old woman from an urban area in Java, Indonesia, with a two-year history of chronic headache and episode of vomiting. Her medical history included ocular toxoplasmosis with visual impairment. Non-contrast brain CT revealed multiple calcified nodules scattered in the cortical and subcortical regions of both cerebral hemispheres, consistent with the calcified stage of NCC. There was no evidence of cerebral edema, hydrocephalus, or raised intracranial pressure. She was managed with symptomatic treatment and scheduled for outpatient follow-up.

Discussion: This case illustrates that calcified NCC, although radiologically inactive, can remain clinically significant and contribute to persistent neurological symptoms. A prior history of ocular toxoplasmosis presents a diagnostic challenge, particularly in patients with overlapping symptoms and no rural exposure. In endemic regions, brain CT remains an essential diagnostic tool, especially where advanced neuroimaging modalities are not readily available. NCC should be considered in the differential diagnosis of chronic headache.

Conclusion: Clinicians in urban areas within endemic regions should maintain a high index of suspicion for NCC in patients presenting with unexplained chronic headache. Early recognition and appropriate management can improve clinical outcomes.

Keywords: chronic headache, endemic regions, neurocysticercosis, ocular toxoplasmosis

MENINGITIS BEYOND THE ACUTE PHASE: WHEN DELAYED ONSET SUGGESTS A MISSED CSF – A CASE REPORT

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Introduction: Bacterial meningitis is a life threatening condition that typically presents within 3 months of cranial trauma or neurosurgical procedures. Delayed onset meningitis occurring months to years after the inciting event is exceedingly rare but poorly documented phenomena.

Case Description: We report the case of a 17-year-old male with a history of craniotomy for hematoma evacuation following a traumatic intracerebral hemorrhage (ICH) one year prior, who presented with a worsening headache for the past two days, accompanied by fever, nausea, and vomiting. Physical examination revealed positive nuchal rigidity and a positive halo sign prior to symptom onset which raised suspicion of CSF leakage. Laboratory investigations showed marked leukocytosis (26,400/µL). CSF analysis revealed suggestive findings of bacterial meningitis. These findings raised concern for a CSF fistula as a potential entry point for infection, possibly a delayed onset meningitis post-traumatic or post-surgical bacterial meningitis.

Discussion: Cerebrospinal fluid (CSF) leak is a known complication of skull base fractures. The breach of both bone and dura results in direct communication between the subarachnoid space and the upper aerodigestive tract, predisposing the patient to bacterial meningitis with 30% incidences. CSF leaks may occur months and years after neurosurgery and traumatic brain injury due to bone resorption, scar tissue contraction, or fluctuating intracranial pressure. Post-traumatic bone splinters can create osteodural and mucosal tears, forming a conduit for pathogen entry.

Conclusion: The mortality for bacterial meningitis varies from 10-15%. Survival depends on early recognition of acute bacterial meningitis and administration of appropriate antibiotic therapy. If CSF leak persists, surgical options such as endoscopic endonasal repair, bicoronal craniotomy with dural repair, frontal sinus cranialization and vascularized pericranial flap may be needed. Hence, awareness of this potential complication is essential for prevention of neurologic sequelae.

Keywords: Bacterial Meningitis, Cranial Trauma, Neurosurgical Procedures

AGGRESSIVE MULTIFOCAL MULTIPLE SCLEROSIS IN A YOUNG MALE PRESENTING WITH BRAINSTEM, CEREBELLAR, AND SPINAL CORD INVOLVEMENT: A CASE REPORT

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Introduction: Multiple sclerosis (MS) is an autoimmune disease caused by demyelination in the central nervous system and most commonly affects young women. Aggressive multifocal MS involving the brainstem, cerebellum, and spinal cord at onset is rare, especially in young males, and raises significant diagnostic and therapeutic challenges.

Case Description: We report a 30-year-old man who initially presented with diplopia, blurry vision, and left-sided weakness. Examination revealed right visual impairment, horizontal nystagmus, right central facial and hypoglossal nerve palsies, and bilateral weakness more pronounced on the left. Over several months, symptoms progressed to bilateral weakness and stiffness, slurred speech, sensory deficits, and mild bladder and bowel dysfunction. Neurologic examination showed nystagmus, cranial nerve palsies (olfactory, optic, hypoglossal), spastic quadriparesis, truncal ataxia, titubation, intention tremor, positive Babinski signs, and sensory loss below T8. Brain MRI revealed multifocal lesions in the centrum semiovale, subcortical frontal and parietal lobes, anterior temporal lobes, thalami, internal capsule, pons, cerebellum, and spinal cord. Spinal MRI showed short-segment intramedullary lesions at the cervical and thoracic levels. CSF and other investigations were unremarkable. Alternative diagnoses such as CADASIL were considered, but clinical and imaging findings strongly supported MS. He was treated with corticosteroids and azathioprine, along with symptomatic and neuroprotective therapies. However, his disease remained highly active with frequent relapses, incomplete recovery, and gradual accumulation of neurologic deficits.

Discussion: This case illustrates a rare, aggressive form of MS in young male, with extensive brainstem and spinal cord involvement and frequent relapses despite standard therapies. Early recognition and timely escalation to high-efficacy therapy are critical to prevent irreversible disability.

Conclusion: Although aggressive multifocal MS is uncommon in young males, early diagnosis and treatment are essential to reduce the risk of irreversible disability and optimize long-term outcomes.

Keywords: Multiple sclerosis, brainstem lesion, spinal cord lesion, movement disorder, aggressive MS

NEUROLOGIC INVOLVEMENT IN VOGT-KOYANAGI-HARADA DISEASE: A CASE REPORT

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Background: Vogt-Koyanagi-Harada (VKH) syndrome is a rare autoimmune condition that affects melanocyte-rich tissues and often presents with neurological, ocular, and dermatological symptoms, making early diagnosis challenging.

Case Illustration: A 24-year-old woman presented with headache, tinnitus and progressive bilateral visual loss, later diagnosed with Vogt-Koyanagi-Harada (VKH) syndrome based on clinical findings and cerebrospinal fluid analysis, showing significant improvement after high-dose intravenous corticosteroid therapy.

Discussion: Vogt- Koyanagi-Harada (VKH) disease is an autoimmune condition that targets melanocyte-rich tissues, especially in the eyes, central nervous system, ears, and skin. Typically begins with a prodromal phase (headache, tinnitus, and neck stiffness), followed by acute uveitis, which includes blurry vision and exudative retinal detachment. Diagnosis is often clinical, supported by imaging like MRI and tests such as cerebrospinal fluid (CSF) analysis, which often shows lymphocytic pleocytosis. Treatment starts with high-dose corticosteroids, given intravenously or orally, to control inflammation. Non-steroidal immunosuppressants like methotrexate can be added for long-term control or when corticosteroids are not enough. Early treatment improves outcomes and helps prevent progression to the chronic phase.

Conclusion: Diagnosis of VKH is mainly clinical, supported by eye exams, imaging, and sometimes spinal fluid tests. Treatment begins with high-dose steroids to reduce inflammation, followed by immunosuppressive drugs like methotrexate if needed for long-term control.

Keywords: Vogt-Koyanagi Harada Disease, Neurologic Involvement, Methyl-prednisolon

VISUAL HALLUCINATION IN RELEASE PHENOMENON OF CHARLES BONNET SYNDROME

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Introduction: Charles bonnet syndrome (CBS) or phantom vision is a condition in which visual hallucination occurs, mostly in individuals with visual impairment. They are fully aware that the hallucination isn't real. CBS occurs in 11-15% individuals with visual impairment. In some individuals, the hallucination is disturbing even affecting their quality of life.

Case Description: An 83-year-old man came to the neurology department with a chief complaint of seeing human shadow on the right eye since a week before admission. He had undergone right eye vitrectomy and age-related macular degeneration on the left eye. His visual acuity was 1/300 (right eye) and 6/60 (left eye). Radiology finding and electroencephalography result were within normal limit. He was treated with gabapentin and mecobalamin. His symptom disappeared after two weeks of treatment.

Discussion: The form of the visual hallucination depends on which brain area is affected. Visual hallucination in CBS results from deafferentiation on the visual association cortex. When the visual sensory input decreases

because of diseases affecting the eyes or visual pathway, there is an increase in excitability and firing of neurons on the visual association cortex thus resulting in visual hallucination.

Conclusion: CBS should be considered in individuals with visual hallucination and vision impairment. CBS is a diagnosis of exclusion, thus excluding another possible diagnosis in which visual hallucination is present is important.

Keywords: charles bonnet syndrome, visual hallucination, visual impairment

ACUTE BEHAVIORAL CHANGES AS INITIAL SYMPTOM OF OBSTRUCTIVE HYDROCEPHALUS CAUSED BY VERTEBROBASILAR DOLICHOECTASIA

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Background: Vertebrobasilar dolichoectasia (VBD) is a rare vascular anomaly characterized by elongation, tortuosity, and dilatation of the vertebral and basilar arteries. While often asymptomatic, VBD can cause complications due to compression of adjacent structures, such as obstructive hydrocephalus.

Case Illustration: We report the case of a 54-year-old male presenting with acute behavioral changes such as repeating questions, incoherent speech, followed by gradually decreased of consciousness. Neurological examination revealed a Glasgow Coma Scale of Eye 1, Verbal 1, and Motoric 2, without lateralization. Non-contrast head CT demonstrated obstructive hydrocephalus, prompting emergency extra ventricular drainage followed by ventriculoperitoneal (VP) shunt. Postoperative improvement was observed. Digital Subtraction Angiography (DSA) confirmed malignant VBD with a basilar artery diameter of 8.17 mm and length of 64.68 mm.

Discussion: The etiology of VBD remains unclear. VBD primarily affects the posterior circulation due to reduced sympathetic trophic support. Hydrocephalus in VBD can result from direct compression of CSF pathways (obstruction-visible) or pulsatile pressure disturbances (obstruction-invisible). In this case, obstructive hydrocephalus manifested as acute behavioural changes followed by gradual decreased of consciousness.

Conclusion: This case highlights the importance of recognizing VBD as a rare cause of acute behavioral changes. Accurate diagnosis through imaging and timely intervention, such as VP shunt, are critical to improving outcomes in patients with severe complications of VBD.

Keywords: Acute behavioral changes, Vertebrobasilar dolichoectasia, Obstructive hydrocephalus

COGNITIVE IMPAIRMENT AS A SYMPTOM FOR ISCHEMIC STROKE – A CASE REPORT

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Introduction: Cognition refers to the brain's ability to understand, identify, memorize, and remember complex stimuli as a fundamental aspect of brain function. Cognitive impairment is defined as a disorder in one or more cognitive domains. It can be a common complication of the acute phase of stroke, which can be temporary or permanent.

Case: A 59-year-old female was brought to the ER because of confusion since 3 days before. She also felt nauseous and vomited while walking and since then she answered questions slowly and frequently confused and forgetful. Her family said she had no self-care, even had no urge to eat. At that time she didn't have slurred speech or other symptoms such as one sided weakness, headache. It was only after being taken to the Emergency Room that her family realized that her voice was more slurred than usual. No. other complains existed. From physical examination, GCS was E4V5M6, there were slight paresis of right cranial nerves VII and XII supra-nuclear, right flaccid hemiparesis grade 4+, right and left Babinski reflex. From non contrast head CT, there was a hypo-dense lesion in the left thalamus adjacent to the 3rd ventricle. She then examined for MMSE in the ward on day 7 onset, and had the result of 16 (definite cognitive impairment). Clock drawing test (CDT) was 7 (cognitive impairment). Hachinski score was 9 (vascular dementia). She was diagnosed with acute infarction stroke due to thrombus

Conclusion: Cognitive manifestations in thalamic stroke are thalamic amnesia and thalamic dementia. In this patient, thalamic dementia was found, which is characterized by disorientation of place and time (spatial and temporal), behavioral changes, and disorders of executive function. Therefore, in patients with acute cognitive impairment, it can be considered for the differential diagnosis of acute infarction stroke.

MILD COGNITIVE IMPAIRMENT AFTER RADIOTHERAPY IN PATIENTS WITH METASTATIC BRAIN TUMOR

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Introduction: The treatment of choice for metastatic brain tumors is whole brain radiotherapy (WBRT), a simple and non-invasive method. Whole Brain Radiotherapy can reduce tumor volume, improve clinical symptoms, and prolong life expectancy and reduce mortality. It also has side effects in the form of neurotoxicity due to exposure to ionizing radiation throughout the brain parenchyma. One form of side effect of brain radiation that is often found is impaired cognitive function

Case Description: A 59-year-old female patient presented with complaints of memory decline that has been ongoing for approximately the past 3 months. The patient reported frequent forgetfulness when looking for items or recalling where she placed them. She also occasionally forgets the topic of conversation that was just discussed. Despite these issues, the patient remains capable of performing daily activities independently. The patient has a history of brain tumor diagnosed in June 2023 and has completed 20 sessions of Whole Brain Radiotherapy. Neurobehavioral examination revealed the following **Results:** MOCA-INA score of 22/30, MMSE 27/30, ADL score 1, IADL score 4, AD-8 score 3, and CDR 0.5; indicating a diagnosis of Mild Cognitive Impairment.

Discussion: Mild Cognitive Impairment (MCI) is used to describe a transitional state between the normal stage and the mild stage of Alzheimer's dementia, characterized by early cognitive impairment in the form of memory function decline, while daily activities remain within normal limits. Radiotherapy-induced Mild Cognitive Impairment is associated with damage to several types of nerves, resulting in anatomical and functional changes in cerebral blood vessels and glial cell populations, decreased hippocampal neurogenesis, neuronal dysfunction, and increased neuroinflammation.

Conclusion: Radiotherapy, although effective in controlling the growth of metastatic tumors, can cause structural changes in brain tissue that can affect learning, memory, and information processing.

Keywords: Whole brain radiotherapy, Mild Cognitive Impairment, Brain Tumor

THERAPEUTIC POTENTIAL OF LOW-FREQUENCY CEREBELLAR REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION IN MEDICATION-REFRACTORY ESSENTIAL TREMOR: A CASE REPORT

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Introduction: Essential tremor (ET) is a common neurological disorder characterized by bilateral postural and kinetic tremor, most commonly affecting the upper limbs. Its prevalence ranges from 0.4-5% and increases with age. While pharmacological therapies remain first-line treatment, a substantial subset of patients remains refractory. Repetitive Transcranial Magnetic Stimulation (rTMS) is a non-invasive neuromodulation technique that uses magnetic fields to modulate brain activity. Low-frequency cerebellar rTMS has shown promise in reducing neuronal excitability and alleviating tremor in early studies.

Case Description: A 58-year-old woman presented with four years of progressive tremor, initially unilateral in the left upper limb and progressing to bilateral involvement with postural and kinetic features. Previous pharmacologic treatment yielded limited clinical benefit. The patient underwent low-frequency rTMS (1 Hz, 1800 pulses/day) targeting bilateral cerebellar regions for five consecutive days. Following the ntervention, the patient showed marked improvement, with a reduction in TETRAS (The Essential Tremor Rating Assessment Scale) score from 20 to 14 and notable enhancement in Archimedean spiral drawing quality. No adverse events were reported throughout the intervention.

Discussion: This case highlights the potential of low-frequency cerebellar rTMS as an effective and well-tolerated option for ET patients unresponsive to pharmacotherapy. rTMS modulates neuronal excitability within the cerebello-thalamo-cortical circuit, which plays a central role in ET pathophysiology. Low-frequency stimulation inhibits hyperactive neurons, particularly within the dentate nucleus, contributing to reduced tremor amplitude and improved motor coordination.

Conclusion: Low-frequency cerebellar rTMS may offer a valuable therapeutic alternative for patients with drug-resistant essential tremor. These findings support its clinical utility and highlight the need for larger, controlled studies to validate its efficacy and optimize stimulation protocols.

Keywords: cerebellum, Essential tremor, low-frequency repetitive transcranial magnetic stimulation

NEURORESTORATIVE RECOVERY IN A VISUAL DISCONNECTION SYNDROME

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Introduction: Alexia without agraphia, or pure alexia, is a rare disconnection syndrome typically caused by a lesion involving the dominant occipital cortex and splenium of the corpus callosum. It results in the loss of reading ability while preserving writing and visual object recognition. This case highlights the potential of neurorestorative rehabilitation and family involvement in functional recovery.

Case Description: A 68-year-old male presented with acute right-sided limb weakness, communication difficulties, forgetfulness, and right homonymous hemianopsia. He was unable to read but retained the ability to write with verbal prompts. His medical history included poorly controlled diabetes mellitus, hypertension, dyslipidemia, and hyperuricemia. Head CT imaging revealed acute infarction in the left occipital lobe and basal ganglia, with an old infarct in the left thalamus. Perimetry confirmed right homonymous hemianopsia. MoCA-INA score was 6 with impaired domains are visuospatial, executive, naming, memory, attention, language, ion, delayed recall, and orientation. He was treated with antiplatelet agents, antihypertensives, antidiabetics, statins, donepezil, and folic acid. Neurorehabilitation started from letter-by-letter reading until the multiple oral re-reading technique. With consistent practice and strong family support, he could read simple words with comprehension at discharge. After three months, he was able to read full sentences meaningfully.

Discussion: This case illustrates the importance of targeted reading rehabilitation techniques engaging spared cortical regions and promoting neuroplasticity. These findings support the presence of an alternative occipital reading route that bypasses the visual word form area. Family involvement proved critical in facilitating consistent practice and emotional support, leading to functional recovery. Continuous reading practice, alongside committed family support, is essential to improving the quality of life in stroke survivors during hospitalization and rehabilitation.

Conclusion: Neurorestoration in pure alexia can be enhanced by structured rehabilitation and family-assisted interventions. This case underlines the value of personalized therapy in stroke recovery.

Keywords: Alexia, Stroke, Multiple Oral Re-reading, Neurorestoration

EFFICACY OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION FOR TINNITUS: A CASE SERIES ACROSS HETEROGENEOUS UNDERLYING

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Introduction: Tinnitus, the perception of sound without an external source, is often associated with vestibular symptoms like dizziness or vertigo, indicating multisystem involvement. It can stem from peripheral or central causes. Transcranial Magnetic Stimulation (TMS), a non-invasive neuromodulation method, shows promise in treating tinnitus, especially in cases with neurological or vestibular comorbidities.

