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ABSTRACT BOOK

DEPARTMENT OF NEUROLOGY, FACULTY OF MEDICINE, UNIVERSITAS INDONESIA

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FOREWORD

Thank God for the presence of Allah SWT for His grace and guidance on all of us so that we can publish the abstract book for the 12th Jakarta Neurology Exhibition, Workshop and Symposium (JakNEWS), themed The Art of Neuroscience. This prestigious event was organized by the Department of Neurology FKUI in collaboration with PERDOSSI JAYA in April 2025.

More than a decade since JakNEWS has increasingly developed knowledge and scholarship, especially in neurology. Research articles and case reports are, of course, essential aspects of the knowledge pillar. JakNEWS supports this process by providing a place for all writers to publish their writings and participate in developing knowledge. This book will provide many benefits and add to our knowledge of neurology. Finally, healthy greetings, and see you in success.

Warmest Regards,

Pukovisa Prawiharjo, MD, PhD
Chairman of Organizing Committe

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ID_1 Case Report/Neurologist

Approach to Diagnosis and Management of Cerebral Malaria in Remote Area

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Background

A 15-year-old girl was presented with decreased consciousness for the last four hours. Previously, she had seizures that occurred with an interval of one hour which stopped spontaneously after 15 minutes. After the second seizure, the patient was unresponsive. She also had a fever for 5 days, along with headache, muscle-soreness, and decreased appetite. She did not take any medications during this illness. Neck stiffness, jaundice, spontaneous

Case Summary

She was admitted to the ICU and treated with artesunate, phenytoin, ceftriaxone, and dexamethasone. She had whole-blood transfusions for three days. On the third day, she was fully conscious; therefore, the antimalarial was switched into oral dihydroartemisinin-piperaquine (DHP) and primaquine. On the 5th day, no malarial parasites were found, and she was transferred to the ward with hemoglobin of 10.3 g/dL and platelet of 82.000/µL. She was discharged on the seventh day without any neurological deficits.

Discussion

The manifestation of CM may develop after 2 to 7 days of fever, which is accompanied by an altered level of consciousness and/or coma with other symptoms including rigidity or =

Conclusion

The pathogenesis of CM is due to damaged vascular endothelium caused by parasite sequestration. Immediate treatment is crucial and parenteral antimalarial treatment should be administered for severe malaria, including CM, at least for 24 hours until oral administration can be initiated.

ID_2 Case Report/GP

Diagnostic Approaches to Moyamoya Disease in a Patient with Head Trauma

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Introduction: Moyamoya Disease (MMD) is a chronic cerebrovascular disorder characterized by progressive stenosis and occlusion of the distal internal carotid artery and the proximal segments of the middle and anterior cerebral arteries. This leads to the development of abnormal vascular networks at the base of the skull, resulting in a puff of smoke appearance, which is a hallmark of the disease. This condition leads to reduced cerebral blood flow and a heightened risk of stroke. Early diagnosis through imaging techniques like Digital Subtraction Angiography (DSA) is essential for effective management.

Case Report: A 27-year-old male presented with decreased consciousness after a traffic accident. He was initially assessed with a Glasgow Coma Scale (GCS) score of E1M2V1 and left-sided hemiparesis. Despite undergoing decompressive craniectomy, the patient developed left-sided hemiplegia one week later, which did not correlate with the initial haemorrhagic pattern on CT. DSA revealed stenosis from the C7 segment to the A1-M1 proximal right ICA, and the case was classified as Suzuki stage IV.

Discussion: MMD diagnosis relies on advanced imaging, with DSA being the gold standard for assessing the extent of stenosis and collateral vessel formation. The Suzuki classification system helps determine disease progression and informs treatment decisions. In this case, DSA provided crucial information for diagnosis and management, highlighting the advanced stage of the disease.

Conclusion: This case underscores the importance of early diagnosis in Moyamoya disease, particularly using DSA for accurate staging. Timely intervention is critical to reduce stroke risk and improve outcomes, especially in advanced stages

Keywords: diagnostic; dsa; head injury; moyamoya

ID_3 Case Report/GP

Acute Disseminated Encephalomyelitis in Dengue Infection: An Atypical Manifestation of Expanded Dengue Syndrome

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Background: Dengue Virus (DENV), transmitted by Aedes aegypti and Aedes albopictus mosquitoes, is prevalent in tropical and subtropical regions like Indonesia. While dengue primarily causes flu-like symptoms, neurological complications occur in only about 5% of cases, making them a rare yet significant aspect of the disease. These manifestations highlight the virus's potential to affect the nervous system, underscoring the need for heightened awareness and timely intervention.

Case Summary: A 23-year-old female presented with a 2-day fever, slurred speech, tetraparesis, and facial asymmetry. Laboratory tests confirmed dengue virus infection (positive NS1). A 1.5 T Brain MRI revealed cytotoxic lesions of the corpus callosum, indicating encephalitis. She was treated with standard dengue therapy and high-dose intravenous methylprednisolone (1 g/day) for 5 days. After 7 days of treatment, she was discharged without neurological deficits.

Discussion: ADEM (Acute Disseminated Encephalomyelitis) is an acute demyelinating disorder caused by an immune response following infection or vaccination The prevalence is 0.4–0.8 cases per 100,000 annually. The mechanism is unclear but likely involves transient immune targeting of myelin or self-antigens. Diagnosis relies on clinical and radiological findings, as no specific biomarkers or confirmatory tests exist. ADEM often responds well to high-dose steroids, with favorable long-term outcomes. Treatment for ADEM in dengue includes high-dose steroids, immunoglobulins, and plasma exchange.

Conclusion: Early recognition and appropriate therapy for ADEM in dengue infection can lead to favorable clinical outcomes without neurological deficits.

Keywords: Acute Disseminated Encephalomyelitis, Dengue Infection

ID_4 Research Article/Neurologist

Mean Platelet Volume as a Prognostic Marker for Acute Ischemic Stroke: A Systematic Review and Meta-analysis

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Background: Ischemic stroke, a significant public health concern, causes severe functional impairments. Mean platelet volume (MPV), a marker of platelet activity, is linked to heightened stroke risk and severity. This review evaluates the prognostic value of MPV in predicting functional outcomes in acute ischemic stroke patients.

Methods: A comprehensive search of MEDLINE, Google Scholar, ScienceDirect, and Europe PMC databases was conducted using the keywords MPV, ischemic stroke, and outcome. Cross-sectional, retrospective, and prospective studies from inception to 2024 reporting association of MPV with functional outcomes, measured with modified Rankin scale (mRS), were included. Study quality was assessed using the Newcastle Ottawa Scale (NOS) for cohort studies, Joanna Briggs Institute's (JBI) for cross-sectional study, and GRADE criteriafor certainty assessment. Publication bias was evaluated using funnel plot analysis.

Results: Eleven good-quality studies with 1,696 participants were included, with very low certainty based on GRADE. Pooled results demonstrated significantly lower MPV in the good outcome group than those with poor outcomes (SMD -0.65; 95% CI -1.04, -0.26; p=0.001). Subgroup analysis showed no significant MPV differences in thrombolysis-treated patients. Funnel plot analysis suggested potential publication bias.

Discussion: Increased MPV is related to increased platelet activation, larger clot formation, neuroinflammation, and oxidative stress, which may worsen stroke severity, neuroplasticity, and functional outcomes. Our findings align with existing pathophysiological theories, reinforcing MPV's potential role as a prognostic marker.

Conclusion: MPV could be used as a prognostic marker of acute ischemic stroke, with elevated levels causing poorer functional outcomes. Further studies are warranted to validate its clinical utility.

Keywords: mean platelet volume, acute ischemic stroke, modified Rankin scale, prognosis

ID_5 Research Article/GP

Factors Associated with Seizure Control of Focal Onset Epilepsy Patients in RSUPN Dr. Cipto Mangunkusumo

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Background: Epilepsy is a chronic neurological impairment, affecting millions of people all around the world, including Indonesia, with the prevalence reaching 8,2 per 100.000 people. Focal seizures, which originates from one hemisphere, causes most of epilepsy cases. An effective level of seizure control is needed to improve patients' quality of life. Thus, a study to identify the association between demographic, clinical characteristics, and therapy factors and seizure control of focal onset epilepsy patients to optimalise therapeutic decision is needed.