Case Presentation: This report presents three tinnitus cases with vestibular comorbidities and hearing loss treated with five TMS sessions. The first followed sudden sensorineural hearing loss with vertigo, the second involved post-traumatic tinnitus with vertigo and mood issues, and the third had sensorineural hearing loss. All three patients showed a significant reduction in Tinnitus Handicap Inventory (THI) scores, Tinnitus Functional Index (TFI) and Visual Analog Scale (VAS).

Discussion: Tinnitus is frequently associated with vestibular dysfunction, which may intensify symptom severity through sensory disintegration and emotional distress. The TMS has been proposed to attenuate tinnitus by reducing hyperactivity in the auditory cortex and modulating limbic system activity. In this case series, all three patients demonstrated clinically meaningful improvements, as evidenced by a ≥7-point reduction in THI scores—a threshold commonly regarded as indicative of therapeutic benefit. Further improvements were corroborated by reductions in TFI and VAS scores.

Conclusion:
These findings support the use of TMS as a safe and effective adjunctive therapy for tinnitus with vestibular comorbidities. The consistent reduction across multiple assessment scores in all patients indicates clinically relevant improvement.

Keywords: tinnitus, vestibular disorders, transcranial magnetic stimulation, hearing loss, neuromodulasi

TWO CASES OF MUSCLE CHANNELOPATHY: CLINICAL AND ELECTROPHYSIOLOGICAL INSIGHTS

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Introduction: Muscle stiffness after movement can result from various etiologies. Differentiating types of muscle channelopathies is essential for accurate diagnosis and management. We present two contrasting cases to highlight the clinical and electrophysiological differences between myotonia congenita and paramyotonia congenita.

Case Descriptions: Case 1: A 34-year-old woman reported lifelong muscle stiffness involving the face and limbs, exacerbated by cold, exertion, and prolonged posture, and alleviated by repeated movement or warmth. Examination showed eyelid and grip myotonia with normal strength. EMG revealed spontaneous myotonic discharges. The Short Exercise Test (SET) demonstrated paradoxical worsening with delayed recovery. Hand cooling resulted in a CMAP amplitude reduction. Genetic testing identified an SCN4A mutation (c.3938C>T; p.Thr1313Met), confirming paramyotonia congenita. Case 2: A 51-year-old woman initially presented with nocturnal hand numbness and pain. EMG, performed for suspected entrapment neuropathy, unexpectedly demonstrated myotonic discharges. Further history revealed childhood-onset muscle stiffness improving with repeated movement and unaffected by cold exposure. SET showed no paradoxical worsening, and hand cooling had no effect on CMAP. Genetic testing identified an SCN4A variant (c.3928A>G; p.Ile1310Val), supporting sodium channel myotonia (atypical). Repetitive Nerve Stimulation (3 Hz) was normal in both cases. Laboratory tests including CK, electrolytes, and thyroid function were also normal.

Discussion: The Short Exercise Test is pivotal in differentiating myotonia congenita, characterized by rapid recovery, from paramyotonia congenita, marked by post-exercise decrement and delayed recovery. Genetic

analysis complements clinical and electrophysiological findings for definitive diagnosis.

Conclusion: Electrophysiological studies, particularly SET, combined with clinical correlation and genetic testing, are essential for distinguishing muscle channelopathies and guiding targeted management.

Keywords: Myotonia, Paramyotonia, Short Exercise Test, Muscle Channelopathy

QUANTITATIVE ELECTROENCEPHALOGRAPHY FINDINGS IN PATIENTS WITH SYNCOPE: A CASE SERIES

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Introduction: Syncope is defined as a transient loss of consciousness (TLoC) caused by a temporary reduction in cerebral blood flow, typically associated with postural collapse and rapid spontaneous recovery. This TLoC can sometimes be difficult to differentiate from episodes of TLoC caused by epileptic seizures, particularly with the currently available diagnostic modalities. This case series aims to identify abnormalities in quantitative electroencephalography (QEEG) among patients who experienced TLoC due to syncope.

Case Description: We report a series of seven patients diagnosed with TLoC attributed to syncope. The patients ranged in age from 19 to 76 years, comprising four females and three males. All patients presented to the emergency department with sudden loss of consciousness, without accompanying neurological symptoms. Neurological examinations revealed no focal deficits, and ancillary investigations showed no evidence of systemic disease or structural brain abnormalities. Conventional EEG recordings revealed no epileptiform or other abnormal waveforms. However, QEEG analysis demonstrated asymmetrical increases in delta activity in the frontal lobes in five patients and global delta activity in one patient.

Discussion: Previous studies have highlighted the role of the frontal lobes in autonomic regulation. Impaired frontal lobe function may disrupt this regulatory process. Such alterations in autonomic control may play a critical role in the pathophysiology of syncope. This case series demonstrated focal slowing in the frontal lobes of most syncope patients, supporting the hypothesis that dysfunction in these regions may contribute to autonomic instability and increase the risk of syncope in the presence of a precipitating factor.

Conclusion: QEEG findings in this case series revealed asymmetrical increases in frontal delta activity in patients with syncope. This pattern of abnormality may serve as a potential neurophysiological marker to help differentiate syncope from seizure-related transient LoC. Further studies are needed to validate these findings and explore their diagnostic utility.

Keywords: biomarker, quantitative eeg, syncope, transient loss of consciousness

VISUAL EVOKED POTENTIAL FINDINGS IN PATIENTS WITH OPTIC NEURITIS AS A MANIFESTATION OF CLINICALLY ISOLATED SYNDROME

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Background: Clinically Isolated Syndrome (CIS), the first manifestation of central nervous system demyelination, carries a risk of progression to multiple sclerosis (MS). Optic neuritis, an inflammatory optic nerve disorder causing visual impairment, is a common early symptom of CIS. Visual Evoked Potential (VEP), a non-invasive electrophysiological method, demonstrates high sensitivity in detecting visual pathway conduction abnormalities, even before clinical or radiological signs emerge.

Case Description: A 41-year-old Balinese woman presented with a three-month history of blurred vision, predominantly in the right eye. Funduscopy revealed bilateral papilledema with flame-shaped hemorrhages. Initial visual acuity was severely reduced in the right eye (1/60) but normalized to 6/6 upon reevaluation. Brain MRI demonstrated bilateral optic neuritis and typical MS demyelinating lesions. VEP examination showed prolonged P100 wave latency upon right-eye and binocular stimulation, while left-eye latency remained normal. These findings supported a prechiasmal right visual pathway lesion.

Discussion: In CIS, prolonged P100 latency on VEP not only serves as a neurophysiological marker of optic nerve demyelination but also, through binocular cross-talk analysis, reveals the systemic impact of unilateral lesions on central visual processing. This cross-talk mechanism reflects cortical integration of binocular inputs in striate and extrastriate areas, where unilateral afferent conduction delays may modulate bilateral combined responses. VEP's diagnostic value lies in its ability to provide objective functional evidence that synergizes with structural MRI findings, enabling a comprehensive approach.

Conclusion: VEP plays a critical role in detecting visual conduction deficits and supporting CIS diagnosis in patients with early optic neuritis symptoms. Early VEP detection may facilitate timely management and monitoring of progression to MS.

Keywords: Visual Evoked Potential, Clinical Isolated Syndrome, Multiple Sclerosis

OBSTRUCTIVE SLEEP APNEA: A NEGLECTED MODIFIABLE RISK FACTOR IN STROKE PATIENTS – A CASE SERIES

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Background: Stroke remains a leading cause of disability and death worldwide. Among its modifiable risk factors, Obstructive Sleep Apnea (OSA) is common yet frequently underdiagnosed. Characterized by intermittent upper airway obstruction during sleep, OSA triggers hypoxia, sympathetic activation, and systemic inflammation, contributing to vascular damage and impaired neurological recovery. Despite its prevalence, OSA is often overlooked in stroke care. This case review aims to raise neurologists' awareness of OSA as a potential independent and treatable risk factor, particularly in preventing stroke recurrence.

Case Description: We report four first-ever ischemic stroke patients diagnosed with OSA via polysomnography, identified from medical records at Hermina Hospital Manado. The first group included two younger patients (24-year-old male and 37-year-old female) with no conventional vascular risk factors and low STOP-BANG scores. ODI monitoring revealed a high suspicion of sleep apnea, suggesting OSA as the primary cause. The second group consisted of two older male patients (48 and 54 years old) with cardiovascular risk factors and high STOP-BANG scores, indicating a possible additive effect between OSA and comorbidities. OSA severity, based on Apnea-Hypopnea Index (AHI), ranged from mild to severe.

Discussion: These cases highlight OSA as both an independent and compounding risk factor for ischemic stroke. In patients without other risk factors, OSA may directly cause stroke through hypoxia-induced vascular injury, evidenced by low oxygen saturation (<90%) in two cases. When combined with comorbidities, OSA may exacerbate vascular damage synergistically. These findings support routine OSA screening in all stroke patients, regardless of age or risk profile.

Conclusion: OSA is a modifiable and often overlooked contributor to stroke. Using screening tools like STOP-BANG, ODI monitoring, and polysomnography to diagnose OSA may enhance prevention and improve stroke outcomes.

Keywords: Obstructive Sleep Apnea, Stroke, Apnea-Hypopnea Index, Polysomnography, Modifiable Risk Factor

THERAPEUTIC CHALLENGES OF ORBITAL APEX SYNDROME IN HERPES ZOOSTER OPHTALMICUS: A CASE REPORT

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Introduction: Herpes zoster ophthalmicus (HZO), caused by varicella-zoster virus reactivation of in the trigeminal nerve's ophthalmic division, commonly affects the ocular surface. However, orbital apex syndrome (OAS) represents a rare and vision-threatening complication with limited reports, especially from Southeast Asia. This case stands out due to its atypical presentation, diagnostic complexity, and good therapy response, making it valuable reference for clinicians facing similar neuro-ophthalmologic emergencies.

Case Summary: A 64-year-old woman presented with a 25-day history of progressively worsening right ptosis, binocular diplopia, and severe right periorbital pain. These symptoms were preceded by vesicular eruptions in the right V1 dermatome, consistent with HZO. The examinations revealed complete right ophthalmoplegia (cranial nerves III, IV, and VI); non-reactive dilated right pupil (parasympathetic involvement); decreased right visual acuity (1/300); and right supraorbital hypoesthesia. These findings fulfilled OAS criteria, characterized by concurrent optic nerve dysfunction and multiple cranial neuropathies at the orbital apex. MRI demonstrated right-sided orbital myositis, optic nerve, orbital apex, and adjacent cavernous sinus enhancement. The patient received oral acyclovir (800 mg five times daily) combined with tapering-dose corticosteroids, resulting in partial resolution of ophthalmoplegia and pain relief within four weeks.

Discussion: OAS may lead to severe visual and neurologic deficits, therefore always suspect OAS in HZO patients with combined vision loss and ophthalmoplegia. Pathogenesis involves direct invasion of varicella zooster virus and secondary autoimmune response. MRI with contrast is critical to identify orbital inflammation and nerve enhancement. Early combination of antiviral and corticosteroid can preserve vision and occular function, as diagnosis or treatment delay can lead to irreversible vision loss.

Conclusion: OAS is a rare-severe complication of HZO. Prompt recognition and treatment are vital to prevent permanent vision loss. This case contributes valuable regional data and highlights the need for treatment strategies tailored to resource availability in Southeast Asia.

Keywords: Complete ophtalmoplegia, Herpes zooster ophtalmicus, Orbital apex syndrome

PEERING AT THE TIP OF THE NOSE: A DISTINCTIVE OCULAR SIGN OF THALAMIC HEMORRHAGE – A CASE REPORT

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Introduction: Thalamic hemorrhages can present with distinctive neuro-ophthalmologic signs that assist in early localization and diagnosis. One such under-recognized yet striking sign is the downward and inward deviation of the eyes, giving the appearance of "peering at the tip of the nose." This finding may indicate involvement of specific midbrain and thalamic structures responsible for vertical gaze control.

Case Description: A 63-year-old woman presented with sudden-onset left-sided weakness and numbness. She also reported a sudden, moderate-to-severe throbbing headache on the right side of her head, persistent and unrelieved by rest. Her medical history included uncontrolled hypertension. Neurological examination revealed tonic downward deviation of both eyes and esodeviation of the right eye. Vertical gaze was limited above the midline, with mild bilateral abduction limitation. Upper eyelid retraction in primary gaze was observed. This distinctive ocular posture created a "peering at the tip of the nose" appearance, raising suspicion of a thalamic hemorrhage.

Discussion: The ocular abnormalities observed suggest disruption at the mesodiencephalic junction, which encompasses neural pathways critical for vertical gaze and vergence. This region may be affected in thalamic hemorrhage, leading to the characteristic eye positioning. Recognizing this unique presentation may aid clinicians in localizing brain lesions and initiating appropriate imaging and management promptly.

Conclusion: The "peering at the tip of the nose" sign serves as a valuable clinical clue in diagnosing thalamic hemorrhage. Awareness of this distinct ocular manifestation can facilitate early neuroanatomical localization, especially in acute stroke settings, and may improve diagnostic accuracy and patient outcomes.

Keywords: Thalamic hemorrhage, vertical gaze palsy, mesodiencephalic junction

CONTRASTING ENDOVASCULAR STRATEGIES FOR DACA ANEURYSMS: A TWO-CASE ANALYSIS AND PRACTICE IMPLICATIONS FOR NEUROLOGISTS

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Background: Distal anterior cerebral artery (DACA) aneurysms are rare and uniquely challenging, display diverse morphologies that impact vascular interventional strategy despite similar hemorrhagic clinical presentations. Timely recognition of this variability is essential for clinical neurologists. This report contrasts two ruptured DACA aneurysms with significantly different morphologies.

Case Description: Case 1 involved a previously healthy 43-year-old woman who presented with sudden decreased consciousness preceded by a severe headache. Neurologic examination revealed motor aphasia and right-sided hemiparesis. Non-contrast head CT showed intracerebral hemorrhage (ICH) in the bilateral frontal lobe and intraventricular hemorrhage (IVH). Head CT angiography (CTA) and cerebral digital subtraction angiography (DSA) identified a ruptured saccular DACA aneurysm located at the bifurcation of an azygos A2 (type II variant). The aneurysm was successfully treated by simple coiling with good clinical recovery. Case 2—A 53-year-old man with hypertension, atrial fibrillation (AF), and prior ischemic stroke presented in status epilepticus following episodes of syncope. Imaging revealed extensive interhemispheric subarachnoid hemorrhage (SAH), bilateral frontal ICH, and IVH. Head CTA identified a complex bilobed dissecting aneurysm in the ACA (A2–A3 segment); and cerebral DSA identified an additional fusiform aneurysm in the ACA (A1 segment). Given the complex angioarchitecture, stent-assisted coiling was performed, achieving half-complete aneurysm packing while maintaining parent vessel patency.

Conclusion: These cases underscore that neurologists should suspect a ruptured DACA aneurysm when encountering interhemispheric hemorrhage patterns. Recognizing differences between saccular and dissecting aneurysms is critical, as dissecting aneurysms frequently occur as multiples and require more complex endovascular strategies.

Keywords: azygos ACA, distal anterior cerebral artery, ruptured aneurysm, simple coiling, stent-assisted coiling

PREOPERATIVE EMBOLIZATION OF MENINGIOMAS WITH MULTIMODAL AGENTS: A TWO-CASE REPORT USING NBCA, SQUID, AND PVA FOR OPTIMIZED SURGICAL PLANNING

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Background: Meningiomas are common intracranial tumors often characterized by rich vascularity, posing challenges during surgical

resection due to significant intraoperative bleeding. Preoperative embolization has emerged as a crucial technique to reduce tumor vascularity, thereby facilitating safer and more effective surgery.

Case Description: This report details two cases of meningioma managed with different embolic agents tailored to their vascular anatomy and clinical presentation. The first case involved a combination of glue (NBCA-Lipiodol) and polyvinyl alcohol particles to embolize complex feeders arising from right middle meningeal artery, meningo-lacrimal artery and accessory meningeal artery. The second case also combination of squid and glue to embolization targeting feeders from anterior choroidal artery and pericallosal Artery. Both approaches resulted in substantial tumor devascularization, enabling successful craniotomy with controlled blood loss and no reported neurological complications.

Conclusion: These cases emphasize the importance of individualized embolization strategies, appropriate timing between embolization and surgery, and multidisciplinary collaboration to optimize surgical outcomes in meningioma patients.

Keywords: meningioma, preoperative embolization, embolic agents, polyvinyl alcohol, surgical outcomes

COIL EMBOLIZATION OF A CAROTID CAVERNOUS FISTULA IN INTERVENTIONAL NEUROLOGY: SERIAL CASE REPORT

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Introduction: Carotid-cavernous fistula (CCF) is a pathological condition in the form of abnormal communication between the carotid artery system and the cavernous sinus, which can cause neurological or ocular symptoms. Digital subtraction angiography (DSA) is the gold standard modality for evaluating CCF. Management of CCF through an endovascular approach, especially with coil embolization techniques, is currently the main choice in interventional neurology.

Case Description: The three cases with clinical manifestations found included proptosis, chemosis, visual disturbances, orbital bruit, and cranial nerve deficits, and had a history of trauma. The diagnosis was confirmed by neurological and ophthalmic evaluation, head CT scan, cerebral MSCTA and DSA. Then coil embolization was performed and the patients experienced improvement.

Discussion: Direct CCF (Type A) often present acutely with pulsatile exophthalmus, conjunctival chemosis, cranial nerve palsies, diplopia, and visual loss due to elevated intraocular pressure and venous congestion. Endovascular embolization is the gold standard due to its high success rate and minimal invasiveness, emphasizing the importance of early intervention to prevent complications.

Conclusion: Coil embolization in CCF cases has shown good efficacy in improving clinical manifestations. However, the degree of improvement may vary depending on the type of fistula, treatment time, and initial clinical condition of the patient.

Keywords: Carotid cavernous fistula, coil embolization, digital subtraction angiography

IMPROVED CLINICAL OUTCOMES FOLLOWING ENDOVASCULAR EMBOLIZATION IN DIRECT CAROTID-CAVERNOUS FISTULA: A CASE SERIES

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Background: Direct Carotid Cavernous Fistula (CCF) is an abnormal condition about connection of the carotid artery with the cavernous sinus caused by head trauma which is a destructive cerebrovascular disease due to increased intracavernous pressure.