Method: The research method used is cross-sectional study with data analysis from patients' medical records.

Results: From 117 patients with focal onset epilepsy at RSCM, most patients were female (64 (54.7%)) with a mean age of 37 ± 12.7 years. Most patients (55 (47%)) had good seizure control.

Discussion: Normal MRI images (OR = 1.697; 95% CI: 1.134-2.538, p- value = 0.029) and monotherapy (OR = 1.662; 95% CI: 1.149-2.403, p-value = 0.012) were significantly associated with good seizure control in patients with focal onset epilepsy.

Conclusion: MRI imaging results from the patients' clinical characteristics and the number of anti-seizure medications taken shows a significant association with seizure control of focal onset epilepsy patients. Focal onset epilepsy patients with a good seizure control is associated with normal findings in MRI and monotherapy.

Keywords: clinical characteristics, demographic factors, epilepsy therapy, focal onset epilepsy, seizure control

ID_6 Case Report/GP

Neurocysticercosis with Recurrent Seizure Manifestation: A Case Report

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Background: Neurocysticercosis is a rare parasitic infection of the brain parenchyma caused by Taenia solium. Its clinical manifestations depend on the location, size, number, and stage of development of the cysticerci, as well as the body's immune response to the parasite. Headaches, seizures, and other focal neurological deficits are common in patients with neurocysticercosis.

Case Summary: A 39 year old male presented to the emergency department with generalized seizures. The patient had previously experienced six seizures at home, each lasting one minute, with no other complaints. A contrast-enhanced CT scan of the head revealed a hypodense lesion with calcification inside. The patient was given phenytoin 200 mg twice a day, albendazole 400 mg twice a day, and dexamethasone at an initial dose of 10 mg four times a day, which was then tapered down.

Discussion: Neurocysticercosis is the most prevalent neuroparasitic infection worldwide. In Indonesia, this disease is endemic, especially in regions such as North Sumatra, Bali, Papua, Timor, Flores, North Sulawesi, and West Kalimantan. One of the manifestations of neurocysticercosis is seizures. Calcification as a cause of seizure activity and other focal neurological manifestations. Therapeutic management involves both symptomatic and antiparasitic treatment. The antiparasitic drug used for neurocysticercosis is albendazole.

Conclusion: Neurocysticercosis is a preventable cause of seizures in endemic populations. In this case, the diagnosis was made based on clinical history and neuro-radiological findings. The treatment given included symptomatic medications and antiparasitic drugs.

Keywords: Neurocysticercosis, Seizure, Albendazole

ID_7 Research Article/GP

Association Between Migraine and The Risk of Benign Paroxysmal Positional Vertigo: A Systematic Review and Meta-Analysis

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Introduction: Migraine, a common neurological disorder with recurrent headaches and sensory disturbances, is increasingly associated with vestibular dysfunction. Recent evidence links migraine to a higher risk of benign paroxysmal positional vertigo (BPPV), possibly due to shared vascular, inflammatory, or neural mechanisms. The aim of this study was to explore the risk of BPPV in patients with migraine.

Methods: This is a systematic review and meta-analysis based on PRISMA 2020. Databases were searched, including PubMed, ProQuest, ScienceDirect, Wiley Online Library, and SAGE Journal, using predetermined keywords. Risk of bias analysis was done using Risk of Bias In Non-randomized Studies of Exposure (ROBINS-E). Data were extracted, and meta-analysis was done through RevMan 5.4.

Result: Five studies were included, three of which had a low risk of bias, while the remaining two exhibited a "some concerns" risk of bias. This study showed an increased odds of getting BPPV in patients with migraines (odds ratio [OR]: 2.24; 95% confidence interval [CI]: 1.41–3.53; $p<0.0001$; $I^2 = 94\%$). Sensitivity analysis was conducted by excluding three studies, yielding an OR of 2.51 (95% CI: 1.93–3.27; $p<0.00001$) and a decrease in heterogeneity ($I^2=63\%$, $P=0.12$), indicating that the heterogeneity was not statistically significant.

Discussion: Migraine-related vasospasm can cause ischemia in the labyrinthine circulation, potentially resulting in dysfunction of the otolithic organs.

Conclusion: This study suggests that migraine patients have an increased risk of BPPV. Clinicians should be aware of this potential link to facilitate early diagnosis and appropriate management of BPPV in migraine patients.

Keywords: Benign Paroxysmal Positional Vertigo, Migraine, Odds ratio

ID_8 Case Report/GP

Abducens Nerve Palsy with Right-Sided Hemiparesis caused by Multiple Cerebral Cavernoma Malformation: A Rare Case Report

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Background: Cavernomas or cavernous malformations are large and deformed blood vessels that are gathered in clusters. In general, lesions on the abducens nerve are extremely rare.

Case Summary: A Female 30 years old came to emergency room complaining dizziness, headache with feeling numb and muscle weakness around her right side of body for two hours before admission. She was alert, blood pressure 110/80mmhg, respiratory rate 22x/m, heart rate 84 bpm. Neurology examination showed corneal reflex +/+, right abducens nerve palsy +, right sided motoric and sensory weakness, pathological reflex Babinsky -/+ Chaddock -/+, physiology reflex BPR +2/+4 TPR +2/+4 KPR +2/+4. On Computed tomography (CT) of the brain , susp hematoma at pons. On MRI of the brain and revealed a vascular lesion non enhance (popcorn like appearance) lesion at pons and left temporal caused of cavernous haemangioma-based type II Zabramski Classification.

Discussion: Magnetic resonance imaging (MRI) is more sensitive in comparison with computed tomography (CT) and angiography in detecting cavernous malformations. Management and follow-up of cavernomas depend on multiple factors such as clinical presentation, comorbid conditions, location of lesion, and haemorrhagic events. When treating brainstem cavernous haemangioma, age at diagnosis and type of surgery, tumor size, and extend of surgical resection are associated with patient outcomes.

Conclusion: Cerebral cavernoma malformations can show a variety of clinical symptoms on the cranial nerves, and one of the rarely encountered symptoms in the brainstem is Abducens nerve palsy. Surgical vs conservative management still has risks and benefit.

Keywords: Cerebral cavernoma malformations, Abducens nerve palsy

ID_9 Case Report/GP

Diagnosing Multiple System Atrophy Using The Movement Disorder Society Criteria 2022: A Case Study

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Background: Multiple system atrophy (MSA) is a rare, sporadic, adult onset, relentlessly progressive neurodegenerative disorder, that is characterized by neural loss and gliosis in multiple areas of the central nervous system. This case shows the benefit of using the 2022 diagnosis criteria from The Movement Disorder Society (MDS) in diagnosing MSA.

Case Summary: A 58-year-old male came with a chief complaint of inability to walk steadily for 3 years. He had urinary incontinence; his family members also spotted that his speech was slurred and difficult to understand. He reported no problem on his sights, hearing, ability of swallowing, ability to smell and taste, and defecate. The physical examination revealed an alert, averagely-built, and coherent man with normal eye movements, muscle strength, and physiological reflexes. He failed the nose-to-finger, heel-to-shin, and pronation-supination test on his left side. The patient got no improvement from levodopa-benserazide. A brain magnetic resonance imaging (MRI) came out with atrophy of pons and middle cerebellar peduncles and a cross-shaped hyperintensity in the pons on T2-weighted composing a hot cross bun sign.

Discussion: The case is classified as a clinically established MSA based on the presence of core and supportive clinical features, MRI marker, and absence of exclusion criteria. Early diagnosis of MSA is important to avoid complications such as fall injuries.

Conclusion: The MDS criteria is a whole clinical criteria; there is no other ancillary examination needed except for a brain MRI. Such clinical criteria should simplify every physician to be able to diagnose MSA in an earlier stage.

Keywords: Multiple system atrophy, diagnosis criteria, parkinsonism, Movement Disorder Society, hot cross bun sign

ID_10 Research Article/GP

Effects of Mind-Body Exercises on Balance and Physical Tolerance in Multiple Sclerosis: A Meta-Analysis of Randomized Controlled Trials

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Background: Multiple sclerosis (MS) affects balance, physical tolerance, and quality of life. Mind-body exercises, including yoga, pilates, and mindfulness, have been proposed as complementary interventions. This meta-analysis evaluates their efficacy compared to control interventions.

Method: A systematic search was conducted in PubMed, ProQuest, EBSCO, SAGE, and Wiley for RCTs from the last decade. Seven RCTs were analyzed using RevMan 5.4. Outcomes included balance (Berg Balance Scale), physical tolerance (Six-Minute Walk Test), and quality of life (MSQoL-54). Standardized mean differences (SMD) with 95% confidence intervals (CI) were computed using a random-effects model.
Result: Balance results showed no significant improvement, favoring pre-exercise (SMD = -1.18, 95% CI: -2.27 to -0.08, p = 0.03) and the control group (SMD = 1.11, 95% CI: 0.13 to 2.08, p = 0.03). Physical tolerance showed a minor improvement favoring the control group (SMD = 0.35, 95% CI: -0.03 to 0.74, p = 0.01). Moreover, quality of life also showed no significant improvement in the post-exercise group (SMD = -0.83, 95% CI: -1.26 to -0.39, p = 0.0002).

Discussion: The findings suggest mind-body exercises do not provide significant benefits for balance, physical tolerance, and quality of life in MS patients. Variability in interventions, sample sizes, and follow-up durations may have influenced outcomes. Standardized protocols and larger studies are required.

Conclusion: Mind-body exercises did not significantly improve balance, physical tolerance, and quality of life compared to controls and post-exercise measurements. Further research is needed to optimize protocols and assess long-term effects.

Keywords: Multiple sclerosis, yoga, pilates, mindfulness, balance, physical tolerance

ID_11 Research Article/GP

Profile of Ischemic Stroke in Daha Sejahtera General Hospital; Epidemiological Study

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Background: Stroke is an acute clinical manifestation resulting from neurological dysfunction in the brain, spinal cord, and retina, either partially or wholly, that persists for ⩾24 hours or causes death due to vascular disorders. Research data indicates that approximately 2.9 million stroke cases are recorded annually, with a prevalence of 10.9 per 1,000 people or about 2.91 million cases each year. Daha Sejahtera Regional General Hospital is the primary referral hospital in Hulu Sungai Selatan Regency, South Kalimantan Province, where ischemic stroke is found to be the fifth most common cause of hospitalization. This study aims to describe the profile of ischemic stroke patients at Daha Sejahtera Hospital.

Method: This descriptive study used a cross-sectional design and a total sampling technique. The study population consisted of ischemic stroke patients treated at Daha Sejahtera Hospital from January to December 2024. The data were primary, including patient identity and risk factors.

Results: A total of 36 ischemic stroke patients were identified during the January-December 2024 period. Male patients accounted for 36.11% and female patients 63.89%. Half of the patients were aged above 60 years, and the other half were below 60 years. Hypertension was the most common risk factor (77.77%), followed by coronary heart disease and smoking habits.

Discussion: Hypertension was the most prevalent risk factor among ischemic stroke patients. This study is the first to provide an overview of ischemic stroke in Hulu Sungai Selatan Regency.

Conclusion: This study provides a description of ischemia stroke disease in Hulu Sungai Selatan Regency

Keywords: Profile, Ischemic Stroke, Hulu Sungai Selatan, Epidemiology

ID_12 Case Report/GP

Dry Needling As Adjuvant Therapy In Bell's Palsy Patients: Case Reports In Adolescent And Adult

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Background: Bell's palsy covers 60% of total facial nerve palsy cases and to date, the etiology is still unclear Treatment goals for Bell's palsy include strategies to speed recovery. Dry needling as adjuvant therapy helps in accelerating recovery, is rarely used.

Case Summary: Here we present two cases of Bell's palsy in different age groups, one patient was 17 years old, while the other was 62 years old, experiencing similar severity. Both patients underwent standard treatment and dry needling as an adjuvant therapy. The 17 yo patient completely recovered after four weeks of treatment, while the 62 yo patient fully recovered six weeks after the first treatment

Discussion: Some studies have proven that dry needle treatment is effective by increasing muscle thickness and strength, preventing neuronal death, and lowering peripheral inflammation Studies also revealed that early acupuncture treatment is associated with a lower recurrence risk and a higher cure rate. In our study, the recovery rate in both cases shows that age is associated with the healing process, although the outcome was not significantly different. This result parallels a previous study where age at the time of paralysis was associated with treatment outcome.

Conclusion: Therefore, we conclude that using dry needling as an adjuvant therapy for Bell's palsy is proven effective. More extensive research is needed, to study the differences of dry needle effect in adolescents and adults.

Keywords: Bell's palsy, dry needling, adjuvant therapy

ID_13 Case Report/GP

Epilepsy as a Rare Intracranial Complication of Pansinusitis: A Case Series

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Background: Epilepsy is a condition characterized by recurrent and unpredictable seizures with an underlying mechanism that remains incompletely understood. A hallmark feature is over-synchronized neuronal discharge due to the loss of inhibitory control over glutamatergic neurons, with neuroinflammation being a potential contributing factor.

Case Summary: We report two cases of epilepsy in patients with a history of pansinusitis. A 14-year-old male experienced a first-onset generalized seizure, while a 23-year-old female presented with recurrent focal-to-bilateral seizures. CT scans revealed pansinusitis, predominantly affecting the bilateral frontal sinuses with bilateral osteomeatal complex blockage in one patient, and the maxillary sinuses with an open bilateral osteomeatal complex in the other patient. No evidence of intracranial infection or other epilepsy causes was found, suggesting epilepsy as an intracranial complication (IC) of pansinusitis. One patient was managed with medication, while the other underwent functional endoscopic sinus surgery. (FESS), revealing sinonasal polyps on histology.

Discussion: ICs, including epilepsy, are rare but serious complications of pansinusitis and can lead to disabling neurological sequelae. The most common source of IC is frontal sinusitis, followed by ethmoid, sphenoid, and maxillary sinusitis. ICs occur via direct infection spread through dehiscent bone or through natural pathways, such as the olfactory foramina. Neuroinflammation can activate microglia and trigger reactive astrogliosis, leading to inflammatory cascades, neurotransmitter imbalances, and ion channel dysfunction.

Conclusion: We have presented rare cases of epilepsy as an IC of pansinusitis, highlighting the need for thorough evaluations in epilepsy patients without known intracranial infections, including investigations for other potential infectious sources.

Keywords: Epilepsy, pansinusitis, intracranial infection, neuroinflammation

ID_14 Research Article/GP

Exploring the Potential of Mesenchymal Stem Cells in Traumatic Brain Injury: A Systematic Review of Clinical Trials

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Background: Traumatic brain injury (TBI) remains a significant global health challenge, with limited therapeutic options. Mesenchymal stem cells (MSCs) have emerged as a promising therapeutic due to their neuroprotective and immunomodulatory properties. This review evaluates clinical trials on MSC-based therapies in TBI, focusing on efficacy, safety, and future research directions.

Method: A literature search in PubMed, ClinicalKey, ScienceDirect, and non-indexed sources yielded five articles for critical appraisal. RESULT This study analyzed 248 patients from two randomized control trials (RCTs) and three Clinical Trials (CTs) using the Cochrane Risk of Bias 2 (RoB2) tool. Findings from these studies demonstrate improvement in motor scores, functional independence, cognitive abilities, clinical, and subclinical indexes. Moreover, the adverse effects of MSC therapy are minimal, arising from the procedure itself, such as headaches and dizziness.