Case Description: Both cases showed abnormal connections between the internal carotid artery dextra and the cavernous sinus. Case 1. 34-year-old woman with complaints of exoftalmus oculi dextra. Initially the patient complained of headache with chemosis, diplopia and was found to have parese nervus abducens dextra. Case 2. A 13-year-old male with complaints of exoftalmus accompanied by loss of sharp vision in the right eye. Previously the patient complained of headache with chemosis. Physical examination revealed parese nervus opticus dextra. Cerebral Angiography examination was performed and found a direct high flow connection from the cavernous segment of the right internal carotid artery (Rt-ICA) to the cavernous sinus especially to the posterior and anterior drainage veins (through the inferior sinus petrosus/IPS, superior and inferior ophthalmic veins), with drainage to the internal jugular vein which was then subjected to endovascular coiling intervention.

Discussion: Exophthalmus and chemosis are the most common symptoms of CCF. The most common cause is head trauma resulting in abnormal connection of the carotid artery with the cavernous sinus. Both cases showed symptoms of exophthalmus, chemosis and headache that occurred after trauma, even in the second case accompanied by complaints of sharp vision loss, Cerebral Angiography examination and coiling intervention management should be done as soon as possible to provide good clinical outcomes.

Conclussion: Management of coiling intervention in CCF is the primary therapy to obtain a good clinical outcome, Most CCFs are not life-threatening, immediate treatment is required to prevent permanent injury to the affected eye.

Keywords: Carotid Cavernous Fistula, Cerebral Angiography, coiling

CAROTID ARTERY STENTING IN NEAR OCCLUSIVE INTERNAL CAROTID ARTERY DISSECTION

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Introduction: Internal carotid artery dissection (CAD) is narrowing or blockage of internal carotid artery due to presence of intramural hematoma within arterial smooth muscle. Carotid artery stenting (CAS) has been proven to be safe and effective as secondary prevention of stroke due to CAD.

Case Description: A 44 years old woman presented with headache since five days before admitted to hospital also with severe non radiating jaw pain. Physical examination showed high blood pressure with high numeric pain rating scale. Neurologic examination showed ptosis and myosis on left eyes suggesting for Partial Horner syndrome with left hypoglossal nerve palsy. Digital substraction angiography showed 90% of narrowing in left internal carotid artery. Patient underwent CAS after seven days of dual antiplatelet and continue until ninety days after procedure. Follow-up after procedure showed symptom relieved.

Discussion: CAS on CAD within fourteen days of onset should be considered as prevention for stroke among patients with symptomatic stenosis.

Conclusion: Further study and case selection needed on CAS procedure due to near occlusive CAD.

Keywords: carotid, dissection, stenting

IMMUNED INDUCED CEREBRAL EDEMA: A CASE REPORT OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN WOMAN WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Introduction: Posterior Reversible Encephalopathy Syndrome (PRES) is a clinical-radiological condition characterized by altered mental status,

seizure, headache, visual disturbances, and vasogenic edema in posterior brain region. Systemic lupus erythematosus (SLE) is one of the autoimmune conditions that associated with PRES, with a reported prevalence approximately 0.43%. Although rare, early recognition is critical to prevent significant the morbidity and mortality.

Case Description: A 25-year-old woman with a history of SLE and stage 5 lupus nephritis on routine haemodialysis came to the emergency department with sudden loss of vision. She also had generalized tonic-clonic seizures up to 9 episodes/day and severe headache. Patient was compos mentis and her blood pressure was 214/136 mmHg. Her neurological examination showed preserved motor and sensory function, but visual acuity was 1/~ in both eyes. Laboratory results showed low eGFR (7), elevated urea (108 mg/dL and creatinine (7.1 mg/dL). Non contrast head CT-scan showed bilateral occipital hypodensities suggestive vasogenic edema. She was treated with antihypertensive, anti-epileptic, and immunosuppressants drug. Haemodialysis was continued and her vision was gradually improved within ten days of hospitalization. A follow up brain MRI performed seven months later showed complete resolution of occipital lesions.

Discussion: This case illustrated the clinical presentation of PRES, manifesting as cortical blindness and seizures in patient with history of lupus. Pathophysiological mechanism involving endothelial dysfunction, immune-mediated inflammation, and disruption of cerebral autoregulation. In patient with SLE, these mechanisms are exacerbated by hypertension, renal impairment, and immunosuppressive therapy. The early neuroimaging findings, supported by clinical presentation improved early diagnosis and critical in differentiating PRES from other acute neurological condition such as stroke and give effective therapeutic.

Conclusion: PRES should be considered in lupus patients presenting with acute vision loss or other neurological symptom. Prompt treatment and diagnosis are essential to fully recovery and prevent permanent neurological deficits.

Keywords: PRES, SLE, Autoimmune, Cortical blindness, Hypertension, Seizure

ANTI–SIGNAL RECOGNITION PARTICLE ANTIBODY POSITIVE IMMUNE-MEDIATED NECROTIZING MYOPATHY: A CASE REPORT

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Introduction: Immune-mediated necrotizing myopathy is a rare subtype of idiopathic inflammatory myopathies, characterized by acute or subacute onset of symmetrical proximal muscle weakness, markedly elevated serum creatine kinase, and minimal inflammatory infiltrates on histopathology. The presence of anti–signal recognition particle antibodies is associated with a more severe disease phenotype and poor therapeutic response.

Case Description: A 38-year-old woman presented with a six-month history of progressive symmetrical limb weakness, initially affecting the proximal lower extremities, followed by upper limbs. Two weeks prior to admission, she developed dyspnea and a productive cough. Neurological examination revealed symmetric proximal tetraparesis without sensory deficits or cranial nerve involvement. Laboratory tests showed leukocytosis and elevated creatine kinase (3843 U/L). Electromyography indicated a myopathic pattern, and serologic testing was positive for anti–signal recognition particle antibodies. Chest radiography revealed right-sided pleural effusion. A diagnosis of anti–signal recognition particle antibody-associated immune-mediated necrotizing myopathy was made, complicated by community-acquired pneumonia. The patient received high-dose intravenous methylprednisolone, followed by oral corticosteroids and azathioprine, along with chest physiotherapy and rehabilitation. Partial clinical improvement was noted during hospitalization. Given the suboptimal response to initial immunosuppressive therapy, rituximab is planned as second-line of therapy.

Discussion: Anti–signal recognition particle positive necrotizing myopathy is frequently associated with rapid progression, respiratory compromise, and resistance to conventional therapy. Diagnosis relies on clinical, laboratory, and electrophysiological findings, particularly in settings where muscle biopsy is not feasible. Immunosuppressive therapy remains the mainstay of treatment.

Conclusion: This case underscores the importance of early identification and prompt initiation of immunosuppressive therapy in anti–signal recognition particle antibody-associated necrotizing myopathy. Multidisciplinary management is essential to improve functional outcomes and reduce long-term disability.

Keywords: Immune-Mediated Necrotizing Myopathy, Signal Recognition Particle Antibody, Tetraparesis, Inflammatory Myopathy

VALACYCLOVIR NEUROTOXICITY IN HEMODIALYSIS PATIENT: CASE REPORT

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Background: Valacyclovir, a prodrug of acyclovir, is a widely prescribed antiviral medication known for its efficacy in treating herpes infections. Despite its good safety profile, it can cause systemic adverse effects, such as neurotoxicity, which are less frequent and known. Given that valacyclovir's pharmacokinetics are significantly altered in individuals with renal impairment - characterized by reduced clearance and prolonged half-life - the risk of drug accumulation and subsequent neurological complications is heightened in this population.

Case Presentation: We present two cases of middle-aged patients with history of chronic kidney disease on routine hemodialysis. Both patients were prescribed valacyclovir for acute herpes zoster infection. They presented to the emergency department due to disturbance of consciousness and visual hallucinations after taking valacyclovir. One patient showed agitation; the other patient was somnolent. Dysarthria was observed in one patient and brain MRI showed no significant abnormalities. Patients were monitored throughout hospitalization with cessation of valacyclovir and continuation of routine hemodialysis. Consciousness returned to normal baseline in both patients.

Discussion: Valacyclovir has selective action in infected cells with minimal effect on host cells, leading to fewer side effects. The precise mechanism underlying valacyclovir-induced neurotoxicity remains unclear. The rare adverse effect of neurotoxicity induced by valacyclovir can occur mainly in patients with advanced age and impaired renal function. The most characteristic symptoms are confusion, altered level of consciousness, hallucinations, agitation, and dysarthria. The basis of treatment is the discontinuation of valacyclovir and maybe additional clearance by dialysis.

Conclusions: Valacyclovir neurotoxicity should be considered as one of differential diagnosis for herpes zoster patients presenting with disturbance of consciousness. Dialysis will replace some of the excretory functions of the kidneys, but is still not equivalent to fully functioning kidneys. These cases highlight the importance of valacyclovir dose adjustment for patients on routine hemodialysis. in order to prevent neurotoxicity.

Keywords: Valacyclovir - Neurotoxicity – Chronic kidney disease – Hemodialysis

PAINFUL LEG AND MOVING TOES SYNDROME: A RARE CASE REPORT

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Introduction: Painful legs and moving toes (PLMT) is a a rare clinical syndrome characterized by deep, aching and pulling pain in the segmental lower limb along with spontaneous erratic and purposeless toe movements. Both central and peripheral nervous system diseases have been associated with it leading to different physiopathological mechanisms.

Case Description: A 56-year-old female was referred to neurology department caused of involuntary movement accompanied by pain in her right toes. The symptoms had been present for 1 year. Pain and movements were disappeared during sleep. Patient had history of diabetes mellitus since 5 years ago. Physical examination revealed slow involuntary irregularly movements (flexion and extension). In addition, nerve conduction study findings were not significant. The patient was diagnosed with painful legs and moving toes (PLMT) syndrome and treated

with gabapentin and clonazepam. This patient showed mild response to this therapy.

Discussion: Painful Legs and Moving Toes syndrome (PLMT) is a rare movement disorder with involuntary irregular flexion/extension of one or more toes, which is often accompanied with pain felt deeply in the foot and leg. PLMT syndrome in this patient attributed to peripheral neuropathy (28%), trauma (11%), radiculopathy (9%) or idiopathy (42%), and parkinson. Response to treatment of PLMT syndrome is unsatisfactory in majority of the patients. Until now, there have been no guidelines for the management of PLMT, due to the poor understanding of its etiology and pathogenesis. Frequent ectopic impulses to the posterior root, which are spontaneously produced at the injured peripheral nerve could lead to pain and involuntary movements via the abnormal re-networking of local spinal circuits.

Conclusion: Painful legs and moving toes (PLMT) is a condition that affects the quality of life of patients, but the exact cause of this condition is unclear. Spontaneous resolution is uncommon, and oral pharmacotherapy is the first line treatment.

Keywords: Painful legs and moving toes syndrome; PLMT, Movement Disorder

THE EFFECTIVENESS OF CERVICAL INTERLAMINAR EPIDURAL STEROID INJECTION IN THE MANAGEMENT OF CERVICAL CANAL STENOSIS: A CASE SERIES

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Introduction: Cervical canal stenosis is a degenerative disorder involving spinal canal narrowing that can compress the spinal cord or nerve roots, leading to pain and neurological deficits. Cervical Interlaminar Epidural Steroid Injection (CIESI) is a conservative treatment aimed at reducing inflammation and neuropathic pain.

Case Report: This series presents two patients with cervical canal stenosis. The first, a 44-year-old man, experienced neck pain radiating to the left arm, burning sensation, paresthesia, lower limb weakness, and numbness. MRI revealed severe stenosis at C4–5 and C5–6. The second, a 62-year-old woman, presented with limb weakness, paresthesia, neck pain, imbalance, and impaired fine motor skills. MRI showed disc bulging from C4–C7 with cord compression and moderate stenosis. Both underwent CIESI and showed significant improvement in symptoms without adverse effects.

Discussion: Cervical canal stenosis can cause a range of symptoms from localized pain to progressive neurological dysfunction. Accurate diagnosis relies on thorough clinical and radiological assessment. CIESI is a minimally invasive option that can alleviate symptoms in patients not yet requiring surgery. In these cases, CIESI was effective in reducing pain and neurological complaints, supporting its role in early-stage management.

Conclusion: CIESI is an effective conservative therapy for managing symptoms of cervical canal stenosis, particularly in patients unsuitable for surgery. It offers pain relief and functional improvement with minimal risk. Continued clinical monitoring and long-term follow-up are essential to guide treatment planning and prevent progression.

Keywords: Cervical canal stenosis, Cervical Interlaminar Epidural Steroid Injection, Pain intervention

DIABETIC CRANIAL MONONEUROPATHY, PUPIL SPARING AS A DISTINGUISHING FEATURE

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Introduction: Diabetic Neuropathy (DN) is a complication of uncontrolled Diabetes Mellitus (DM). One of the subtypes of DN is diabetic cranial mononeuropathy, with the oculomotor nerve being the most frequently affected cranial nerve, followed by the trochlear and abducens nerves, resulting in the condition known as diabetic ophthalmoplegia. This condition is rare, with an incidence of approximately 0.32-1% of total DM cases. The ability to differentiate ophthalmoplegia caused by diabetes from that due to other causes is important for planning appropriate diagnostic and management strategies.

Case Report: A 65-year-old male presented with sudden binocular diplopia, right eyelid ptosis, and right-sided headache. The patient had a history of uncontrolled DM. From the physical examination, we found paresis of right cranial nerves III, IV, and VI, with the pupillary light reflex still intact (pupil sparing), and no other neurological deficit. Supporting examination showed a random blood glucose level of 445 mg/dL, without compression or vascular lesion on neuroimaging (MRI, MRA, and DSA). The patient was managed with symptomatic treatment (paracetamol and gabapentin) alongside glycemic control with insulin.

Discussion: This case report illustrates the condition of ophthalmoplegia with pupil sparing in a patient with uncontrolled DM. Our reference said that the condition of cranial nerve III paresis with pupil sparing, age over 50 years old, with vascular risk factors such as DM, and exclusion of other etiology through imaging, support the diagnosis of diabetic ophthalmoplegia. The management is generally conservative (watchful waiting), with symptomatic treatment and glycemic control. This condition is usually self-remitted in 1-3 months.

Conclusion: This case report highlights the findings of ophthalmoplegia with the distinguishing feature of intact pupillary light reflex (pupil sparing) and a history of DM, which should raise suspicion of diabetic cranial mononeuropathy as one of the differential diagnoses.

CLASSICAL TRIGEMINAL NEURALGIA TREATED BY GASSERIAN BLOCK USING HYPEROSMOLAR 20% DEXTROSE WATER INJECTION

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Introduction: Classical trigeminal neuralgia (CTN) is a chronic neuropathic pain disorder characterized by sudden, severe, electric shock-like facial pain. While pharmacologic therapies are first-line treatments, some patients experience inadequate relief or adverse effects, necessitating alternative interventions.

Case: A patient presented with recurrent, paroxysmal facial pain localized to the V2 and V3 branches of the trigeminal nerve, consistent with CTN. MRI with contrast revealed vascular compression at the trigeminal root entry zone. Given the suboptimal response to medication, a fluoroscopy-guided Gasserian ganglion block was performed using 20% dextrose water (D20W), a hyperosmolar solution.

Discussion: Experimental studies have demonstrated that solutions with osmolality greater than 1000 mOsm/L can be neurolytic, causing separation of the myelin lamellae in myelinated nerve fibers and total destruction in unmyelinated fibers after prolonged exposure. Pharmacologic properties of hypertonic dextrose are both neurolytic and inflammatory, which can be beneficial in certain clinical scenarios. In this case, the use of D20W, with an osmolality exceeding 1000 mOsm/L, aimed to achieve a controlled neurolytic effect on the Gasserian ganglion to alleviate pain. The procedure was well-tolerated, and the patient reported substantial pain relief with improved quality of life post-intervention. This case represents a novel application of D20W in a fluoroscopy-guided Gasserian ganglion block for CTN, highlighting its potential as a safe and effective alternative to traditional neurolytic agents.

Conclusion: Fluoroscopy-guided Gasserian ganglion block with 20% dextrose water may offer a promising, safe, and effective treatment for patients with refractory classical trigeminal neuralgia. Further clinical

studies are warranted to validate its long-term efficacy and elucidate the underlying mechanisms.

Keywords: Classical trigeminal neuralgia, Gasserian ganglion block, 20% dextrose injection, hyperosmolar therapy, neurolysis, facial pain intervention

HEMICONVULSION HEMIPLEGIA EPILEPSY SYNDROME: A RARE CASE REPORT

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Introduction: Hemiconvulsion-Hemiplegia-Epilepsy (HHE) syndrome is a rare neurological condition predominantly seen in infancy or early childhood, typically triggered by prolonged unilateral febrile seizures. It progresses to cerebral hemispheric atrophy, resulting in hemiplegia and chronic epilepsy. Epidemiological data are limited, but a retrospective study in Niger reported a 2.5% prevalence among pediatric epilepsy cases.

Case Report: A previously healthy 6-year-old girl experienced prolonged left-sided focal seizures following a febrile episode in January 2024, lasting up to 24 hours, followed by persistent left hemiparesis. A second, shorter seizure (<10 minutes) occurred in June 2024. EEG showed asymmetric background activity: moderate-to-high amplitude over the left hemisphere, lower amplitude over the right, and a more prominent posterior dominant rhythm (8–9 Hz) on the left. Intermittent theta activity (6–7 Hz) and epileptiform discharges were observed in the right parietal region. Non-contrast cranial CT demonstrated right-sided frontotemporoparietal subdural hygroma and cerebral atrophy. The patient was diagnosed with HHE syndrome and started on valproic acid (2x4 mL daily), with referrals for neurosurgical and rehabilitative evaluation.

Discussion: HHE syndrome typically presents in childhood and is defined by a triad of prolonged unilateral seizures, hemiplegia, and subsequent partial epilepsy. The syndrome can be classified as idiopathic or symptomatic. In this case, the presentation fits the idiopathic type, likely triggered by prolonged febrile seizures lasting more than 24 hours. Although the exact cause remains unclear, possible underlying mechanisms include genetic predisposition and focal epileptogenic lesions.

Conclusion: This case aligns with the ILAE definition of HHE syndrome, which requires both acute and chronic phases. There are no established guidelines regarding long-term anticonvulsant therapy for HHE. This patient is currently being treated with valproic acid, and no recurrent seizures have occurred so far.

Keywords: Hemiconvulsion-Hemiplegia-Epilepsy syndrome, HHE, unilateral seizure, hemiplegia, focal epilepsy, status epilepticus, pediatric, cerebral atrophy

RECURRENT TRIGEMINAL NEURALGIA AFTER SURGICAL INTERVENTION: CHALLENGES IN MANAGING POST-MVD AND GANGLION ABLATION FAILURE

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Introduction: Trigeminal neuralgia is a neurological disorder marked by recurrent, severe, electric shock–like facial pain. The primary etiology is vascular compression of the trigeminal nerve. Microvascular decompression (MVD) is the standard definitive treatment, with a success rate of 70–90%. In this case report, we present a failure of MVD.

Case Presntation: A 58-year-old woman presented with chronic, intense pain on the left side of her face, particularly in the cheek and jaw, described as burning, stabbing, and electric-like in nature. She had previously undergone one MVD and one trigeminal ganglion ablation, but symptoms persisted despite adequate medication. MRI Brain Contrast revealed vascular contact between superior cerebellar artery and trigeminal nerve. On physical examination, NPS score was 10 and ID Pain score 3 (allodynia, burning, electric shock), Cranial nerve assessment showed paresthesia in the maxillary (V2) and mandibular (V3). A second MVD was performed, and she has pharmacologic therapy with carbamazepine 300 mg three times daily, pregabalin 75 mg once daily, and morphine 10 mg twice daily.

Discussion: MVD uses a PTFE (polytetrafluoroethylene) to separate the offending artery from the trigeminal nerve. However, pulsatile micro-movement of the artery can shift the PTFE, leading to recurrent nerve compression. Additionally, radiofrequency ablation performed after surgery may fail due to adhesions and chronic pain, which promote central sensitization and prevent complete pain relief.

Conclusion: The recurrent of trigeminal neuralgia after MVD and ganglion ablation need multimodal treatment strategy including repeat imaging, combination pharmacotherapy, and consideration of non-surgical options like radiosurgery or neuromodulation.

Keywords: Neuralgia Trigeminal, MVD Failure, Theraphy

THE DILEMMA OF A TRADITIONAL DIVING FISHERMAN: DECOMPRESSION SICKNESS AS A POSSIBLE CONTRIBUTING FACTOR FOR THE DEVELOPMENT OF POST-TRAUMATIC EPILEPSY

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Introduction: Indonesia is a maritime country with many of its population working as traditional diving fishermen who use improvised equipment, such as tire repair air compressors, which do not meet safety standards. Health risks such as decompression sickness (DCS) may arise. This report presents a traditional diving fisherman diagnosed with post-traumatic epilepsy (PTE), with DCS identified as a contributing factor for the development of PTE.

Case Description: A 37-year-old male presented with recurrent unprovoked seizures classified as generalized motor tonic-clonic seizures, over the past four years. Several episodes occurred on a boat after diving. The patient also frequently reported DCS symptoms after diving that manifested in paresthesia of all four extremities, which resolved spontaneously within a few hours. He has a history of severe traumatic brain injury (TBI) that occurred six years before the onset of seizures. There was no history of seizures or developmental delay during childhood. Neurological examination revealed no deficits with normal EEG results and head MRI showed gliosis in the right frontal lobe. Seizures are currently controlled with phenytoin 100 mg three times daily.

Discussion: In this case, PTE is the suspected etiology of recurrent seizures, based on the clinical history of TBI, with a possible epileptogenic focus in the frontal region, as supported by the MRI findings. Literature indicates that the effects of TBI on PTE can persist for up to 15–20 years. The exact mechanisms of PTE remain unclear. Various factors are thought to contribute, including comorbid conditions. The patient's symptoms of DCS are strongly suspected to be a contributing factor in the development of PTE.

Conclusion: Clinical data, neurological examination, EEG, and imaging findings lead to PTE as an etiology of epilepsy, with DCS identified as a possible contributing factor for the development of PTE.

Keywords: Epilepsy, Post Traumatic Epilepsy, Decompression Sickness, Traditional Diving Fisherman

PHENOBARBITAL OVERDOSE PRESENTING WITH STATUS EPILEPTICUS: A CASE REPORT KHMER SOVIET FRIENDSHIP HOSPITAL, CAMBODIA, SEP. 2024

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Introduction: Epilepsy is a chronic disease of the brain that predisposes an individual to having recurrent unprovoked seizures. Epilepsy is typically diagnosed when an individual has two or more unprovoked seizures

separated by at least twenty-four hours. If a diagnosis of status epilepticus is made, means the ongoing seizure activity wound be carries a high risk of causing permanent damage to the brain, so at that point it's necessary to actively stop the seizure from continuing. Status epilepticus is a life-threatening neurological condition defined as five or more minutes of continuous seizure activity or repetitive seizures without regaining consciousness between episodes. On average, 20% of cases are fatal, although studies have reported mortality rates as high as 57% in adults. Most patients have a background of epilepsy; however, a number of secondary causes should be considered including stroke, infections, trauma, metabolic disorders, inflammatory conditions, CNS tumors and drug overdose. Historically, phenobarbital is one of the first antiepileptic medications used in the field since the early 1900s. Phenobarbital has a narrowed therapeutic window of 10-30 mcg/mL, while the toxic reference range is >40 mcg/mL. Adult dosage is 30-120 mg/day orally divided two or three times daily; do not exceed 400 mg/day; while pediatric is 2 mg/kg. The result of phenobarbital overdose is prominently related to cortical suppression and coma. It may seem surprising if a patient develops seizure in presence of phenobarbital overdose. Hereby, we present a patient who had attempted suicide with phenobarbital and presented to us with status epilepticus.

Case Study: A 16-year-old woman was brought to ED reported with multiple episodes of tonic-clonic seizure at home accompanied with altered mental status and shortness of breath. The duration last around 4-5 minutes per episode, about 5 times prior to hospital arrival. The mother described her daughter's seizure to be generalized and happened continuously without gaining a full consciousness. No evidence of recent trauma was present, although she did had history of head trauma at the age of 15, with past medical history of epilepsy and depressive disorder was diagnosed around a year ago at Children's Kantha Bopha hospital. By the age of 16th, the patient was referred for OPD consultation to continue her treatment at KSFH on 28/08/2024. She was given Phenobarbital 28tabs. (50mg, QID) for generalized tonic-clonic seizures, Diazepam 4tabs. (5mg, OD at night, 8days) for her insomnia, and Ferrosulfate/Folic acid 7tabs. (200/0.40mg, OD) for associated iron-deficiency anemia. On the same day at night, the mother found her to be less responsive, collapsed near to an emptied box of medicine, thereby suicidal attempt was suspected. Upon ED arrival at 20:50, the patient found be in somnolence status with mild respiratory distress. Her GCS was 11/15 (E3/V3/M5), non-dilated and symmetric reacted pupils, no vomiting, cranial nerve exams were intact, with neutral plantar reflexes. Physical examination over other body systems were unremarkable. Routine blood test was done, showing no sign of organs damage, infection, nor metabolic problems. Head computerized tomography scan without contrast injection was also done, confirmed no underlying pathological findings such as stroke nor neoplasm. With remarkable history of epilepsy, repetitive convulsion activity without gained a full consciousness, as well as excluded uninvolved pathologies; the patient was diagnosed to be Status epilepticus induced by Phenobarbital overdose. As the status epilepticus is a life-threatening condition, the patient was admitted to ICU department for continue monitoring and treat her convulsion promptly as guided through neurology specialist consultation. Four days later, the patient condition improved, then referred to neurology department to adjust the medication for more effective control over her convulsion along with some anti-depressant to manage her depressive disorder. On the next day, she had no relapsed seizure along with overall clinical improvement including her sleeping and hunger. She was discharged after five days of hospital admission with follow-up by neurologist and psychiatrics.

Discussion: There's a case report regarding Phenobarbital overdose presenting with status epilepticus, which conducted at Neurology department, Loghman-Hakim Hospital of Iran on May 16, 2016 and publish on Jun 11, 2016. Some studies have shown that molecular factors of some barbiturates may play role in their convulsive effects, as different enantiomers have opposite effects on the neuronal circuit. Because the patient consumed 28 tablets of Phenobarbital (50mg) which is equal to 1,400mg about 3.5 times higher than daily maximum dose of adult could take, thereby phenobarbital overdose is expected even toxicology for phenobarbital level is not available. Although, only a CT and no MRI brain was done, and therefore minor hypoxic ischemic injury, seizure due to respiratory compromise after phenobarbital ingestion, cannot be entirely ruled out. Thus, additional research in this field can even improve our understanding of phenobarbital-induced epilepsy.

Conclusion: Seizure aggravation can be induced by phenobarbital toxicity. Series of neurological studies such as; head CT, and EEG evaluation, confirming with toxicology screening, seems reasonable in cases of phenobarbital poisoning to detect underlying cause of seizure and manage it properly. More studies are still warranted to clarify the exact mechanism of such events.

Keywords: Phenobarbital overdose, Status epilepticus

SLEEPWALKING AND OTHER SLEEP PROBLEMS IN NEUROPSYCHIATRIC SYSTEMIC LUPUS ERYTHEMATOUS PATIENT WITH EPILEPSY

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Introduction: Neuropsychiatric systemic lupus erythematosus (NPSLE) refers to the neurological and psychiatric manifestations of SLE, including seizures, cognitive dysfunction, movement disorders, cerebrovascular disease, and polyneuropathies. Sleep disorders may result from NPSLE and can influence disease progression, psychological well-being, and exacerbate other SLE symptoms. However, sleep disturbances in SLE patients are often underrecognized and underreported.

Case Description: An 18-year-old female with a 9-year history of lupus nephritis and NPSLE (presenting as epilepsy) reported difficulty initiating sleep for the past 3 years. She also experienced episodes of sleepwalking in the middle of the night, suspected to be non-rapid eye movement (NREM) parasomnia, occurring 1–2 times weekly. The Pittsburgh Sleep Quality Index (PSQI) indicated poor sleep quality, and the Insomnia Severity Index (ISI) suggested subthreshold insomnia, particularly early insomnia. Psychological assessment using the 21 questions of Depression, Anxiety, and Stress Scale (DASS-21) showed mild depression and moderate anxiety. Initially she was treated with valproic acid, however her seizures remained uncontrolled and often occurred during sleep, leading to disturbed sleep quality. This condition worsened her mood which is also a contributing factor sleepwalking and the other sleep problems. Levetiracetam was added to her treatment, resulting in seizure control, hence improving the sleep quality and cessation of sleepwalking episodes.

Discussion: SLE disrupts the balance of cytokine levels and melatonin regulation contributing to sleep disorders. Sleep disturbances such as insomnia and parasomnias, including sleepwalking, may be triggered by epilepsy and poor nocturnal seizure control due to disrupted sleep architecture. Mood disorder such as depression is also a main contributor of sleep disorder in SLE.

Conclusion: NPSLE as epilepsy can significantly lead to various sleep problems, hence needing a proper recognition and evaluation. Effective management of both conditions, alongside psychological support, is essential for improving sleep and overall quality of life in affected patients.

Keywords: sleepwalking, insomnia, sleep problem, epilepsy, systemic lupus erythematosus, neuropsychiatric systemic lupus erythematosus

EPILEPSY IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS AND CORONARY ARTERY DISEASE: A CHALLENGE IN MANAGEMENT AND MONITORING

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Introduction: Epilepsy is a chronic neurological disorder characterized by recurrent seizures due to abnormal electrical activity in the brain. In some cases, epilepsy can emerge as a secondary manifestation of systemic lupus erythematosus (SLE), particularly when the central nervous system is involved. The management and monitoring of epilepsy with comorbidities present clinical challenges due to the risk of drug interactions, cardiovascular side effects, and complications related to immunosuppressive therapy.

Case: A 47-year-old Balinese male presented with recurrent seizures occurring more than six times within 24 hours. The seizures involved generalized tonic-clonic movements lasting approximately 2–3 minutes, followed by postictal weakness and nausea. The patient had a known history of epilepsy since 2024, moderate activity SLE, suspected neuropsychiatric SLE (NPSLE), coronary artery disease, hypertension, and asymptomatic bradycardia. Electroencephalography showed generalized epileptiform activity supporting the diagnosis of generalized epilepsy. The treatment included antiepileptic drugs (phenytoin, valproic acid, clobazam), immunosuppressants (methylprednisolone, mycophenolate sodium, hydroxychloroquine), along with supportive therapy and intensive neurological and cardiovascular monitoring.

Discussion: Epilepsy in patients with comorbid SLE and coronary artery disease is a complex condition that requires a comprehensive management approach. In this case, seizures were suspected to be associated with NPSLE. Careful selection of antiepileptic drugs, dose adjustments, and close monitoring of side effects were essential. Daily clinical monitoring, cardiac evaluation via electrocardiography, neurological assessments, and regular laboratory tests to detect electrolyte imbalances, drug toxicity, and disease activity were critical components of patient care.

Conclusion: Epilepsy in patients with complex comorbidities such as SLE and coronary artery disease requires thorough management and monitoring. Antiepileptic therapy combined with appropriate disease control and strict monitoring can prevent complications and support the patient's clinical recovery.

EPILEPTIC ENIGMA: TWO CASES OF TWIN SIBLINGS WITH SUSPECTED CLAES JENSEN SYNDROME IN X-LINKED RECESSIVE EPILEPSY

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Introduction: Epilepsy has a well-established genetic basis, with inheritance patterns including autosomal dominant, autosomal recessive, and X-linked transmission. X-linked recessive (XLR) conditions are particularly notable due to their distinct inheritance patterns and predominance in males. Claes Jensen syndrome (CJS), a rare genetic disorder characterized by intellectual disability, short stature, and epilepsy, is associated with XLR inheritance. This syndrome highlights the importance of familial pedigree evaluation in males with early-onset epilepsy.

Case Description: We report two male twin siblings, HL and HM, aged 19 years, with a history of focal to bilateral tonic-clonic seizures, developmental delay, and intellectual disability (more severe in HL). Both siblings exhibited similar clinical features, including seizure onset at age of three, delayed speech development, short stature, and spasticity in both legs. Electroencephalography finding revealed no abnormalities. Family pedigree revealed that four males out of six siblings developed epilepsy with a similar clinical course, while two female siblings were unaffected. Additionally, two uncles on their mother's side experienced sudden unexpected death in epilepsy. Genetic testing was not performed, due to lack of their family consent. Based on the clinical presentation and inheritance pattern, CJS was suspected as the most likely diagnosis.

Discussion: This report highlight the importance of clinical and familial evaluation in males with early-onset epilepsy, developmental delay, and short stature. The XLR inheritance pattern, and symptoms showed alignment with CJS. However, limited access to genetic testing remains a barrier for confirmation. The positive response to carbamazepine significantly reduced seizure frequency and improved their quality of life.

Conclusion: This report reinforces the association between CJS and XLR epilepsy. In clinical setting where genetic testing remains inaccessible, familial screening and clinical evaluation become essential for diagnosis of this syndrome. Early diagnosis could enable earlier therapeutic intervention, potentially improving long-term outcomes through optimized treatment strategies.

Keywords: Genetic Epilepsy, X-Linked recessive, Claes Jensen syndrome

LENNOX GASTAUT SYNDROME IN A 18-YEAR OLD FEMALE WITH DEVELOPMENTAL DELAYS: A CASE REPORT

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Introduction: Lennox-Gastaut syndrome (LGS) is a pediatric epilepsy syndrome characterized by a triad of seizures, cognitive dysfunction, and abnormal electroencephalography findings, such as abnormal and consistent slow spike waves (<3Hz) on the EEG. The pathophysiology of LGS is still unknown. Various therapeutic approaches are used in LGS, ranging from conventional antiepileptic agents to diet and surgery, but treatment is often ineffective.

Case Report: An 18-year-old Chinese female patient with a history of seizures. Seizures first occured at the age of 6 months, where the patient often appeared startled when waking up, eyes glancing to the left with a duration of <10 seconds, but there was no stiffness. The patient latter experienced another onset of seizure at around 10 years old, lasting about 1 minute where the patient became unconscious with eyes looking up and all four extremities were stiff. In the past year this pattern of seizure repeated. Patient also experienced growth and developmental delays, currently patient can only speak short sentences and single words. Communication with patient is difficult and patient tends to be uncooperative.

Discussion: LGS is one of the epileptic encephalopathies, marked by very frequent seizure that is difficult to treat with anticonvulsant drugs. The diagnosis of LGS should be suspected in children under 8 years of age with refractory and drug resistant seizure. In most patients with LGS, treatment does not stop seizure recurrence. This patient in particular has experienced frequent recurring seizures despite regular treatment, in addition to marked developmental delays.

Conclusion: Lennox–Gastaut syndrome (LGS) is an epilepsy syndrome that is rare, complex and difficult to treat. Therapeutic management aims to reduce the frequency and severity of seizures as much as possible. Special attention needs to be given to patients with LGS to improve prognosis and quality of life.

Keywords: Lennox Gastaut Syndrome, Pediatric Epilepsy, Developmental Delays, Refractory Seizure

TEMPORAL LOBE SYNDROME AS A CLINICAL MANIFESTATION OF BRAIN METASTASES

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Introduction: The temporal lobe plays a vital role in several brain functions, including auditory perception, memory formation, emotional regulation, and learning. Damage to this area can result from various conditions, one of which is metastatic brain tumors. When such tumors affect the limbic system—located in the medial temporal lobe—patients may present with behavioral changes, cognitive decline, and memory disturbances. The incidence of temporal lobe syndrome due to metastatic brain tumors is difficult to determine accurately, as such cases are rare, particularly when the tumor involves both temporal lobes.

Case Description: A 55-year-old male presented with persistent headaches that worsened over the two weeks prior to hospital admission. In addition to headaches, the patient exhibited incoherent speech, nighttime restlessness, and insomnia. He became easily irritable, frequently angry, and experienced episodes of aggression. According to his family, he had shown signs of memory impairment two months prior to admission. Brain MRI revealed metastatic tumors in both the right and left temporal lobes. The patient had a medical history of small cell lung carcinoma and had completed chemotherapy in May 2024.