Discussion: MSC therapy shows promise in TBI management through multiple mechanisms. Clinical trials report significant improvements in motor and cognitive functions, reduced spasticity, and enhanced overall performance. MSCs promote neural regeneration by secreting neurotrophic factors and differentiating into neuron-like cells, improving motor and cognitive functions. Anti-inflammatory effects are significant, with reductions in pro-inflammatory cytokines, creating a conducive environment for neural repair. Timing is critical, with younger patients and early interventions demonstrating superior outcomes.

Conclusion: MSC therapy has shown effectiveness in the treatment of TBI, demonstrating safety with no dose-limiting toxicity and significant improvements in functional and clinical outcomes. However, further studies are necessary to confirm these findings due to the limitations of several studies with a high risk of bias.

Keywords: Mesenchymal stem cell, traumatic brain injury, clinical trial, efficacy, safety

ID_15 Research Article/GP

Predictors of Mortality in Ischemic Stroke Patients: A Report from A Peripheral Hospital in Indonesia Without Access to Thrombolysis Therapy

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Background: Despite its significant impact, there is limited research on predictors of mortality in ischemic stroke patients in developing countries, particularly in peripheral settings. This study aims to evaluate the characteristics of ischemic stroke patients and identify predictors of in-hospital mortality in our hospital.

Methods: This retrospective study included adult ischemic stroke patients admitted to Abdul Aziz Hospital, Indonesia, from January to June, 2024. Diagnoses were confirmed via non-contrast CT. Standard care included antiplatelets, neuroprotectants, and high-dose statins; thrombolysis was unavailable due to resource limitations. In-hospital mortality served as the primary outcome, with multivariate logistic regression used to identify independent predictors.

Results: Over the six-month period, 152 patients were included (48% female, mean age 63.84±12.41 years), with in-hospital mortality reported in 32 (21.0%) patients. Bivariate analysis showed that patients who died had significantly higher frequencies of consciousness impairment, systolic blood pressure ⩽140 mmHg, heart rate >100 bpm, oxygen saturation ⩽94%, abnormal leukocyte counts, elevated serum urea and creatinine, and pneumonia. Multivariate analysis identified moderate (aOR 7.413, 95% CI 1.474–37.272, P=0.015) and severe (aOR 13.329, 95% CI 2.355–75.427, P=0.003) reductions in consciousness, elevated creatinine (>1.1 mg/dL; aOR 27.177, 95% CI 3.113–237.243, P=0.003), and pneumonia (aOR 7.735, 95% CI 2.001–29.905, P=0.003) as independent predictors of mortality.

Discussion: In settings without thrombolysis therapy, ischemic stroke remains associated with substantial mortality. Independent predictors of in-hospital mortality include decreased GCS on admission, elevated creatinine levels (>1.1 mg/dL), and pneumonia.
Conclusion: These findings highlight the need for early identification and management of these risk factors to improve outcomes in resource-limited environments.

Keywords: Stroke, mortality, predictors, Indonesia

ID_16 Case Report/GP

Coincidence of Multiple Epidural Intracranial Abscesses and Intracranial Tuberculoma in Patient Tuberculosis Meningitis

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Introduction: Tuberculosis (TB) is an infectious disease caused by Mycobacterium Tuberculosis. Pathological manifestations of TB infection in the central nervous system can be meningitis, encephalitis, myelitis, abscess and tuberculoma. Intracranial Epidural Abscess is a rare case, but is still the third most common focal pyogenic intracranial infection, after brain abscess and subdural empyema.

Case: A 26-year-old male came with complaints of headache that had been getting worse since 1 month. Physical examination found GCS 15, positive meningeal irritation. The results of the head CT scan with contrast found multiple intracranial epidural abscesses, multiple cerebral tuberculoma. During treatment, the patient was given antibiotics Cefotaxime, Metronidazole, Dexamethasone, and Fix drug Combination (FDC). During outpatient treatment, the patient was given Metronidazole therapy 3x500 mg orally for 3 months and FDC.

Discussion: Patients with meningitis, tuberculoma and intracranial abscess have almost the same general symptoms such as fever, headache, changes in level of consciousness. The examination that can differentiate them is a contrast CT scan. Empirical therapy in patients with brain abscesses whose culture and sensitivity are unknown can be given a combination of penicillin or third-generation cephalosporin plus metronidazole. Meanwhile, the principle of treatment for TB meningitis and tuberculoma follows the guidelines for the treatment of extrapulmonary TB.

Conclusion: In cases of central nervous system infection, contrast CT scan examination is highly recommended because it is very sensitive (100%). Long-term use of antibiotics can be an alternative therapy for conditions of multiple central nervous system infections such as in this case.

Keywords: Abscess, Tuberculoma, Meningitis

ID_17 Case Report/GP

Case Report: Extensive Non-Hemorrhagic Stroke

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Background: The leading cause of death and disability worldwide, stroke is a major and emergent brain illness.

Case Summary: A man presented with decreased consciousness of two days duration. It began upon waking. He had a history of uncontrolled hypertension, previous ischemic stroke, smoking, and obesity. He was somnolent, with Broca\'s aphasia and right hemiparesis. Physiological and pathological reflexes were normal; meningeal signs were negative. Laboratory findings: leukocytosis, neutrophilia, and hypercholesterolemia. A head CT scan revealed an acute thromboembolic infarction in the cortex and subcortical white matter of the left frontoparietotemporal lobe, with a midline shift. It also showed evidence of a right cerebral thromboembolic infarction and right cerebral atrophy.

Discussion: Due to limited facilities at the hospital, he was diagnosed with suspected stroke, likely secondary to intracranial atherosclerotic stenosis. Initial management included head-up, oxygenation, maintenance of fluid and nutritional intake, pharmacological interventions, and consideration for surgery. He was started on dual antiplatelet therapy, analgesics, gastroprotectors, and neuroprotectants. He was consulted by a neurosurgeon and subsequently underwent an encephalo-duro-arterio-synangiosis (EDAS) procedure. During the procedure, the donor artery was positioned adjacent to the superficial cerebral artery distal to the intracranial stenosis. Collateral circulation was then encouraged to develop between the donor artery and the adjacent superficial cerebral vessels without direct surgical anastomosis. Postoperatively, he shows improvement in motor function and speech condition.

Conclusion: There are many therapeutic modalities for treating acute ischemic stroke. Correct diagnosis and treatment will improve outcomes and minimize sequelae.

Keywords: Non-hemorrhagic stroke, intracranial atherosclerotic stenosis, EDAS

ID_18 Case Report/GP

Complex Sequelae of TBI: A Case Report on Intracranial Haemorrhage, Seizures, and Suspected Meningitis

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Background: Traumatic brain injury (TBI) is a leading cause of morbidity worldwide with the highest incidence due to traffic accidents in Southeast Asia.

Case summary: A 26-year-old male presented with a decreased level of consciousness and a history of seizures. He was involved in two motorcycle accidents. He experienced three generalized seizures after the first accident and complained of neck pain. Before the accidents, he had no history of seizures. He didn't seek medical evaluation after both accidents and only consumed pain-killers. He then experienced two seizures on the same day and was brought to the ER. Upon admission, he was agitated, GCS E4M5V3, pulse rate 160x/minute, blood pressure 120/60 mmHg, respiratory rate 48x/minute, and febrile at 40.8°C. Neurological examination revealed positive light reflexes with horizontal roving-eye, hyporeflexia, and positive right limb Babinski reflex. Head CT revealed mixed-density bilateral epidural haemorrhage (EDH) primarily on the left posterior fossa, bilateral frontal lobe subarachnoid haemorrhage, right falx cerebri subdural haemorrhage, basilar skull fracture, pneumocephalus, and hemosinus. He was sedated and given intravenous antibiotics, mannitol, and phenytoin.

Discussion: Intracranial haemorrhages are a risk factor for early and late seizures. Seizures deprive the brain of oxygen, worsening secondary injury. Posterior EDH is associated with early seizures and chronicity. Mixed-density hematomas indicate ongoing bleeding. Phenytoin is given for seizure prophylaxis. Complications of TBI include meningitis.

Conclusion: Simultaneous occurrence of concurrent intracranial hematomas and basilar skull fracture is rare. This case highlights the importance of early management to prevent secondary injury.

Keywords: traumatic brain injury, intracranial bleeding, seizures, post-traumatic epilepsy

ID_19 Case Report/GP

Ischemic Stroke Misdiagnosed as Dialysis Disequilibrium Syndrome in a Patient with End-Stage Kidney Disease Undergoing Hemodialysis: Case Report

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Background: Stroke is the second leading cause of death and disability worldwide and primarily contributes to mortality among patients with end-stage kidney disease undergoing hemodialysis. The incidence of stroke in this population is 8–10 times higher, with a ninefold increase in mortality compared to the general population.

Case Summary: A 72-year-old female was transferred to the emergency room after suffering a loss of consciousness during 30 minutes of hemodialysis. Based on clinical evaluation and laboratory findings, the patient was subsequently suspected of having dialysis disequilibrium syndrome. The patient reported weakness in her right-sided extremities upon regaining consciousness on the second day of treatment, which was determined to be grade 2 dextral hemiparesis. A non-contrast head CT scan showed cerebral infarction in the left periventricular white matter region of the anterior cornu, along with multiple lacunar infarctions in the bilateral lentiform nuclei and evidence of cerebral atrophy.

Discussion: Patients with end-stage kidney disease are at increased risk for all stroke subtypes due to multi-mechanisms linking nephropathy with alterations in cerebral perfusion, neurovascular function, and blood vessel integrity. Decreased blood pressure during ultrafiltration can worsen cerebral perfusion impairment, reducing mean cerebral arterial flow velocity in hemodialysis patients, which may lead to ischemic stroke.

Conclusion: Hemodialysis, combined with other factors associated with kidney disease, contributes to the elevation of stroke risk, making stroke diagnosis in this population more challenging and often leading to delays in management. Therefore, early consideration of cerebral ischemia processes is crucial.

Keywords: Stroke, Dialysis Disequilibrium Syndrome, End-Stage Kidney Disease, Hemodialysis

ID_20 Research Article/GP

Association of Caregiver Demographics and Quality of Life in Parkinson's Patients at RSUD dr. Doris Sylvanus

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Introduction : Parkinson's disease has both motor and non-motor symptoms, which cause patients to rely on others for their daily activities.Caregivers are individuals who provide assistance to people who experience limitations and need help because of their illness. This study investigates the relationship between caregiver characteristics and quality of life (QoF) in Parkinson's patients.

Methods: This study uses a cross-sectional design with a descriptive analytic method. A total of 43 Parkinson's patients and their caregivers were selected through purposive sampling. Data collection included personal identification, patient quality of life (PDQ-39), and caregiver knowledge. Bivariate analysis was conducted using the Spearman test.

Results: Based on the results of data analysis, the average QoF for Parkinson's disease patients is 60.46 ± 4.17 with the level of caregivers' knowledge regarding Parkinson's disease still lacking (55.8%). Bivariate analysis with the Spearman test showed there was no relationship between age (p= 0.426), gender (p=0.873), religion (p=0.151), ethnicity (p=0.926), education (p=0.148), occupation (p=0.270), relationship with the patient (p=0.853), duration of caring for the patient (p=0.579), living with the patient or not (p= 0.402) and level of knowledge caregiver (p=0.240) with QoF of Parkinson's patients.

Discussion: This study found no significant relationship between caregiver characteristics and Parkinson's patients' QoF (p>0.05), suggesting other factors like disease severity and healthcare access play a greater role. Despite 55.8% of caregivers having limited knowledge, improving education remains crucial for better patient care.

Conclusion: There is no significant relationship between the characteristics of caregivers and the QoF of Parkinson's patients.

Keywords: Caregivers, Parkinson's Disease, Quality of Life

ID_21 Case Report/GP

Primary Spontaneous Brainstem Hemorrhage Leading To Sudden Cardiopulmonary Death: A Case Report

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Background: Brainstem hemorrhage refers to bleeding that occurs in the pons, pontomedullary junction, pontomesencephalic junction, midbrain, and medulla oblongata. It is an uncommon form of intracerebral hemorrhage, with a prevalence of 5-10% in Indonesia, but it is associated with high mortality due to its critical location affecting vital functions.

Case Summary: A 57-year-old man, without significant personal or family medical history, presented at a private hospital with a severe headache. Initially, he was conscious, with normal blood pressure and a suspected diagnosis of stroke with 12th cranial nerve paresis. Within hours, his condition deteriorated rapidly, progressing to unconsciousness, coma, and cardiopulmonary death within four hours of admission. Computed tomography revealed a brainstem hemorrhage.

Discussion: Primary Spontaneous Brainstem Hemorrhage (PBSH) is a rare but fatal form of stroke, often associated with hypertension, age, and personal living habits. However, in this case, no significant risk factors were identified except for age. The rapid deterioration from full consciousness to death highlights the aggressive nature of PBSH. Factors such as low Glasgow Coma Scale (GCS), tachycardia, hypotension, and the need for mechanical ventilation significantly contribute to poor outcomes. Brainstem hemorrhage leads to respiratory and vasomotor dysfunction, which can cause sudden death. Prompt management of respiratory and circulatory functions is crucial to improve survival chances.

Conclusion: PBSH has a low incidence but high mortality, often leading to sudden death. Early detection and aggressive management of respiratory and circulatory complications are essential in preventing fatal outcomes.

Keywords: Brainstem, Death, Hemorrhage

ID_22 Case Report/GP

Traumatic Brain Injury Induced Young-Onset Parkinson Disease In A Patient: A Case Report

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Background: Parkinson's disease is characterized by a set of symptoms, including tremors, rigidity, akinesia, and postural instability. In some cases, Parkinson's disease can occur at a young age (21–40 years), commonly referred to as young-onset Parkinson's disease. The etiology of this disease is usually genetic or idiopathic. However, in this case report, we suspect that the cause is trauma-related.

Case Summary: This case was recorded in February 2024, involving Mrs. R, a 43-year-old woman who presented with uncontrolled hand movements for the past two months. The patient was diagnosed with Parkinson's disease five years ago at the age of 38, with symptoms including right-hand tremors, difficulty walking, and rigidity in all four extremities. The patient has a history of left head trauma leading to bleeding in 2014 and 2017 due to traumatic brain injury.

Discussion: In this case, we suspect that young-onset Parkinson's disease occurred as a result of head trauma experienced by the patient. Further research is needed to understand the exact mechanisms of head trauma that can lead to Parkinson's disease. Other possible causes, such as genetic factors, seem unlikely since there is no family history of similar complaints.

Conclusion: Young-onset Parkinson's disease in this patient was caused by left-sided head trauma with bleeding in 2014 and 2017.

Keywords: Parkinson's Disease, Young-onset, Dyskinesia

ID_23 Case Report/GP

Characteristics of Stroke Patients at Hanafiah Batusangkar General Hospital, West Sumatera on 2019-2024

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Background: Hemorrhagic transformation is a common and life-threatening complication of acute ischemic stroke. It has been reported in 3-40% of patients with ischemic stroke, with a fairly high mortality rate. Repeated CT imaging studies are necessary to diagnose hemorrhagic transformation because its symptoms and risk factors are similar to those of stroke in general.

Case Summary: An 83-year-old woman was brought by her family with complaints of decreased consciousness, shortness of breath, cough with phlegm, weakness of the left limbs, and slurred speech. The patient had a history of uncontrolled hypertension. Initial examination showed a somnolent level of consciousness, grade 2 hypertension, tachypnea, tachycardia, and decreased motor scale of the left extremities. The results of a head MSCT scan without contrast during admission suggested an infarct stroke. On the 21st day of treatment, the patient experienced clinical deterioration in the form of sudden hypotension and a shift in the level of consciousness from somnolent to soporous. A repeated head MSCT scan suggested a hemorrhagic transformation.