Discussion: Temporal lobe syndrome is a neurological condition resulting from dysfunction in the temporal lobes. These lobes are essential for auditory processing, emotional control, and memory function. Tumors that affect the medial temporal lobe, especially those involving the limbic system, often lead to symptoms such as memory impairment, speech disturbance, and behavioral changes. The limbic system plays a crucial

role in emotional response, motivation, and memory integration. In this case, tumor infiltration into the limbic system contributed to the patient's cognitive and behavioral symptoms.

Conclusion: Metastatic brain tumors involving the temporal lobes—particularly the limbic system—can lead to behavioral changes, memory impairment, and overall cognitive dysfunction, as demonstrated in this patient.

Keywords: Behavioral changes, memory impairment, temporal lobe syndrome, brain metastases

CENTROTEMPORAL SPIKE ON EEG AS A HALLMARK OF ROLANDIC EPILEPSY: A RARE CASE REPORT

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Background: Rolandic epilepsy, also known as Benign Epilepsy with Centrotemporal Spikes (BECTS), is among the most common types of focal epilepsy in children, particularly between the ages of 3 to 13 years. It is typically characterized by brief, nocturnal focal seizures involving the face or oropharyngeal muscles, often without impairment of consciousness. Diagnosis is confirmed by the presence of characteristic centrotemporal spikes on electroencephalography (EEG). Although considered self-limiting and benign, certain patients may exhibit atypical features, such as frequent seizures, early onset, or bilateral EEG findings, which require careful monitoring and tailored treatment.

Case Report: We report a rare and notable case involving a 7-year-old boy who experienced recurrent focal seizures during sleep, primarily involving involuntary chewing movements and hypersalivation, without loss of consciousness. EEG evaluation demonstrated bilateral centrotemporal spikes with a predominance on the right hemisphere. Brain MRI did not reveal any structural abnormalities. The patient was started on valproic acid syrup, with subsequent clinical improvement and good seizure control over follow-up.

Conclusion: Centrotemporal spikes on EEG are considered the hallmark of Rolandic epilepsy. Recognition of this electrographic pattern is critical for timely diagnosis and management. Even in cases presenting with bilateral or atypical features, early identification and appropriate antiepileptic therapy can lead to favorable outcomes. Further studies are needed to understand the full spectrum and prognostic factors associated with atypical BECTS presentations.

Keywords: Rolandic epilepsy, centrotemporal spikes, benign epilepsy, focal seizure, pediatric EEG

THE UNCOMMON AETIOLOGY OF A VERY COMMON PRESENTATION: MESIAL TEMPORAL LOBE EPILEPSY SECONDARY TO NEUROPSYCHIATRIC SYSTEMIC LUPUS ERYTHEMATOSUS SYNDROME

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Introduction: Neuropsychiatric manifestation of systemic lupus erythematosus (SLE) was estimated to occur around 56.3% [1]. Seizure constitute approximately1.6% of all the neurological presentations [2], and majority of seizure occur during the flare of the disease. However, mesial temporal lobe epilepsy (MTLE) is not a common cause of seizure following SLE and only occur in 2.9% of cases [3].

Case Descriptions: Here we present a 38-year-old woman with a drug-resistant MSTLE who developed focal onset impaired awareness automatism seizures that occur mostly at night. The seizure was associated with oral and hand automatisms (cheek puffing with chewing movement and hand rubbing) that occur for several minutes and followed by post ictal drowsiness and confusions. Her antiseizure medications include oral Topiramate 100mg twice daily, oral Levetiracetam 1.5gm twice daily, oral Carbamazepine 600mg twice daily, and oral Clobazam 10mg once daily. She has history of tuberculous meningitis 20 years ago which has completed treatment, and SLE with neuropsychiatric involvement diagnosed 15 years ago. Her SLE was stable, and the last flare episode was four years ago. Her ANA and ds-DNA was positive but other autoantibody testing including neural-specific antibody was negative. Electroencephalogram shows posterior dominant rhythm with frequent spikes and sharp waves with intermittent 3-4 Hz delta activity over the left anterior temporal region (F7-T3). MRI brain shows left hippocampus sclerosis with multiple T2-sequence hyperintense lesions over the left occipital lobe. She was arranged for temporal lobe resection surgery in view of the drug-resistant epilepsy.

Discussion: Although seizure is commonly reported as one of neuropsychiatric manifestation of SLE, most literature grouped together acute symptomatic seizure and epilepsy. Furthermore, detailed description of MTLE among neuropsychiatric SLE patient is very limited, and the pathogenesis is still unclear [4].

Conclusion: MTLE should be considered as one of the causes of refractory seizure in patients with SLE

VIRAL ENCEPHALITIS DUE TO HERPES SIMPLEX VIRUS INFECTION MANIFESTING AS STATUS EPILEPTICUS: A CASE REPORT

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Introduction: Viral encephalitis is brain parenchyma inflammation caused by viral infections, characterized by fever, headache, seizures, and altered mental status. Herpes Simplex Virus (HSV) is a primary viral cause, often presenting as Status Epilepticus (SE), and poses management challenges due to its neurotropic nature.

Case Description: A 26-year-old woman was referred with decreased consciousness and frequent generalized tonic-clonic seizures for three weeks. She had previously been admitted to a private hospital and treated in the ICU. One week before that, she experienced fever and moderate-to-severe headache. Upon admission, her GCS was E3M5Vx (verbal unassessable due to tracheostomy). Neurological examination revealed no signs of meningeal irritation. Cerebrospinal fluid analysis showed pleocytosis with mononuclear dominance. Immunoserology was reactive for HSV-1 IgM, HSV-2 IgM, and HSV-2 IgG. The head CT-scan was unremarkable. EEG showed diffuse background slowing, indicating global cerebral dysfunction. Herpes Simplex Encephalitis (HSE) was diagnosed based on these findings. Seizures were initially managed with IV diazepam and phenytoin drip, followed by maintenance therapy with levetiracetam, valproic acid, and clobazam. After 38 days of treatment, she was discharged with clinical improvement.

Discussion: SE in HSE requires a multifaceted treatment strategy. Staged polytherapy with anticonvulsants targeting different neural pathways was essential in this case. Levetiracetam, valproic acid, and phenytoin acted synergistically to suppress seizures. Phenytoin also provided neuroprotection by reducing glutamate-mediated excitotoxicity. Diazepam was administered initially for rapid seizure control due to its fast onset and short half-life. Clobazam, added after three weeks, is effective in refractory epilepsy. This strategy aligns with evidence favoring polytherapy over monotherapy in encephalitis-related SE.

Conclusion: SE in HSE often requires a combination therapy targeting multiple neural pathways. Early, aggressive seizure control is essential to minimize neurological injury. Ongoing monitoring and treatment adjustment based on clinical response are critical for optimizing outcomes in these complex cases.

Keywords: Herpes Simplex Virus Encephalitis, Status Epilepticus, Viral Encephalitis

GENERALIZED SEIZURES WITH SENSORY AURA IN A PATIENT WITH LEFT MESIOTEMPORAL ARTERIOVENOUS MALFORMATION FOLLOWING HEAD TRAUMA

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Background: Arteriovenous malformation (AVM) is a congenital vascular anomaly characterized by direct connections between arteries and veins, bypassing the capillary network. Intracranial AVMs can remain asymptomatic but often manifest as seizures, intracranial hemorrhage, or progressive neurological deficits.

Case Presentation: A 35-year-old male presented with recurrent generalized tonic-clonic seizures, each lasting approximately 10 seconds, preceded by chills and numbness, followed by transient loss of consciousness. Seizures occurred three times daily. The patient had a history of head trauma from a motorcycle accident, leading to impaired mobility requiring wheelchair assistance. No prior history of seizures was reported. Electroencephalography (EEG) showed normal alpha background activity without epileptiform discharges. Magnetic Resonance Imaging (MRI) revealed a left mesiotemporal AVM measuring 3.8 × 3.3 × 1.2 cm, with serpiginous flow voids and arterial feeders from the posterior cerebral artery. Venous drainage was directed toward the superior sagittal sinus and the maxillary region. Digital Subtraction Angiography (DSA) confirmed AVM involvement of the left middle cerebral artery (MCA) and V3 segment of the left vertebral artery, with impaired MCA flow. Laboratory results were within normal ranges except for mild anemia (Hb 12.7 g/dL) and a slightly elevated INR (1.13). The AVM was classified as Spetzler-Martin Grade 3, and the patient was scheduled for endovascular embolization.

Discussion: Seizures are a common presentation in AVM patients, especially with cortical or mesiotemporal localization. While EEG may not always detect epileptiform activity in structural brain lesions, neuroimaging such as MRI and DSA remains critical for diagnosis. Early identification and treatment are essential to prevent complications such as hemorrhage or irreversible neurological decline. In this case, comprehensive imaging guided the diagnosis and management plan, emphasizing the importance of considering vascular anomalies in new-onset seizures with unremarkable EEG findings.

Conclusion: AVM should be considered in patients with unexplained seizures. MRI and DSA are key in confirming the diagnosis and planning appropriate intervention.

Keywords: Arteriovenous malformation, seizure, mesiotemporal lobe, MRI, DSA, embolization

REPEATED SEIZURE LEADS TO A SURPRISING DIAGNOSIS OF DANDY-WALKER VARIANT IN RURAL AREA: A RARE CASE REPORT

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Introduction: When a child has repeated seizures, epilepsy may be the most likely diagnosis, but it may not be accurate. Previously undiagnosed Dandy-Walker Variant are less likely cause of seizure activity in pediatric patient. Dandy-Walker is a very rare congenital disorder, with an estimated incidence of 1:30,000 live births.

Case Description: The patient, a male child 3 years old, showed clinical symptoms of seizures since 2 years old, referred from Leona Hospital Kupang to WZ Johannes Hospital Kupang for further treatment. Patient came with complaints of stomping movements since 2 years old which occurred almost all day without a known trigger. Patient was so weak that he couldn't stand, sit, and walk by himself. Patient also had difficulty eating and drinking because patient couldn't swallow. Patient was unable to speak and had difficulty sleeping. General and anthropometric status examinations revealed poor nutrition and staggering movements. Neurological status examination found balance disorders, seizures, limb weakness, involuntary movements, and nystagmus. Complete blood examination found no abnormalities while CT scan examination found Dilated ventricle IV connected to cistern magna, hypoplasia of vermis cerebelli ec Dandy-Walker variant (Isolated inferior vermian hypoplasia), not enlarged Posterior fossa and cerebellar hemisphere, and not accompanied by hydrocephalus. Patient received parenteral nutrition, anticonvulsants, and nasogastric tube for enteral nutrition.

Discussion: The cause of Dandy-Walker is still unknown. Dandy-Walker variant is characterized by cerebellar vermian hypoplasia, cystic fourth ventricular dilatation, and normal posterior fossa volume. Symptoms of Dandy-Walker variant arise in childhood as it is a congenital disorder. Magnetic resonance imaging (MRI) and computed tomography (CT) examinations are used for diagnosis. Management of Dandy-Walker variant is with supportive therapy and surgical therapy.

Conclusion: Dandy-Walker variant is a rare case and has clinical symptoms that are not obvious at the time of birth. The disease can be established using radiologic modalities.

Keywords: Dandy-walker Variant, Seizure, Involunter, Ventricel dilatation, Hypoplasi Cerebelli

SPEEDING UP FACIAL RECOVERY IN SEVERE BELL'S PALSY: THE ROLE OF DRY NEEDLING WITH ELECTRICAL STIMULATION

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Introduction: Bell's palsy is a common condition characterized by sudden, unilateral facial paralysis due to idiophatic peripheral facial nerve dysfunction. While most patients recover within 3-6 months, individuals with severe Bell's palsy may experience prolonged recovery and incomplete functional restoration. Emerging therapeutic approache, such as dry needling with electrical stimulation, has been reported to potentially accelerate facial nerve recovery.

Case Report: A 42-year-old female presented with 3-weeks history of sudden-onset lesft-sided facial weakness, difficulty closing the left eye, deviation of the mouth to the right. The patient had undergone a complete steroid therapy but had not experienced an improvement. Neurological examination revealed peripheral-type left facial nerve paresis, with a House-Brackmann Facial Grading Scale (HBFGS) score of IV and Facial Nerve Recovery Profile (FNRP) score of III. Dry needling with electrical stimulation was performed targeting facial muscles involved in motor function such as the frontalis, corrugator supercilii, depressor supercilii, procerus, orbicularis oculi, zygomaticus major and minor, risorius, nasalis, orbicularis oris, levator labii superior, depressor labii inferior, and depressor anguli oris. Each session lasted 20 minutes and was conducted once per week. After four sessions, the patient showed significant clinical improvement, with increase of HBFGS grade from IV to II, and FNRP grade from III to I. No adverse effects were reported throughout the treatment course.

Discussion: Dry needling with electrical stimulation appears to be a promising adjunctive therapy for the management of severe Bell's palsy. By enhancing neuromuscular activation, improving local blood flow, and promoting nerve regeneration, this intervention may shorten recovery time and improve functional outcomes.

Conclusion: This case highlights the potential benefits of dry needling with electrical stimulation in accelerating facial recovery in patient with severe Bell's palsy. The intervention was well-tolerated and resulted in marked functional improvement. Incorporating this approach into early rehabilitation may enhance outcomes, especially in cases unresponsive to conventional treatment.

Keywords: Bell's palsy, dry needling, electrical stimulation

DUCHENNE MUSCULAR DYSTROPHY IN THREE CASE: CASE SERIES HIGHLIGHTING SUBCLINICAL TO PROGRESSIVE PRESENTATIONS AND DIAGNOSTIC APPROACHES

Agustini Pratiwi Kadir, Yudy Goysal, Abdul Muis

Introduction: Duchenne Muscular Dystrophy (DMD) is a progressive X-linked recessive neuromuscular disorder that typically presents in early childhood. It is characterized by progressive proximal muscle weakness, eventually leading to loss of ambulation and cardiopulmonary

complications. Early diagnosis and regular monitoring of high-risk individuals are essential for improving quality of life and extending life expectancy.

Case Descriptions: This report describes three cases illustrating the clinical spectrum of DMD. Two cases involved symptomatic boys aged 17 and 9 years, with initial symptoms including toe walking, frequent falls, difficulty clim`bing stairs, and a positive Gower's sign. Their conditions worsened following upper respiratory tract infections. The third case involved a 4-year-old boy with a siblings history of DMD but no clinical symptoms. Elevated creatine kinase (CK) levels were observed, indicating subclinical involvement. Diagnostic procedures included electromyography (EMG), which showed a myopathic pattern in one case, and a gastrocnemius muscle biopsy in another, revealing fatty infiltration consistent with DMD.

Discussion: These cases represent different clinical stages of DMD: advanced, progressive, and pre-symptomatic. The findings highlight the importance of early detection, especially in high-risk families, to enable timely intervention, slow disease progression, and support family education and long-term planning. Despite these benefits, challenges such as limited access to genetic testing and psychosocial barriers remain significant obstacles.

Conclusion: A multidisciplinary approach and proactive screening in at-risk populations are key to improving the quality of life for individuals with DMD. Strengthening diagnostic capabilities and public awareness is essential to ensure comprehensive care.

Keywords: Duchenne's Muscular Dystrophy, Myopathy, Inherited disorder

CLINICAL IMPROVEMENT IN GAIT AND TREMOR FOLLOWING LOW-FREQUENCY CEREBELLAR rTMS IN A PATIENT WITH SPINOCEREBELLAR ATAXIA SYNDROME: A CASE REPORT

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Introduction: Spinocerebellar ataxia (SCA) is a progressive neurodegenerative disorder characterized by cerebellar dysfunction, leading to gait disturbances, balance impairment, and tremor. Currently, there is no definitive cure for SCA, and symptomatic treatments remain limited. Repetitive transcranial magnetic stimulation (rTMS) targeting the cerebellum has emerged as a promising non-invasive neuromodulation technique, with recent studies indicating its potential to improve ataxia symptoms and motor coordination in patients with cerebellar disorders.

Case Report: An 18-year-old female presented with progressive difficulty of walking, balance disturbance, and tremors. Neurological examination revealed abnormal tandem gait and kinetic tremor, supporting a clinical diagnosis of spinocerebellar ataxia syndrome, although genetic confirmation was not performed. Brain MRI revealed no significant structural abnormalities. The patient underwent low-frequency rTMS at 1 Hz with total of 1800 pulse stimulation in 30 minutes daily over five sessions targeting the cerebellum. Following rTMS therapy, the patient reported significant clinical improvement in gait and tremor. Objective evaluation demonstrated a reduced Scale for the Assessment and Rating of Ataxia (SARA) score from 7 to 6 and improved performance of the Archimedean spiral drawing test.

Discussion: The clinical improvement in this patient after cerebellar rTMS suggests its potential as an effective therapeutic approach for managing symptoms of SCA. Low-frequency rTMS applied to the cerebellum has been reported to suppress cerebellar excitability by activating Purkinje cells. These cells exert an inhibitory effect on the dentato-thalamo-cortical pathway, thereby indirectly reducing hyperexcitability of the primary motor cortex (M1). Cerebellar rTMS may also increase blood flow to targeted brain regions, which can further support the restoration and improvement of cerebellar function.

Conclusion: This case supports the use of cerebellar rTMS as a non-invasive therapeutic option to alleviate gait and tremor symptoms in spinocerebellar ataxia syndrome. Further research involving larger cohorts with confirmed genetic diagnosis is essential to validate the clinical benefits of cerebellar rTMS in spinocerebellar ataxia and to develop standardized treatment protocols.

Keywords: Spinocerebellar ataxia, cerebellar rTMS, low-frequency rTMS, gait disturbance, tremo

DIAGNOSTIC APPROACH TO BECKER MUSCULAR DYSTROPHY WITHOUT GENETIC TESTING: A CASE REPORT

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Introduction: Becker muscular dystrophy (BMD) is a rare, X-linked recessive neuromuscular disorder caused by mutations in the dystrophin gene. Characterised by progressive muscle weakness, BMD typically manifests later and with milder symptoms than Duchenne muscular dystrophy. While genetic testing remains the diagnostic gold standard, alternative diagnostic pathways are essential in resource-limited settings.

Case Description: We describe an 18-year-old male presenting with a two-year history of progressive weakness in the lower limbs. He experienced difficulty standing from a seated position, frequent falls, and pseudohypertrophy of the calves, along with a positive Gower's sign. Laboratory investigations showed markedly elevated serum creatine kinase and transaminase levels. Electromyography revealed a myopathic pattern with features of secondary demyelinating sensory-motor polyneuropathy. A muscle biopsy demonstrated histopathological features typical of dystrophinopathy, including fiber size variability, necrosis, regeneration, and fatty infiltration. These findings supported a clinical diagnosis of Becker muscular dystrophy. Informed consent was obtained from the patient for the publication of this case.

Discussion: Although molecular genetic analysis provides definitive confirmation, this case illustrates the value of a multidisciplinary diagnostic strategy when such testing is unavailable. Clinical findings, serum biomarkers, electromyography, and histopathology were effectively combined to establish the diagnosis. The patient received corticosteroid therapy and physiotherapy, which led to observable clinical improvement at a three-month follow-up.

Conclusion: In environments where genetic testing is not accessible, a structured diagnostic approach integrating clinical evaluation with biochemical, electrophysiological, and histological assessments is vital for diagnosing BMD. Timely diagnosis and initiation of treatment can enhance clinical outcomes and quality of life in affected individuals.

Keywords: Becker muscular dystrophy, muscle biopsy, electromyography, creatine kinase

UNILATERAL HYPERKINETIC CHOREIFORM MOVEMENT DISORDER DUE TO CALCIFICATION OF LENTIFORM AND CAUDATE NUCLEUS IN POORLY CONTROLLED DIABETIC PATIENT: A CASE REPORT KHMER SOVIET FRIENDSHIP HOSPITAL, CAMBODIA, 22 SEP. 2024

Prof. CHUM Navuth, Dr. SUOS Sem, Dr. TEAV Veasna, Dr. PROUM Chhoeun, Dr. SÂN Phalnika, Dr. MEN Puthik, Dr. PHENG Sokhunthea, Dr. SOENG Sievleng, Dr. KEO Veasna, Dr. HENG Ouchhay, Res. TITH Vibol, Int. SAM Vuthearith

Hemiballismus is a hyperkinetic involuntary movement disorder characterized by intermittent, sudden, high amplitude of involuntary movements involving unilateral arm and leg, caused by dysfunction in the central nervous system of the contralateral side. Hemiballismus refers to most severe form within the spectrum of chorea, while the term Chorea is an involuntary movement disorder characterized by brief, sudden, spontaneous, dance-like movements in one side of the body. The classic medical school textbook localized the lesion at the subthalamic nucleus (STN); additionally, the other research also localizes the lesions in other parts of the basal ganglia and caudate nucleus.

It caused by excessive subcortical excitatory activity as a result of damage to the inhibitory circuit within the basal ganglia. Etiologies can be vascular, traumatic, neoplastic, toxic-metabolic, neuroinfectious,

neuroinflammatory, iatrogenic, vitamin deficiency, hereditary neurodevelopment, or neurodegenerative disorder. Pathophysiology involving dysfunction of caudate and putamen, due to their role is essential to the afferent pathway of the basal ganglia, acts as a major source of inhibition of the globus pallidus externa (GPe). When injured or degenerated, the caudate and putamen are no longer able to adequately transport the major inhibitory neurotransmitter (GABA) to the globus pallidus, resulting insufficient inhibitory effect on the thalamus, leading to hyperkinetic movements contralaterally to the lesional hemisphere.

This index case report describes a patient a patient who presented with unilateral hyperkinetic involuntary movement disorder of the left arm and leg caused by calcification over right-sided lentiform and caudate nucleus.

Case Presentation: A 75-year-old female patient with remarkable medical history related to hypertension, and poorly controlled type 2 diabetes mellitus for past 2 years, presented with involuntary abnormal movement over left side of her body, particularly involving both arm and leg. This symptom occurred spontaneously and progressive over passed 7 days despite conservative measures at home. She described it as abnormal, uncontrollable movements that made her arm 'reach around or fling out', while the leg was also described to 'dance on its own'. There were no movement issues on his right side, nor any facial movements noted.

On presentation, she was alert, well-cooperated, with GCS=15/15, and normal pupils; along with a stable vital sign. Her exam showed episodic, mild-moderate amplitude of quick movements of the left hand, forearm, proximal arm muscles, as well as movement of the left leg (video.1). These were not suppressible, but brought out more by distraction or with anxiety. She also demonstrated some lateralizing movements of the head to the left, but no facial or tongue movements (video.2). His right side showed no such signs, and her neurological exam was otherwise unremarkable.

Neuroimaging study upon CT scan without contrast injection of the head was found to have asymmetric calcification of the right lentiform and caudate nucleus Laboratory work up for parenchymal calcification was then sent, showing a high blood glucose level (263mg/dL), elevated HbA1c (10.4), while the other tests are unremarkable.

Base on her unilateral hyperkinetic choreiform movement correlated with opposite site of hemispheric parenchymal calcification, she was diagnosed with left hemichorea as a result of lentiform and caudate nucleus calcification of the right hemisphere. She was then treated with Haloperidol 2.4mg, BID along with a strictly controlled over her glycemic status upon short acting Insulin guiding by sliding scale, there was a significant improvement over her hyperkinetic movements in just few days ahead.

Discussion: A case report regarding Hyperglycemia-induced hemiballismus hemichorea, that was published on May 2, 2010, highlighting the metabolic cause of unilateral hyperkinetic involuntary movement in poorly controlled glycemic status of DMT2 patient, particularly in case of hyperosmolar hyperglycemic syndrome (HHS). Because our patient has a prolonged poorly controlled diabetic history with HbA1c of 10.4, with her blood glucose level of 263mg/dL; therefore hyperglycemia-induced hemichorea cannot entirely rule out, however; the patient's head CT scan evident the calcification lesion of right basal nuclei, suggesting the clinical picture toward such lesion is more likely.

Another case report regarding Unilateral Hyperkinetic Choreiform Movements due to Calcification of the Putamen and Caudate that was published on 31 Jan. 2019, yielding the cause of calcification was consequence from an Underlying Developmental Venous Anomaly (DVA); however, due to our limitation in our study, the MRI studies was not available, thus we cannot rule out such possibility of DVA in our patient. As DVAs are common vascular malformations, and occasionally been shown to cause unilateral calcification of the caudate and anterior putamen due to venous hypertension in the territory drained by the DVA, it therefore makes theoretical sense that the mineralization of the putamen and caudate.

Due to treatment modalities are mostly supportive as the prognosis of hemichorea is generally good, it tends to self-resolve when underlying etiology is addressed. Pharmacological treatments includes first and second-generation antidopaminergic drugs (risperidone, haloperidol, perphenazine), benzodiazepines (clonazepam), anti-epileptics (topiramate), and baclofen, is enough to controlled over her abnormal movement.

Conclusion: This case report describes a patient who presented with unilateral hyperkinetic choreiform movements of the left arm, and leg caused by right-sided lentiform and caudate calcification. Series of neurological studies such as; head CT, and MRI, confirming with laboratory screening, seems reasonable in cases of abnormal choreiform movement to detect underlying cause and manage it properly. More studies are still warranted to clarify the exact mechanism of such event

Keywords: Hemiballismus-hemichorea, calcification of lentiform nucleus.

WHEN THE BELLY DANCES AND BREATHING STRUGGLES: BELLY DANCER DYSKINESIA PRESENTING WITH DYSPNEA: A CASE REPORT

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Introduction: Belly dancer's dyskinesia (BDD) is a rare condition (<8.6 cases per 100,000 people) characterized by involuntary movement of abdominal wall, the diaphragm, and other respiratory muscles that are rhythmic, repetitive, and dyskinetic. These terms may be used interchangeably with diaphragmatic flutter in a few case reports. Because of its variable presentation, diagnosis can often be difficult and delayed.

Case Description: A 45-year-old woman reported abnormal, involuntary, rhythmic, painless tremor-like abdominal movements, especially noticeable at the end of expiration and persisted throughout the day. These movements resembled those seen in BDD. The patient was being treated in by internal medicine department for pneumonia and typhoid fever, with a background of HIV infection. There were no other neurological deficits or signs. At the time of evaluation, no radiological imaging or other supporting neurological investigations (e.g., EMG or MRI or Diaphragmatic fluoroscopy) had yet been performed. Clobazam 5 mg once daily was initiated for the patient, which led to noticeable clinical improvement within several days.

Discussion: BDD may affect respiratory function and has been linked to numerous different etiologies. This phenomenon is suspected to result from abnormal phrenic nerve excitation or direct diaphragmatic irritation due to inflammation caused by HIV infection. However, the exact pathophysiology of this case remains poorly understood and diagnosis remains a challenge.

Conclusion: The mechanism of BDD remains unclear, with no gold-standard diagnostic test or treatment guidelines. Diagnosis is clinical and often delayed due to its rarity. Although BDD and diaphragmatic myoclonus differ phenomenologically, distinguishing them is challenging due to inconsistent terminology, limited EEG-EMG data in literature, and overlapping clinical features. Thus, it is crucial for clinicians to be aware of the symptoms and develop a high index of suspicion for prudent evaluation and management of patients.

Keyword: Abdominal wall dyskinesia, belly dancer's dyskinesia, diaphragmatic flutter, respiratory myoclonu

DIAGNOSTIC CHALLENGES OF VESTIBULAR SCHWANNOMA IN YOUNG ADULT: A CASE REPORT IN A 19-YEAR-OLD FEMALE

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Introduction: Vestibular schwannoma (VS), or acoustic neuroma, is a benign tumor of Schwann cell origin affecting the vestibulocochlear nerve, typically occurring in individuals aged 40–60. Globally, the incidence ranges from 3.0 to 5.2 per 100,000 person-years, with increased prevalence in those over 70. Lifetime prevalence is estimated at over 1 in

500 individuals. VS is rare in adolescents and young adults, posing diagnostic challenges, particularly when presenting with atypical features or comorbid conditions. In Indonesia, epidemiological data on VS remain scarce.

Case Presentation: A 19-year-old unmarried female presented with a two-month history of intermittent vertigo lasting for 20–30 minutes, triggered by head movement, and a right-sided hearing difficulty. She had a history of menorrhagia and irregular menstruation since the age of 12. Gynecologic assessment revealed a hormonal dysregulation and was treated with Dienogest. Brain MRI with contrast revealed an inhomogeneous mass in the right cerebellopontine angle with cystic components, showing a vestibular schwannoma and causing brainstem compression. She underwent retrosigmoid craniotomy and tumor removal through a combined translabyrinthine approach. Histopathology confirmed schwannoma. She was improved progressively during the following day after surgery with some treatments including corticosteroids, vestibular suppressants, and antiemetics.

Discussion: VS is uncommon in young individuals, particularly without Neurofibromatosis type 2 (NF2). This case highlights the diagnostic challenges of VS since it is uncommon in young adults. In this case, vestibular symptoms are found with unilateral hearing loss. Brain MRI plays a big role in patients with vertigo and red flags symptoms. The etiology of VS remains unclear, while hormonal imbalances are not proven etiological factors, their influence on tumor behavior warrants further study. Surgical resection remains the mainstay of treatment in symptomatic or large tumors.

Conclusion: MRI should be considered in patients with spontaneous chronic vertigo syndrome and unilateral hearing loss even in young age.

Keywords: Adolescent, Vestibular Schwannoma, Vertigo, Magnetic Resonance Imaging

MULTIMODAL IMAGING IN YOUNG ONSET PARKINSON'S DISEASE WITH MILD COGNITIVE IMPAIRMENT: A CASE REPORT

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Introduction: Parkinson's Disease (PD) is a progressive neurodegenerative disorder characterized by motor and non-motor symptoms, including cognitive and psychiatric manifestations. Multimodal imaging plays a pivotal role in confirming diagnosis and evaluating disease progression.

Case Presentation: A 61-year-old male with a history of PD since 2008 and currently Hoehn and Yahr stage 2.5 experienced tremor and rigidity with wearing-off, and non-motor symptoms such as cognitive impairment, emotional lability and auditory hallucinations. Brain MRI showed absent swallow tail sign in the substantia nigra, with mild cerebral atrophy and white matter lesions. DaTSCAN SPECT demonstrated reduction in dopamine transporter uptake in the striatum. FDG-PET imaging revealed hypometabolism in bilateral prefrontal cortices, and parietal cortex.

Discussion: This case presents a young-onset Parkinson's disease (YOPD), who developed amnestic-mild cognitive impairment (MCI) which could be found in approximately 50% of advanced PD. Emerging evidence suggests patients with PD may also exhibit coexisting beta-amyloid pathology, contributing to cognitive decline. MRI and DaTSCAN SPECT supported the diagnosis of PD, FDG-PET demonstrated cortical hypometabolism consistent with PD–Related Cognitive Pattern (PDCP), but partial overlap in regions typically affected in Alzheimer's disease. Further evaluation using amyloid PET or cerebrospinal fluid (CSF) analysis is recommended to assess coexisting Alzheimer pathology which is crucial for diagnosis and therapeutic strategies.

Conclusion: This case illustrates YOPD patient confirmed by multimodal imaging showing a slow yet progressive amnestic MCI and behaviour symptoms aside of motor complication. The possibility of overlapping Alzheimer-type pathology needs further evaluation, which may influence both prognosis and therapeutic strategy.

Keywords: Parkinson's Disease, Cognitive Impairment, DaTSCAN, FDG-PET, PDCP

CEREBELLAR AND SOMATOSENSORY CORTEX TARGETED THETA BURST STIMULATION TMS IN CERVICAL DYSTONIA PATIENT: A CASE REPORT

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Introduction: Cervical dystonia (CD) is the most prevalent focal dystonia, characterized by involuntary contractions of head and neck muscles, leading to abnormal postures and significant functional impairment. Non-invasive Brain Stimulation (NIBS) has emerged as a potential therapeutic approach. Increasing evidence supports dystonia as a network disorder, with key involvement of the Cerebellum (Crb) and primary somatosensory cortex (S1).

Case: A 26-year-old male with a 3-year history of segmental CD presented with rightward torsion involving the head, neck, lower face, lips, tongue, and right upper arm. At baseline, the Unified Dystonia Rating Scale (UDRS) was 17 (duration: 2, motor severity: 15), with motor involvement as follows: eyes and upper face 1, lower face 2, jaw and tongue 3, larynx 1, neck 3, shoulder and right proximal arm 2, trunk 3. He received continuous theta burst stimulation (cTBS) over the contralesional S1 and intermittent TBS (iTBS) over mCrb. The UDRS was improved to 8 (duration: 1; motor severity: 7), with notable reduction across affected regions except the jaw and tongue. No further improvement after the fifth session, and the patient elected to discontinue treatment.

Discussion: This case supports the network model of CD and suggests that combined TBS may modulate pathological circuits involving the Crb and S1. The observed improvement is consistent with studies linking sensorimotor integration deficits to CD. Persistent symptoms in the jaw and tongue may reflect a limited somatotopic spread of the stimulation, either a resistance to the region-specific network. The response plateau and single-patient design warrant cautious interpretation, as placebo effects cannot be excluded.

Conclusion: This report suggests that combined TBS targeting S1 and Crb may offer a promising NIBS approach for CD. However, further controlled studies are needed to confirm efficacy, understand regional responsiveness, and optimize the protocol.

Keywords: Non-Invasive Brain Stimulation, Transcranial Magnetic Stimulation, Theta Burst Stimulation, Cervical Dystonia

FROM SYMPTOMS TO DIAGNOSIS: A CASE REPORT OF DUCHENNE MUSCULAR DYSTROPHY IN A CHILDREN

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Introduction: Duchenne Muscular Dystrophy (DMD) is the most common inherited neuromuscular disorder in children, caused by mutations in the DMD gene leading to absence of dystrophin. Early clinical signs such as delayed motor milestones, frequent falls, and proximal muscle weakness are often subtle and misinterpreted. Delay in diagnosis may postpone essential interventions that could slow disease progression and improve functional outcomes.

Case Presentation: A 5-year-old boy was referred to our neurology clinic with complaints of difficulty walking, frequent falls, and inability to rise from the floor independently. Symptoms had been progressively worsening since the age of 3, but no diagnosis had been made. Physical examination revealed a waddling gait, Gowers' sign, pseudohypertrophy of the calf muscles, and symmetrical proximal weakness. Electromyography showed a myopathic pattern. The patient was started on corticosteroids and referred to multidisciplinary rehabilitation. This case illustrates a two-year delay from symptom onset to diagnosis.

Discussion: Delayed diagnosis of DMD remains a major concern, especially in developing countries. Contributing factors include non-specific early symptoms, limited access to genetic testing, and lack of

awareness among primary care providers. Clinical signs such as Gowers maneuver and calf hypertrophy are hallmark features of DMD and should prompt immediate further investigation. Early initiation of corticosteroid therapy has been shown to prolong ambulation and improve respiratory and cardiac outcomes.

Conclusion: This case illustrates the importance of early recognition of classic clinical features of Duchenne Muscular Dystrophy. Delayed diagnosis can lead to poorer outcomes and missed opportunities for early intervention

Keywords: Duchenne muscular dystrophy, Gowers sign, Diagnostic delay, Treatment dela

A CASE SERIES OF FALSE POSITIVE ANTI-ACETYLCHOLINE RECEPTOR ANTIBODY

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Introduction: Myasthenia gravis is an autoimmune neuromuscular disorder typically characterized by skeletal muscle weakness. Anti-acetylcholine receptor (AChR) antibody test is very specific for myasthenia gravis. However, there are rare occurrences of false positive AChR antibody. Here, we illustrated a case series of three different neurological conditions which mimicked clinical course of myasthenia gravis.