Discussion: Older age, uncontrolled hypertension, and extensive cerebral infarction are the main factors for hemorrhagic transformation in this case. The underlying mechanism is the disruption of the blood-brain barrier (BBB) and significant damage to capillary cells by ischemia, resulting in increased vascular permeability and extravasation of blood into the brain parenchyma. A 24-hour follow-up CT scan is recommended to evaluate for hemorrhagic conversion.

Conclusion: This case highlights the importance of early prediction of hemorrhagic transformation in acute ischemic stroke.

Keywords: Stroke, Characteristics, Ischemic Stroke, Hypertension

ID_24 Case Report/GP

Spinal Cord Injury in Patient with Ossification of the Posterior Longitudinal Ligament

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Introduction: Ossification of the posterior longitudinal ligament (OPLL) is a risk factor for SCI. It is found during imaging studies in approximately 30% of SCI patients. SCI in OPLL patients can lead to neurological morbidity and significant reduction in quality of life if not treated adequately.

Case Report: A 35-year-old female fell from the stairs. The head and neck were not hit during the incident, however patient complained of weakness in all extremities, especially in both legs, which was accompanied by tingling and numbness. Patient's motor strength was 4555/5554+ and 3111/3222. There was also hypoesthesia at C5 level and below. The OPLL was found at level V.C1 through V.Th1, which impinged on thecal sac and spinal cord especially on V.C3 to V.C7. Spinal cord edema was also seen in cervical and lumbar segments. The patient was then given collar neck, intravenous methylprednisolone, and symptomatic treatments. After 1 week of treatment, the patient could stand and walk with assistance. After 2 months of routine physiotherapy, the patient could walk and do activities independently.

Discussion: There are several factors affecting OPLL namely genetic, hormonal, and environmental factors. Increase in osteogenesis-triggering growth factors is also frequently found in OPLL patients. OPLL patients have higher risk of getting SCI during trauma. Pharmacology treatment can be combined with physiotherapy, orthosis usage, or surgery.

Conclusion: Patients with OPLL are at risk of experiencing more severe symptoms in SCI events. Appropriate therapy and management of SCI in OPLL can improve patient morbidity rates.

Keywords: SCI, OPLL, myelopathy

ID_25 Case Report/GP

Stroke-Like Symptoms in Type 1 Sturge-Weber Syndrome: A Case Report

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Background: Sturge-Weber Syndrome (SWS, or Encephalotrigeminal Angiomatosis), is a rare sporadic congenital neurocutaneous disease, characterized by Ipsilateral Leptomeningeal Angioma and Ipsilateral Facial Angioma (port-wine stain). It has an incidence estimated at 1 case in 20,000 to 50,000 persons. Commonly present symptoms are various type of seizure, accompanied by facial angioma.

Case Summary: A 12 Years-old female patient brought to emergency department with recurrent partial seizure with stroke-like symptoms one day prior to hospitalization and port-wine stain on the left Trigeminal nerve dermatome. We discovered that she had been diagnosed with SWS since 18 months of age, Glaucoma since 6 years of age, and she had stopped taking oral Anti-Epileptic Drugs (AED) for 2 months, after seizure-free for the past 2 years under AED. The Head CT scan revealed widening of left Frontal-Parietal-Temporal-Occipital Sulcus and left Parietal-Temporal-Occipital Subcortical Calcification.

Discussion: In Roach Classification, there are 3 Type of SWS. Based on historical findings and clinical form, the patient meets the criteria of Type 1 SWS. The stroke-like symptoms are only found in 33% of all SWS patients. In addition to administering AED for seizure management, aspirin should also be considered to treat stroke-like symptoms experienced by the patients.

Conclusion: SWS is a neurocutaneous disease that can present with triad of Leptomeningeal Angioma, Facial Angioma, and Ocular abnormality. The absence one of components, doesn\'t automatically exclude SWS. One of sign is stroke-like symptoms that can occur in 33% patients. Furthermore, SWS management require multidisciplinary collaboration to improve the patient\'s quality of life.

Keywords: Sturge-Weber Syndrome, Stroke-like symptoms, Roach Classification

ID_26 Case Report/GP

Persistent Hiccup in Supratentorial Infarction with Global Aphasia: A Case Report

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Background: Persistent hiccup is defined as an involuntary contraction involving diaphragm and intercostal muscle that lasting more than 2 days until a month. This condition often associated with cerebrovascular infarction in brainstem region. In contrary, persistent hiccup associated with ischemic stroke in supratentorial region was rarely reported. Here we described a case of persistent hiccup in a patient with global aphasia in acute supratentorial infarction.

Case Summary: Male, 61 years old balinese, right handed, was admitted due to palpitation. In the emergency room, patient developed sudden right-sided weakness and inability to speech. Neurological examination showed right-sided hemiplegia with muscle strength of 1 and global aphasia. EKG showed Rapid Atrial Fibrillation. Non Contrast CT-Scan showed acute cerebral infarction within left middle cerebral artery territory. Afterwards, the patient experiencing hiccup from the time he was in emergency unit until he was discharged and the hiccup lasted for more than 7 days. Patient was treated with anticoagulant and neuroprotectant alongside supportive therapy. Hicccup was treated with oral chlorpromazine.

Discussion: Central hiccup component is believed to lies in the medulla oblongata. While global aphasia is caused by impairment of language center in the dominant supratentorial hemisphere, occurence of hiccups accompanied by global aphasia make a new insight in patophysiology of persistent hiccup in stroke patients.

Conclusion: Persistent hiccups may occur in supratentorial lesions with global aphasia where a large portion of the dominant hemisphere is affected.

Keywords: Persistent Hiccup, Global Aphasia, Supratentorial Infarction

ID_27 Case Report/GP

Subarachnoid Hemorrhage Due to Polycythemia Vera

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Introduction: Subarachnoid haemorrhage is a bleeding in the subarachnoid space of the brain. Symptom of a subarachnoid haemorrhage is a sudden severe headache that reaches maximum intensity within seconds. Etiologies of Subarachnoid haemorrhage are the rupture of a blood vessel aneurysm, but haematological disorders could cause it.

Case Summary: A 40-year-old female came to the ER at Hermina Hospital Serpong with a severe headache. Headache occurred recently. Before that, 3 months ago, the patient had mild to moderate headaches, but now are more intense. Visual analog score is 7. Nuchal rigidity is positive. Brain CT showed a hyperdense in the subarachnoid of the left side parietal and temporal region and also in the right posterior parietal-temporal. Laboratory tests indicated polycythemia. Haemoglobine 21.8 g/dl, Platelets 794.000/uL, Leukosit 14.380/uL, dan Hematokrit 68.6 %. Patient was given nimodipine and underwent phlebotomy.

Discussion : Subarachnoid haemorrhage can happen in patients with haematological disorders like Polycythemia, which increases the viscosity of the blood and reduces blood flow to the brain. Polycythemia is also associated with cerebral haemorrhage due to platelet aggregation, prolonged activated partial prothrombin time and JAK2 V617F mutation, which increases haemorrhage risk. Patient is given nimodipine to prevent vasospasm post bleeding. Patient also undergoes phlebotomy to reduce blood viscosity and hematocrit, which aims to improve blood flow and reduce the risk of further bleeding.

Conclusion : Subarachnoid haemorrhage is one of the complications of polycythemia vera. Early diagnosis with appropriate examination, blood laboratory, Brain CT, and appropriate intervention can lead to improved clinical outcomes and reduce complications.

Keywords: Subarachnoid Haemorrhage, Phlebotomy, Polychitemia Vera

ID_28 Research Article/GP

Potential Utilization of Modified Multitarget CAR-T Cells as an Advanced Immunotherapy for Glioblastoma: A Systematic Review

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Background: Glioblastoma (GBM) is the most common and aggressive malignant brain tumor, characterized by high morbidity and mortality. Standard treatments—surgery, radiotherapy, and chemotherapy—are often ineffective due to tumor heterogeneity and recurrence. Immunotherapy, particularly chimeric antigen receptor T (CAR-T) cell therapy, has emerged as a promising alternative. This systematic review evaluates the potential of modified multitarget CAR-T cells in addressing GBM's challenges.