Cases: Patient 1: A 43-year-old lady presented with progressive lower limb weakness for eight months and bulbar symptom for one month. She was intubated for respiratory distress. AChR antibody returned positive, 1.24nmol/L (positive>0.5). Treated with intravenous immunoglobulin (IVIG), steroid and then plasmapheresis; but to no avail. Neurophysiological test was delayed due to ventilation issue and when finally done, clinched the diagnosis of motor neuron disease. Patient 2: A 67-year-old lady complained of progressive bilateral eye ptosis and ophthalmoplegia for 6 years. She had positive family history of similar eye symptom. Her AChR antibody was positive 1.05nmol/L and had trial of pyridostigmine but no improvement. The repetitive nerve conduction study (NCS) and single fiber electromyography were normal. Whole exome sequencing was offered but she declined. She was diagnosed as chronic progressive external ophthalmoplegia (CPEO). Patient 3: A 50-year-old lady with diabetes mellitus, presented with bulbar symptom and ataxia. Nasopharyngolaryngoscopy and MRI brain were normal. Her AChR antibody was positive 0.98nmol/L, however neurophysiological study demonstrated sural sparing, demyelinating sensorimotor polyneuropathy. She was treated with IVIG. However, her condition became worse soon after. Hence was subjected for 5 cycles of plasmapheresis, to which she responded well. She was eventually diagnosed as acute motor sensory axonal neuropathy (AMSAN), with treatment related fluctuation.

Conclusion: These cases illustrate the importance of clinical correlation with neurophysiological tests. Presence of anti-acetylcholine receptor antibody is not always equivalent to myasthenia gravis.

Keywords: anti-acetylcholine receptor antibody, myasthenia gravis

RECOVERY IN GUILLAIN-BARRÉ SYNDROME TYPE MILLER FISHER FOLLOWING THREE CYCLES OF PLASMA EXCHANGE: A CASE REPORT

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Introduction: Guillain-Barre syndrome (GBS) is a heterogeneous autoimmune disorder characterized by peripheral neuropathy, often triggered by preceding infections. Miller Fisher Syndrome (MFS) is a rare variant of GBS with a triad of symptoms including areflexia, ataxia, and ophthalmoplegia. Treatment options include intravenous immunoglobulin therapy or plasma exchange (PE). Plasma exchange is recommended to be given in 4-5 cycles.

Case Description: A 38-year-old male presented with imbalance, transient diplopia, progressive ptosis, tingling in the ankles and wrists, and weakness in all four extremities following a recent fever and cold. Examination revealed stable vitals, decreased deep tendon reflexes, flaccid type tetraparesis, reduced tactile sensation with sock and gloves pattern, ophthalmoplegia of both eyes and cerebellar ataxia. Cerebrospinal fluid analysis showed elevated protein (cytoalbumin dissociation), suggesting MFS. Nerve conduction studies showed the possibility of GBS cannot yet be ruled out. After three plasma exchange cycles, the patient improved substantially but the movement of both eyes were still limited. At the 1- months follow up the movement of both eyes were unlimited and the patient had no residual symptoms.

Discussion: Plasma exchange removes all substances in plasma including cytokines, immunoglobulins, and other serum factors. Four – five cycles of plasma exchange are required to obtain symptom improvement. Even though plasma exchange was only given 3 cycles, there was a good clinical improvement in all symptoms for this patient at the 1- months follow up.

Conclusion: In this case study, the significant improvement of the patient after PE shows that the importance of early and accurate clinical diagnosis in effectively managing of MFS. Even with incomplete treatment, recovery can take approximately 30 days due to the time required for remyelination of nerve fibers.

Keywords: Case report, gbs, miller fisher syndrome, ophthalmoplegia, plasma exchange

POSTREMA SYNDROME AS INITIAL SYMPTOMS OF NEUROMYELITIS OPTICA SPECTRUM DISORDER IN AN ADOLESCENT WOMAN: A RARE CASE REPORT

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Introduction: Neuromyelitis optica spectrum disorder (NMOSD) is a rare inflammatory and demyelinating disorder of the central nervous system. affects the optic nerve, brainstem, and spinal cord. The prevalence is 0.3 to 4.4 per 100,000 people worldwide. Common in women (80%) between 30 and 40 years. Rare in children (<5% cases). Anti-aquaporin-4 is identified in between 60% and 90%.

Case Report: A 17-year-old woman with sudden weakness of all four limbs, stiffness, and blurred vision. Two months earlier the patient had nausea, repeated vomiting without clear cause. Physical examination showed weakness of all four limbs, increased muscle tone, and decreased vision ODS <3/60. Laboratory examination showed positive ANA-IF, positive serum Anti-Aquaporin-4. MRI cervical with contrast examination showed hyperintense in the T2 segment extending from the C-1 to C-5 spinal cord, hypointense in T1, and did not absorb contrast. The patient was given methylprednisolone therapy at a dose of 1 gram/day for 5 days showed improvement in muscle weakness and vision,but stiffness still persists.

Discussion: Acute weakness of all four limbs can be caused by a lesion at the brain or spinal cord level due to acute inflammation or due to vascular problems. In this patient, the topic can be in the cervical spinal cord segment. While complaints of nausea and vomiting that have occurred since 2 months ago accompanied by hiccups. The absence of complaints of dizziness, hearing loss, normal cerebellar examination can rule out the possibility of vestibular and cerebellar problems. The presence of a picture of transverse myelitis extending >3 segments on contrast cervical MRI and positive serum anti-aquaporin-4 results strengthen the diagnosis.

Conclusion: Visual disturbances, tetraparesis and postrema syndrome with acute onset in adolescent girls can suggest NMOSD. Treatment with high-dose steroids has been shown to be effective in improving neurological deficit symptoms in patients.

Keywords: NMOSD, area postrema syndrome, Tetraparesis, adolescent

RECURRENT ACUTE EXACERBATIONS OF CHRONIC INFLAMMATORY DEMYELINATING POLYRADICULONEUROPATHY AFTER CORTICOSTEROID DISCONTINUATION

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Introduction: Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP) is an autoimmune disease that causes inflammation and damage to the myelin sheath of peripheral nerves. Diagnosing CIDP is challenging and is often underdiagnosed due to its variable clinical presentation. CIDP should be diagnosed and treated promptly to avoid death and prolonged morbidity. Treatment of CIDP includes corticosteroids, intravenous immunoglobulin, and plasmapheresis. However, in some cases, discontinuation of corticosteroids may cause an acute exacerbation of CIDP.

Case Description: A 34-year-old woman was diagnosed with CIDP 7 months ago. She had experienced tingling and numbness in both palms and feet, followed by weakness in all four extremities. She underwent various treatments, including high doses of methylprednisolone, which improved her neurological deficits. The dosage was tapered down slowly until it was completely discontinued. This corticosteroid was given for 2 months. After 2 months of corticosteroid discontinuation, she returned to the clinic with symptoms of acute exacerbation of CIDP.

Discussion: This case describes an acute exacerbation in a patient with CIDP following the discontinuation of corticosteroids. Methylprednisolone was effective in treating CIDP, demonstrating significant improvements on the MRC, INCAT, and ONLS scales during her therapy. However, stopping corticosteroids after 2 months triggered symptom recurrence, suggesting dependence on this treatment. Literature studies support the finding that up to 70% of CIDP patients experience relapse after stopping corticosteroids, with varying timing of relapse. Risk factors such as autoimmune disease, diabetes, hypertension, or previous infections may contribute, although they were not present in this patient.

Conclusion: In this case, the patient initially had a good response to corticosteroids, but after 2 months of discontinuation of corticosteroids, she experienced worsening neurological deficits. The causes of exacerbation upon discontinuation of corticosteroids in CIDP are still unknown. Therefore, periodic evaluation and adjustment of corticosteroid doses are needed for patients with CIDP.

Keywords: Acute exacerbation, CIDP, corticosteroids

NEUROMYELITIS OPTICA SPECTRUM DISORDER: A CASE REPORT

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Introduction: Neuromyelitis Optica spectrum disorder (NMOSD), also known as Devic's disease, is an autoimmune disease of the central nervous system. It primarily targets the optic nerves, spinal cord, and brainstem regions.

Case Description: A 19-year-old female presented with a two-week history of progressive paraparesis preceded with burning sensation. She reported recurrent bilateral eye visual loss of eighteen months' duration. On examination, visual acuity was 1/300 in the left eye and the fundus examination showed hyperaemic on the left optic disc. Neurological examination demonstrated flaccid paraparesis with muscle strength of three, sensory loss below T8 spinal level, and urinary retention. Serological tests showed positive autoimmune markers, including aquaporin-4 antibodies (AQP4-IgG). T2-weighted spinal MRI revealed a central hyperintense lesion extending from the T3 to T7 vertebral segments. Cerebrospinal fluid analysis indicated pleocytosis with neutrophilic predominance. The diagnosis of NMOSD was made using International Panel for NMO Diagnosis (IPND) criteria. Treatment involved intravenous methylprednisolone 500mg twice daily for one week, followed by oral methylprednisolone tapered over three months, alongside initiation of azathioprine 50mg twice daily. The patient achieved full functional recovery except for residual visual impairment in the left eye; follow-up funduscopic examination was normal

Discussion: Aquaporin-4 antibody (AQP4-IgG) and longitudinal extensive transverse myelitis (involving three or more spinal segments) are hallmark features of NMOSD. Management during relapse focuses on preventing further attacks. In this relapsing NMOSD case, a combination of corticosteroids and immunosuppressant, complemented by physiotherapy, was employed to optimize recovery.

Conclusion: This case emphasizes the importance of thorough clinical evaluation, examination and understanding of NMOSD to ensure timely and appropriate treatment, thereby reducing morbidity and mortality associated with the disease.

Keywords: Neuromyelitis Optica, Devic's disease, Aquaporin-4 Antibodies, Transverse Myelitis, Optic Neuritis

PROBABLE MULTIPLE SCLEROSIS WITH SYMPTOMS OF OPTIC NEURITIS, HEMIPARESIS AND HEMIHYPESTHESIA

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Introduction: Multiple sclerosis (MS) is a chronic inflammatory disease of the central nervous system characterized by demyelination and progressive nerve damage. MS commonly affects young adults, especially women. Early symptoms usually include optic neuritis presenting as visual disturbances and eye pain, along with neurological complaints such as tingling, weakness, diplopia, and positive Lhermitte's sign. Diagnosis is based on the 2017 McDonald criteria using clinical symptoms, MRI, and laboratory tests after excluding other diseases.

Presentation: A 57-year-old female patient presented with weakness and tingling on the right side of the body and progressive visual impairment leading to complete vision loss in both eyes, accompanied by eye pain. Neurological examination showed flaccid hemiparesis, hemihypesthesia, and cranial nerve involvement. Brain MRI revealed heterogeneous nodules in multiple areas. A probable diagnosis of multiple sclerosis was made based on optic neuritis, hemiparesis, and hemihypesthesia. The patient was treated with high-dose steroids (methylprednisolone) and supportive therapy by a multidisciplinary team.

Discussion: This 57-year-old female patient exhibited classic features of multiple sclerosis with right hemiparesis, hemihypesthesia, and progressive bilateral optic neuritis. Neurological signs including nystagmus and internuclear ophthalmoplegia indicated optic nerve inflammation and involvement of pyramidal and sensory pathways. Diagnosis was established using the 2017 McDonald criteria with one clinical attack supported by MRI findings. Management focused on preventing relapse and disease progression using high-dose corticosteroids, symptomatic medications, and motor and sensory rehabilitationrevascularization.

Conclusion: Multiple sclerosis presents with diverse clinical manifestations and disease courses. Diagnosis requires a combination of characteristic clinical symptoms, demyelinating lesions, imaging, and/or laboratory tests after excluding other conditions. Treatment includes relapse therapy and long-term management with disease-modifying drugs (DMD).

Keywords: Multiple Sclerosis, Optic Neuritic, Hemiparesis

EXPLORING MULTIPLE SCLEROSIS WITH OVERLAPPING AUTOIMMUNE DISEASES: A CHALLENGING CASE SERIES

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Background: Multiple sclerosis (MS) is a chronic autoimmune disease characterized by demyelination in the central nervous system (CNS),

leading to various neurological deficits. Although MS primarily targets the brain and spinal cord, it may coexist with other autoimmune diseases, such as Sjögren's syndrome and systemic lupus erythematosus (SLE). The prevalence of poly-autoimmunity in MS patients is approximately 8.3%. The diagnosis of MS can be challenging due to overlapping symptoms and variable presentations, and the presence of an additional autoimmune disease may complicate clinical interpretation and delay treatment. In Indonesia, where awareness of autoimmune comorbidities in MS is still limited, the need for multidisciplinary diagnostic approaches becomes increasingly important.

Case Presentation: We report four cases of patients diagnosed with both MS and coexisting autoimmune diseases at Dr. Moewardi General Hospital in 2025. Two patients had relapsing-remitting MS (RRMS) with either Sjögren's syndrome or SLE, and two patients were diagnosed with secondary progressive MS (SPMS) along with the same autoimmune conditions. Clinical manifestations ranged from intermittent to persistent limb weakness, visual disturbances, seizures, and speech impairment. In all cases, the diagnosis of the additional autoimmune disease occurred after the initial onset of MS, highlighting the potential for delayed recognition of overlapping pathology.

Discussion: The coexistence of MS with other autoimmune disorders may result from shared genetic predispositions and common immunopathogenic mechanisms, including chronic inflammation, abnormal immune tolerance, and increased apoptosis. These overlapping processes can complicate clinical presentation and influence treatment outcomes. Early recognition through autoimmune screening and comprehensive neurological assessment is critical in such cases.

Conclusion: There is a pressing need for increased awareness of overlapping autoimmune diseases in MS patients, particularly in regions with limited diagnostic resources. Integrating early screening, continuous monitoring, and personalized therapeutic strategies may lead to better management and improved long-term outcomes.

Keywords: Multiple sclerosis, autoimmune overlap, poly-autoimmunity

DIAGNOSTIC CHALLENGES AND LONG-TERM MANAGEMENT OF CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY IN YOUNG ADULT: A CASE REPORT

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Background: Chronic Inflammatory Demyelinating Polyneuropathy is an immune-mediated inflammatory neuropathy characterized by symmetrical motor weakness and sensory disturbances in both upper and lower extremities. Diagnosing Chronic Inflammatory Demyelinating Polyneuropathy can be challenging, especially during acute onset that mimics Guillain-Barré Syndrome. Early diagnosis and appropriate treatment are essential to prevent permanent nerve damage.

Case Description: A 28-year-old male presented with progressive weakness in both legs, numbness and tingling in hands and toes for 3 months before hospital admission. Upper limb motor strength was 4455/5544, and lower limbs were 4444/4444 and sensory deficits showed stocking and glove pattern. Nerve conduction showed demyelination with axonal degeneration in both motor and sensory nerves of all limbs. He was diagnosed with Guillain-Barré Syndrome and treated with oral steroids, which caused moon face. Two years later, his leg weakness recurred then pulse steroid therapy and physiotherapy were planned. Muscle wasting was noted in both lower limbs with worsening numbness and motor strength, intravenous immunoglobulin and mycophenolate mofetil were initiated. After twenty-three months starting mycophenolate mofetil, he developed a fungal skin infection. A mild relapse occurred ten months after the first intravenous immunoglobulin, leading to a combined treatment with pulse steroids, physiotherapy, and acupuncture. The patient showed significant clinical improvement and could walk unaided, though mild paresthesia persisted.

Discussion: The main treatment for Chronic Inflammatory Demyelinating Polyneuropathy includes corticosteroids and intravenous immunoglobulin. Long-term corticosteroids use caused moon face despite temporary clinical improvement. [1,2,3] A relapse occurred, prompting the plan to administer intravenous pulse steroids. However, numbness and tingling persisted, leading to a combined treatment of intravenous immunoglobulin and pulse steroids, resulting in significant motor improvement.[4,5,6]

Conclusion: Chronic Inflammatory Demyelinating Polyneuropathy in young adults is uncommon. Combination therapy with intravenous immunoglobulin and pulse corticosteroids demonstrated better clinical outcomes compared to long-term oral steroids, despite higher treatment costs.

Keywords: Chronic Inflammatory Demyelinating Polyneuropathy, Intravenous Immunoglobulin, Pulse Steroid

CASE REPORT OF AUTOIMMUNE BRAINSTEM ENCEPHALITIS (BICKERSTAFF'S BRAINSTEM ENCEPHALITIS) AT DR. HASAN SADIKIN HOSPITAL BANDUNG

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Introduction: Bickerstaff's brainstem encephalitis (BBE) is a rare autoimmune neurological disorder characterized by impaired consciousness, ataxia, and bilateral external ophthalmoplegia. Diagnosis presents a challenge due to symptomatic overlap with other neurological conditions.

Case Description: A 33-year-old male presented with progressive generalized rigidity over three days prior to admission. Neurological examination revealed somnolence, bilateral external ophthalmoplegia, bilateral cranial nerve VII and XII palsies, dysphagia, and symmetric tetraparesis. Laboratory tests showed mild leukocytosis (14,070/µL), elevated creatine kinase (352 U/L), and increased C-reactive protein (17.3 mg/dL). Cerebrospinal fluid (CSF) analysis revealed mild lymphocytic pleocytosis (7 cells/µL), normal protein (16 mg/dL), and normal CSF-to-blood glucose ratio (54%). Anti-NMDAR antibodies were negative. Brain MRI demonstrated bilateral midbrain hyperintensities on T2-FLAIR sequences, and cystic lesions in the bilateral frontoparietal white matter without hemorrhage. The patient was treated with high-dose intravenous methylprednisolone (2 × 500 mg/day for 5 days), followed by tapering oral prednisone and azathioprine. Nosocomial pneumonia was managed with ceftazidime and levofloxacin. Supportive care included patient positioning, oral hygiene, and blood pressure control. By day 10, significant clinical improvement was observed, although cranial nerve palsies and tetraparesis persisted, with motor strength improving.

Discussion: Differential diagnoses included infectious encephalitis, Guillain-Barré syndrome (GBS) variants, and metabolic encephalopathy. BBE is characterized by impaired consciousness, bilateral external ophthalmoplegia, ataxia, and brainstem lesions visible on MRI. In contrast, Miller Fisher syndrome, a GBS variant, primarily affects peripheral nerves, presents with bilateral external ophthalmoplegia but preserves consciousness, and shows normal central nervous system imaging. Definitive diagnosis by detecting anti-GQ1b antibodies in cerebrospinal fluid was unavailable in Indonesia.