Methods: A systematic review was conducted following PRISMA 2020 guidelines. Searches in PubMed, ScienceDirect®, ProQuest, EBSCOhost®, SAGE®, ClinicalKey®, and Scopus focused on studies from the past decade. Data were analyzed to assess the efficacy, safety, and feasibility of multitarget CAR-T therapies.
Results: Of 1,512 identified studies, 11 met the inclusion criteria. Findings indicate multitarget CAR-T cells enhance tumor recognition and immune activation, reducing immune evasion. CAR-T designs targeting EGFRvIII, IL13Rα2, HER2, and GD2 exhibited improved cytotoxicity, eradicated tumors, demonstrated long-term memory response, and were able to achieved complete tumor clearance. Studies found that CAR-T cells therapy in GBM enhanced tumor suppression and prolonged survival in glioblastoma patients.

Discussion: Originally developed for hematologic malignancies, CAR-T therapy is expanding to GBM by targeting tumor-associated antigens (TAAs) like CEA, GPC-3, MUC1, VEGFR2, EGFRvIII, IL13Rα2, HER2, and GD2. However, challenges such as the immunosuppressive tumor microenvironment (TME), antigen loss, and limited tumor penetration hinder efficacy. Strategies like multitarget CAR-T cells, immune checkpoint inhibition, and localized delivery methods may improve outcomes.

Conclusion: CAR-T therapy holds potential for GBM treatment, but further research is required to enhance its effectiveness and clinical applicability.

Keywords: glioblastoma, CAR-T cells, immunotherapy

ID_29 Case Report/GP

Combined Opportunistic Infection Between Cryptococcal Meningitis and Tuberculosis in HIV Patient

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Background: Cryptococcus meningitis in HIV/AIDS patient is a leading cause of morbidity and mortality globally. In Indonesia, the prevalence of cyptococcus meningitis is increasing along with the increasing number of HIV patients.

Case Summary: A 29-year-old man came to the hospital with worsening headache, fever nausea and vomiting 4 days prior admission to the hospital . The patient was on Anti-Retroviral Therapy (ART). Scrofuloderma was found in physical examination. Cluster of Differentiation (CD4) cell count was 24 cells/mm^3. From the results of the CT scan, Leptomeningeal enhancement was found in the left right temporooccipital lobe which is a picture of Meningitis cerebri. The results of the lumbar puncture examination revealed positive cryoptococcal antigen. After the diagnosis of cryptococcus meningitis, the patient received fluconazole 800 mg and amphotericin B for 14 days. Following full administration of amphotericin for 14 days, the patient was discharged without sequelae. the patient continue the antifungal therapy orally.

Discussion: we present a case of cryptococcus meningitis. This patient had clinical symptoms of decreased consciousness, persistent headache, fever with nausea and vomiting.CD4 lab results obtained levels of 24 cells / mm^3. Lumbar puncture examination found cryptococcus antigen. The patient began therapy for cryptococcus meningitis with the administration of amphotericin B and fluconazole for 14 days.

Conclusion: Cryptococcus meningitis in HIV patients is a common disease caused by cryptococcus fungal pathogen into the central nervous system. The diagnosis of cryptococcus meningitis confirmed by lumbar puncture, using cryptococcus antigen. Treatment of meningitis is amphotericin B formulation given intravenously for 14 days

Keywords: Cryptococcus Meningitis, HIV/AIDS

ID_30 Case Report/GP

Contralateral Cranial Nerve Palsies By Large Sphenoid Wing Meningioma In Young Adult Women Who Has Had An Active Use Of Injectable Hormonal Contraception: A Rare Case Report

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Background: Meningioma is a primary intracranial tumours that predominantly affect older adults and the female sex and arises from meningothelial (arachnoid) cells (MECs), manifesting with various clinical signs and symptoms, including cranial nerves regarding the affected sites.

Case Summary: We report an uncommon case of a 37-year-old young adult female who has had an active use of injectable hormonal contraception for fifteen years. She presented with loss of consciousness, recurrent morning headaches, right-sided weaknesses, nuchal rigidity, and contralateral cranial nerve palsies, which is a rare case of meningioma. A computed tomography (CT) scan revealed a large mass in the left sphenoid wing suggestive of meningioma, accompanied by wide vasogenic oedema, mass effect, and midline shift. She received a high dose of corticosteroids that gradually tapered off, and her level of consciousness improved to be compos mentis. She was referred to a tertiary hospital; Direct Subtraction Angiography (DSA) and Gross Total Resection (GTR) were done. Histopathological examination showed meningothelial meningioma by World Health Organization (WHO) grade I.

Discussion: The presence of meningioma is large enough for compressing directly together with vasogenic oedema indirectly to the surrounding areas, causing displacement and distortion of adjacent structures that may cause contralateral cranial nerve palsies.

Conclusion: Meningioma could show unfamiliar signs and symptoms, which could be a false sign of a lesion. Hence, careful diagnosis and management are crucial for patient care.

Keywords: Sphenoid Wing Meningioma, Cranial Nerves, Progesterone

ID_31 Case Report/GP

Paraneoplastic Cerebellar Degeneration in a Patient with Cervical Cancer : Case Report

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Background: Paraneoplastic cerebellar degeneration (PCD) is a neurological disorder usually associated with malignancy such breast cancer, lung cancer and lymphoma. The symptoms include ataxia, vertigo, nausea, and vomiting, which are all signs of cerebellum dysfunction. In a rare condition, autoimmune respone can target normal neural tissue caused by paraneuoplastyc syndrome such as PCD.

Case Summary: A 40-year-old female patient came with complaints of feeling weak, accompanied by nausea and vomiting. The patient's speech became slurred and slow, and walking became unstable, which symptoms rapidly progressed. The patient has a history of breast cancer and had completed chemotherapy treatment. Physical examination showed nystagmus, dysarthria, tremors of the tongue and hands, and signs of ataxia.

Discussion: The symptoms experienced by the patient show the possibility of PCD, considering the history of cervical cancer. PCD often occurs as an autoimmune response to a tumor, with clinical signs that can mimic another cerebellar disease. The diagnosis can be made with serological tests for paraneoplastic antibodies and brain imaging to rule out other causes. The treatment of PCD includes management for underlying cancer and immunomodulation therapy to reduce the effect of the autoimmune response.

Conclusion: PCD is a rare neurological condition that should be considered in patients with cancer who experience progressive neurological symptoms. Early diagnosis and appropriate treatment are essential to optimize treatment outcomes. A multidisciplinary approach involving oncologists and neurologists is required in the management of these patients.

Keywords: Ataxia, Breast Cancer, Paraneoplastic cerebellar degeneration

ID_32 Research Article/GP

Beyond Dopamine: The Role of Iron Metabolism and Neuroinflammation in Restless Leg Syndrome

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Background: Although the relationship between iron and RLS is well established, it is still unclear how exactly iron or other components of iron metabolism contribute to RLS. We aimed to explore the effects of iron metabolism and neuroinflammation contributing to RLS pathophysiology and also explore biomarkers for early detection and targeted therapy approaches.

Methods: We systematically reviewed research reports, case reports, and review articles published. We assessed the full texts of four case-control studies and one observational study. All included studies were qualitatively and quantitatively synthesized using critical appraisal from The Newcastle-Ottawa Quality Assessment Scale (NOS) for Case Control Studies.

Result: The quality assessment for studies included showed overall high quality studies. Four case-control studies reported that hepcidin may be a more relevant biomarker of RLS than ferritin, while one study reported that plasma hepcidin's role as a potential diagnostic biomarker of RLS is inadequate. The severity of RLS increases with the value of plasma hepcidin.