Conclusion: Bickerstaff's brainstem encephalitis remains a diagnostic and therapeutic challenge due to its rarity and symptom overlap. Early diagnosis and aggressive immunosuppressive therapy are essential for better neurological outcomes. This case highlights the importance of considering autoimmune causes and supports corticosteroid treatment despite unavailable anti-GQ1b antibody testing.

Keywords: Bickerstaff, Immunotherapy, Pulse corticosteroids, Seronegative encephalitis

AUTOIMMUNE ENCEPHALITIS, THE EEG CHANGES, A CASE REPORT

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Autoimmune encephalitis is an under-reported case due to its many variations of clinical presentation. The incidence is reported between 2.73 to 8.66 cases per 100,000 a year. It is the most common cause of non-infectious encephalitis.

We present the case of a 59 years old diabetic male with altered mental status within days following a course of a viral infection which was then followed with a severe lung infection. Two generalized seizure developt and then delusions, emotion, and mood changes were visible. Neurological examinations showed no other remarkable findings. MRI showed no characteristic findings. Cerebrospinal Fluid exmination showed slight cell increase and slight protein increase. The first EEG examination showed teta waves with the patient fully awake. After high dose corticosteroid EEG examination showed delta waves with no significant clinical changes. After treatment with intravennous immuglobulin EEG examination showed alpha waves and significant clinical improvement.

Autoimmune encephalitis is a challenging case. Requires not only clinical examination but also a complete laboratory work up, neuroimmaging, and neurophysiology examinations. EEG is a valuable tool in patient monitoring and management. Early immunotherapy improves outcome.

Keywords: Autoimmune Encephalitis, EEG

PURE SENSORY GUILLAIN-BARRÉ SYNDROME PRESENTING WITH REFRACTORY NEUROPATHIC PAIN IN A YOUNG WOMAN: A CASE REPORT

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Introduction: Pure sensory Guillain-Barré syndrome (GBS) is a rare variant characterized by acute sensory neuropathy without motor weakness. This report highlights a diagnostically challenging case of sensory GBS with atypical pain-dominant presentation.

Case Discussion: A 24-year-old woman presented with one month of severe, refractory polyneuropathic pain in all limbs, unresponsive to gabapentin and opioids. Neurological examination revealed preserved muscle strength (no paresis) with normal vital sign. Nerve conduction studies demonstrated demyelinating axonal motor-sensory polyneuropathy, despite absent motor symptoms. Plasmapheresis was initiated following admission to the neurology ward. Within 72 hours, pain intensity decreased with complete resolution of sensory symptoms at two-week follow-up.

Discussion: This case illustrates that pure sensory Guillain-Barré syndrome can present with severe, treatment-resistant neuropathic pain in the absence of motor weakness. Electrophysiological studies may reveal demyelinating features even without clinical motor involvement. The patient's improvement after plasmapheresis highlights the potential effectiveness of therapy in pure sensory GBS variant. Early recognition and appropriate intervention are important for optimal outcomes in such atypical presentations.

Conclusion: This case underscores the importance of considering pure sensory Guillain-Barré syndrome in patients with refractory neuropathic pain without motor weakness. Early electrophysiological evaluation and timely plasmapheresis can lead to rapid symptom resolution and favourable outcomes.

Keywords: pure sensory Guillain-Barré syndrome, neuropathic pain, demyelinating polyneuropathy, plasmapheresis

THERAPEUTIC OPTIONS IN PATIENTS WITH REFRACTORY IMMUNE-MEDIATED NECROTIZING MYOPATHY SEROPOSITIVE-SRP: EVIDENCE-BASED CASE REPORT

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Introduction: Idiopathic Inflammatory Myopathy (IIM) is a heterogeneous group of muscle diseases. Immune-Mediated Necrotizing Myopathy (IMNM) is a new subgroup of IIM, often present with severe and progressive proximal muscle weakness, significantly elevated serum Creatine Kinase (CK) levels, and evidence of myofiber necrosis. Patients with IMNM are often refractory, having no significant improvement after conventional immunotherapies. The aim of this case report is to perform an evidence-based case report of patients with refractory anti-SRP IMNM treated with non-conventional immunotherapies.

Case Description: A 46-year-old woman with weakness of the upper and lower extremities predominantly in the groin and shoulder for the last 9 months. Electromyography found myogenic lesions, with signs of active dennervation. Initial CK level 1500 with anti Signal Recognition Particle (SRP) +++. The patient was treated with prednisolone, mycophenolate mofetil, and two cycles of Intravena immunoglobulin but symptoms still fluctuate. The patient then given Rituximab (RTX) for two cycles, until the last follow-up (one month after Rituximab) muscle strength got better and CK levels decreased.

Disscussion: Article searches were conducted on databases available in Scopus, Pubmed, and Springer Link in October-November 2024. Eleven articles were obtained that met the inclusion and exclusion criteria. Of the 11 articles, most of the articles used Rituximab therapy, where other articles used Belimumab, Ofatumumab, Cyclophosphamide, Abatacept, Zilucoplan, and Car-T Cell therapies. Rituximab has a positive impact on clinical and CK levels. Some data support that anti-SRP is mediated by humoral immunity, B cell depletion can be effective and often life saving.

Conclusion: Therapy in Anti-SRP IMNM is very challenging, there are no clear guidelines to their treatment. Our case highlights that RTX may be an effective treatment in Anti-SRP IMNM resistant to steroids and multiple conventional immunotherapies.

Keywords: Idiopathic Inflammatory Myopathy, Anti-SRP Immune-Mediated Necrotizing Myopathy, Rituximab

DIAGNOSTIC CHALLENGE BETWEEN GUILLAIN-BARRÉ SYNDROME AND CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY: A CASE REPORT

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Introduction: Guillain-Barré Syndrome (GBS) and Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) are immune-mediated neuropathies with overlapping clinical and electrophysiological features. Accurate distinction is crucial due to differing treatment and prognosis. However, no specific clinical or laboratory markers reliably distinguish GBS from CIDP at onset.

Case Report: A 67-year-old woman presented with progressive weakness in all four limbs. Symptoms began one week earlier as gait instability, followed by a fall. She had been hospitalized in Bangka for a week before referral. A history of upper respiratory tract infection was noted two weeks prior. Neurological examination revealed flaccid tetraparesis (MRC 1/1 in lower limbs, 2/2 in upper limbs) with reduced deep tendon reflexes and absent pathological reflexes. Nerve conduction studies showed reduced CMAP amplitudes, absent F-waves, and absent SNAPs in multiple nerves, consistent with demyelinating and axonal sensorimotor polyneuropathy. CSF analysis showed albuminocytologic dissociation (protein 74 mg/L; cell count <10/µL). Brain MRI was normal; lumbosacral MRI revealed only degenerative spine changes with no acute pathology. She was initially diagnosed with GBS. IV methylprednisolone showed no significant improvement. IV immunoglobulin (2 g/kg over 5 days) was started on day 2 of hospitalization, resulting in modest improvement in limb power. She remained unable to mobilize independently. She was discharged with oral prednisone, which improved strength but was discontinued due to suspected melena. Her motor function declined seven weeks after onset. On follow-up, she showed functional improvement after reintroducing tapered prednisone and was able to ambulate with a walker.

Discussion: The acute-subacute onset and CSF findings supported GBS. However, partial steroid responsiveness, relapse after cessation, and prolonged progression raised suspicion for a treatment-responsive CIDP variant.

Conclusion: CIDP should be considered in subacute flaccid neuropathies initially suspected as GBS, particularly when symptoms persist beyond four weeks or respond to steroids.

AUTOIMMUNE SENSORIMOTOR POLYNEUROPATHY IN YOUNG ADULT PATIENT WITH HISTORY OF ARTHRITIS

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Introduction: Autoimmune sensorimotor polyneuropathy is a condition characterized by peripheral nerve damage due to an immune response targeting the nervous system, often associated with systemic autoimmune diseases such as arthritis.

Case Description: This case report presents a young adult 21-year-old male patient with a history of rheumatoid arthritis who presented with progressive weakness and numbness in both upper and lower extremities. Neurological examination revealed symmetric distal sensory deficits and decreased muscle strength. Nerve conduction studies (NCS) showed features consistent with axonal and demyelinating. The diagnosis of autoimmune sensorimotor polyneuropathy was established based on clinical findings, supporting investigations, and exclusion of other causes. The patient was treated with oral corticosteroid with oral corticosteroids, alongside management of active arthritis. The patient began to experience motoric improvements after 2 months of therapy.

Discussion: Autoimmune polyneuropathy in the context of systemic autoimmune disease, such as rheumatoid arthritis, may result from aberrant immune-mediated inflammation targeting peripheral nerves. Both demyelination and axonal degeneration may coexist, as seen in this case. Early diagnosis is often challenging due to overlapping symptoms with the underlying systemic disease. Electrophysiological studies play a crucial role in confirming the diagnosis. Immunosuppressive therapy, particularly corticosteroids, remains the mainstay of treatment and can result in significant neurological recovery, especially if initiated promptly. This case underscores the importance of considering peripheral neuropathy in patients with autoimmune diseases who develop new-onset limb weakness or sensory changes.

Conclusion: This report highlights the importance of early recognition and a multidisciplinary approach in managing peripheral nervous system involvement in patients with autoimmune disorders because of the potential for effective treatment to either reverse deficits or slow the progression of disease.

Keywords: Autoimmune, polyneuropathy, axonal, demyelinating, young adult, arthritis

CHRONIC INFLAMMATORY DEMYELINATING POLYRADICULONEURPATHY AS ONE OF THE MANIFESTATIONS OF SYSTEMIC LUPUS ERYTHEMATOSUS

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Background: Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) is a rare condition where the immune system attacks the nerves, leading to damage of the nerve coverings (myelin) and nerve fibers. Diagnosis is based on clinical symptoms and supporting tests to rule out other causes. Treatment aims to prevent relapses, so it is important to understand what factors may trigger them.

Case Presentation: A 35-year-old woman with a history of pregnancy developed repeated episodes of weakness and tingling in all four limbs. She was diagnosed with CIDP and treated with corticosteroids and immunosuppressants. Over two years, she had six relapses, including after tapering her medications. Further evaluation revealed signs of Systemic Lupus Erythematosus (SLE). Her treatment was adjusted to include cyclophosphamide, which helped control her symptoms.

Conclusion: This case highlights a patient with acute-onset CIDP after stopping corticosteroids following dose reduction. Additional immunosuppressive therapy and investigation for other autoimmune conditions were considered. However, since relapses continued with the same pattern, a change in the immunosuppressive treatment was planned.

Keywords: CIDP, Acute-onset CIDP, Immunosuppressants, Corticosteroids

HYPERACUTE GUILLAIN-BARRÉ SYNDROME IN A PATIENT WITH END-STAGE RENAL DISEASE (ESRD): A CASE REPORT

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Introduction: Guillain-Barré Syndrome (GBS) is an acute, immune-mediated peripheral neuropathy characterized by progressive limb weakness and areflexia typically evolves over days to four weeks. Hyperacute GBS, where peak weakness occurs within 48 hours, is rare and potentially life-threatening due to the risk of bulbar involvement. Diagnosis is challenging in patients with ESRD due to overlapping features with uremic polyneuropathy and complexities in treatment selection.

Case Description: A 68-year-old Malay woman with ESRD on regular hemodialysis presented with symmetrical limb weakness, dysphagia, nasal speech, and hypersalivation that progressed rapidly within 24 hours. She had an upper respiratory tract infection two weeks prior. Neurological examination revealed limb weakness with bulbar involvement. Deep tendon reflexes were initially preserved but became diminished as the disease progressed. Sensations remained intact. Serum creatine kinase was normal. Nerve conduction studies showed demyelinating features with conduction blocks. Cerebrospinal fluid analysis revealed no albuminocytologic dissociation, likely due to early lumbar puncture. A diagnosis of hyperacute GBS was made. Plasma exchange (PLEX) was initiated alongside her regular hemodialysis. After three PLEX sessions, she showed marked improvement in limb strength and resolution of bulbar symptoms. Anti-ganglioside antibodies (GM3 IgG, GD1a IgG, GT1b IgG) were later confirmed positive during follow-up.

Discussion: This case highlights the diagnostic complexity of hyperacute GBS, particularly in ESRD patients. The unusually rapid progression, preserved reflexes early in the course, non-specific CSF findings may have delayed the diagnosis. PLEX alongside her regular hemodialysis may have facilitated early recovery in this patient. Although hemodialysis does not remove antibodies directly, it plays a crucial supportive role by removing uremic toxins that may confound uremic neuropathy and maintaining metabolic stability.

Conclusion: This case underscores the importance of considering GBS even in atypical, rapidly evolving presentations. Early recognition, multidisciplinary approach, and timely therapy are vital for favourable outcomes, especially in ESRD patients.

SEVERE LANDRY-GUILLAIN-BARRE STROHL SYNDROME WITH ACUTE KIDNEY INJURY: A RARE CASE REPORT

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Introduction: Guillain-Barre syndrome (GBS) is an acute polyradiculoneuropathy, caused by a dysregulated immune response following an infectious or non-infectious event. Although cardiovascular, respiratory, and gastrointestinal systems are commonly involved secondary to neuromuscular paralysis, renal manifestations are rare. The aim of this case study is to foster the delivery of best practices for evaluation and management of severe GBS with Acute Kidney Injury (AKI).

Case Description: A 41-year-old male, who had been hypertensive for 5 years, was admitted to Neurology with complaints of paraesthesia and weakness of the right lower limb which progressed to the left lower limb over 2 weeks. Other symptoms included fatigue, nausea, vomiting, and oliguria. On examination, he was conscious, cooperative, and afebrile. Pulse rate was 86x/min with a blood pressure of 155/84 mmHg. Neurological examination revealed hypotonia with Grade 2 muscle strength in lower limbs and Grade 4 muscle strength in upper limbs. Generalized areflexia with flexor plantar response was noticed. Sensory and cranial nerve examinations were unremarkable. Methylprednisolone was administrated on admission alongside IVIG for five days, which resulted in clinical improvement. Gradual but slow regression of

symptoms were noted. Twelve days later, the patient recovered sufficiently and was consequently discharged.

Discussion: AKI can occur in cases with severe GBS, particularly in those with dysautonomia, causing high mortality rate. In a study by Khajehdehi et al., six out of seven cases with severe GBS and AKI had dysautonomia and oliguria while being in a hypotensive stat, with a higher mortality rate. AKI developed at the time of presentation might be acute tubular necrosis secondary to dysautonomia. Further detailed evaluation showed massive proteinuria without active urinary sediments and hypoalbuminemia, hence common secondary causes were ruled out and percutaneous renal biopsy was scheduled.

Conclusion: AKI in GBS can be due to acute tubular necrosis secondary to dysautonomia.

Keywords: Guillain Barre Syndrome, Severe, Acute Kidney Injury, Acute polyradiculoneuropathy

TRANSVERSE MYELITIS FOLLOWING DENGUE FEVER INFECTION: A RARE NEUROLOGICAL COMPLICATION

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Introduction: Transverse myelitis is a neurological manifestation that may occur as a complication of dengue infection. It is a rare condition that can develop during or after dengue infection. Badat et al., in a prospective study, included 25 publications involving 2,672 cases of dengue fever. A small proportion (10.8%, 289/2672) experienced neurological complications, of which 2.3% (61/2672) were transverse myelitis. Patients typically present with motor and sensory deficits, particularly in the lower extremities, accompanied by autonomic dysfunction.

Case Description: We report a case of a 21-year-old male who developed progressive paraparesis, along with cramps, sharp pain, and both sensory and autonomic disturbances. He had a preceding history of fever, petechiae, melena, dyspnea, generalized edema, and recurrent seizures, and was diagnosed with dengue shock syndrome. Laboratory results revealed thrombocytopenia, leukopenia, hypoalbuminemia, hyponatremia, and impaired renal function. Thoracic MRI with contrast demonstrated a T2 hyperintense lesion extending from T4–T5 to T11–T12, consistent with transverse myelitis. The patient responded well to corticosteroid therapy, with no need for additional interventions.

Discussion: Although rare, transverse myelitis may occur post-dengue infection, most likely through immune-mediated mechanisms. This case highlights the importance of considering post-infectious neurological complications in patients with a history of viral illness presenting with new-onset neurological symptoms. Timely diagnosis and appropriate management can lead to significant clinical improvement.

Conclusion: Transverse myelitis is a rare but serious neurological complication of dengue infection. Early recognition and appropriate treatment are crucial to achieving optimal clinical outcomes.

Keywords: transverse myelitis, dengue, neurological complication, viral infection

WHEN THE HEART STRIKES THE BRAIN: A PEDIATRIC CASE OF CARDIOEMBOLIC STROKE

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Introduction: In the pediatric population, cardioembolic stroke is an uncommon neurological condition that typically presents with sudden onset. Cardioembolic stroke in children may result from structural cardiac anomalies, such as atrial septal defect or cardiomyopathies, which can predispose to intracardiac thrombus formation and systemic embolization.

Case Description: A 7-year-old girl presented with sudden left-sided body weakness. Motor strength decreased on the left side and central N. VII sinistra paresis was found. Magnetic Resonance Imaging (MRI) showed an early subacute infarct of the right nucleus caudatus and nucleus lentiformis urging and constricting the right anterior cornu lateralis ventricle. Digital Cerebral Angiography showed a picture of stenosis at the distal branches of the Right Middle Cerebral Artery (Rt-MCA) and echocardiography concluded the presence of Atrial Septal Defect and thrombus. The management was dual antiplatelet administration. Patients demonstrated significant clinical improvement following the administration of therapy. Informed consent was obtained from the patient for the publication of this case.

Discussion: Non-contrasted brain MRI is the preferred diagnostic modality for identifying stroke in pediatric patients. The recommended treatment for pediatric cardioembolic stroke includes the administration of low molecular weight heparin (LMWH) or vitamin K antagonists.

Conclusion: Prompt and accurate diagnosis of pediatric cardioembolic due to stroke is critical for optimizing neurological outcomes. Non-contrast brain MRI remains the gold standard imaging modality due to its sensitivity in detecting early ischemic changes. To reduce the risk of recurrence, antithrombotic therapy is advised.

Keywords: Cardioembolic Stroke, Pediatric Stroke, Atrial Septal Defect

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MAJALAH KEDOKTERAN NEURO-SAINS PERHIMPUNAN DOKTER SPESIALIS SARAF INDONESIA