Discussion: Ferritin stores iron, representing peripheral iron status, while hepcidin can cross blood-brain barriers (BBB) and regulates iron metabolism in the brain. High hepcidin concentration can resemble "functional iron deficiency" even when iron supplies are adequate. Increased hepcidin's binding to ferroprotein may reduce the quantity of iron available for the central nervous system.

Conclusion: Hepcidin may play a role in the pathogenesis of RLS. The relationship between hepcidin and RLS could possibly be clearer with larger studies and alternative approaches.

Keywords: Restless leg syndrome, Ferritin, Hepcidin, Iron metabolism

ID_33 Case Report/Resident

The Rebound Phenomenon In Mannitol Use For Traumatic Brain Injury

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Background: Traumatic Brain Injury (TBI) often results in elevated intracranial pressure (ICP), requiring osmotherapy such as mannitol to reduce cerebral edema. However, abrupt discontinuation or excessive accumulation of mannitol can trigger a rebound phenomenon, leading to worsened cerebral edema and secondary brain injury. This complication poses challenges in ICP management and can negatively impact neurological outcomes. Understanding the mechanisms, risk factors, and appropriate tapering strategies is crucial to optimizing TBI management.

Case Summary: A 35-year-old man sustained intracranial hemorrhages following a motorcycle accident. During hospitalization, he underwent rapid mannitol tapering while receiving inadequate analgesia with paracetamol and ketorolac. After several days, his headaches worsened, and follow-up CT scans showed increased bleeding and perifocal edema, suggesting rebound cerebral edema.

Discussion: Mannitol rebound is a critical challenge in ICP control, occurring when abrupt withdrawal or excessive accumulation leads to recurrent cerebral edema and worsening ICP. Gradual tapering is essential to prevent rapid fluid shifts, while hypertonic saline may be considered as an alternative in uncontrolled cases. Adequate pain management is also crucial, as certain analgesics and sedatives can influence ICP regulation. Close monitoring of osmotic balance, fluid status, and neurological function is vital in preventing rebound effects and improving patient outcomes.

Conclusion: The rapid tapering of mannitol and inadequate pain management likely contributed to worsening cerebral edema and hemorrhage. Early recognition and appropriate therapeutic adjustments are key to preventing secondary brain injury and optimizing patient outcomes.

Keywords: Mannitol rebound, Traumatic Brain Injury, Intracranial Pressure, Secondary Brain Injury

ID_34 Research Article/GP

Comprehensive Analysis of Histamine-2 Receptor Antagonists on the Risk of Dementia: A Systematic Review of Cohort Studies

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Background: Histamine-2 Receptor Antagonists (H2RA) are widely used to manage upper gastrointestinal diseases (UGID). However, growing concerns have emerged regarding their potential neurocognitive side effect, particularly an increased dementia risk. H2RAs are often preferred over proton pump inhibitors (PPIs) for enhanced therapeutic efficacy in clinical settings.

Method: This research adhered to the PRISMA guidelines to select studies and assess biases. Databases (PubMed, Scopus, and Cochrane) are systematically searched from 2020-2025, and available studies are further evaluated for eligibility and risk of bias using the Cochrane risk of bias assessment tools for non-randomized studies of interventions (ROBINS-I).

Result: Six studies were analyzed, with four cohort studies showing no significant association between H2RA use and dementia risk. However, H2RA use was associated with accelerated cognitive decline in patients with mild cognitive impairment (MCI) and Alzheimer's disease (AD).

Discussion: The anticholinergic effects of H2RAs may contribute to cognitive impairment by disrupting histamine's role in the central nervous system and vitamin B12 absorption. However, the pathophysiological mechanisms remain unclear and the findings across studies are inconsistent. Further randomized controlled trials (RCTs) with larger sample sizes are needed to elucidate the potential long-term effects of H2RAs on cognitive health.

Conclusion: This systematic review found no clear association between H2RA use and an increased risk of dementia, but noted accelerated cognitive decline in MCI and AD patients.

Keywords: Alzheimer's Disease, Cognitive Impairment, Dementia, Gastric Acid-Suppresive Agents, Histamine-2 Receptor Antagonists

ID_35 Case Report/Resident

Anatomical and Pathophysiological Aspects of Chiary Type I Malformation with Syringomyelia in Young Adults: A Rare Case Report

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Background: Chiari type I malformation (CM-I) is closely associated with syringomyelia, which commonly affects the lower cervical or upper thoracic spinal cord. Syringomyelia frequently occurs in patients with CM-I. **Case Summary**: A 43-year-old Balinese man presented with shaky hands that had been progressively worsening for one year. Six months into his symptoms, he noticed hollows developing in both palms and the backs of his hands. Despite these issues, he was still able to manage his daily activities. However, over the past month, he experienced finger stiffness, difficulty grasping objects, and tingling sensations. Physical examination revealed bilateral paresthesia, hypoesthesia, and atrophy of the hypothenar eminence in both hands. An MRI of the cervical spine showed mild cervical spondylosis without spondylolisthesis, prominent cervical syringomyelia, herniation of the cerebellar tonsils (measuring 9.6 mm below the foramen magnum), and a bulging C3-4 disc that was compressing the anterior thecal sac, although there was no spinal canal stenosis.

Discussion: The exact pathophysiology of CM-I is still unclear, yet it is known to significantly contribute to syringomyelia. Several theories have been proposed to explain the relationship between CM-I and syringomyelia.

Conclusion: Understanding the complex anatomy and theories of CM-I with syringomyelia is essential for clinicians to better understand neurological symptoms and make informed treatment decisions. Keywords: Chiary type 1 malformation, Syringomyelia, CM-1

Keywords: Chiary type 1 malformation, Syringomyelia, CM-1

ID_36 Case Report/GP

Stress-induced belly dancer's dyskinesia in a young woman: A rare case report

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Background: Belly dancer's dyskinesia (BDD) is a movement disorder characterized by involuntary and slow writhing, rhythmic contractions of the abdomen. This rarely encountered phenomenon has not been sufficiently explored, with limited evidence regarding its exact pathophysiology, etiology, and treatment. We present a rare case of stress-induced BDD in a 30-year-old female.

Case summary: A 30-year-old female presented with a 2-month history of involuntary abdominal movements that were sudden in onset, approximately lasting 5-10 minutes, with preserved consciousness. Her symptoms were initially precipitated by stress. However, they worsened within the past week during her menstrual period. Past medical history was significant for long-standing anxiety disorder and depression, for which she took vortioxetine 10mg/day, clonazepam 0.75mg/day, and lorazepam 0.5mg/day routinely. Upon examination, undulating and continuous movements of the abdominal wall were observed. She was diagnosed with BDD and treated with an increased dose of clonazepam 1mg/day. Her symptoms significantly improved within three days.

Discussion: Aside from an underlying psychogenic factor, our patient did not have other risk factors for BDD, such as exposure to neuroleptics or history of abdominal trauma. Albeit certain drugs have been reported to induce BDD, the medications she took have never been reported to cause this condition. Thus, it is most likely that her dyskinesia was stress-induced.

Conclusion: Clinicians may not be familiar with BDD due to its infrequency, and the lack of standardized diagnostic and management strategies makes it challenging to diagnose and treat. Therefore, further research and exposure to BDD are imperative.

Keywords: dyskinesia, belly dancer's dyskinesia, movement disorder.

ID_37 Case Report/GP

Recurrence of WHO GRADE 1 Meningioma in 72 year old: A Case Report

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RSUD La Temmamala

Background: Meningiomas are classified into WHO Grade 1 (benign type), WHO Grade 2, and WHO Grade 3. Studies reporting a recurrence rate WHO grade 1 meningioma ranging from 7% to 25%.This case illustrates the clinical presentation and history of the disease leading up to the recurrence of WHO Grade 1 meningioma.

Case Summary: This case presents a 72-year-old woman diagnosed with benign meningioma in 2015, who experienced meningioma recurrence nine years after a successful surgery. A surgical resection was performed on a large-volume convexity parietal meningioma on the left side. Histopathological examination confirmed a meningothelial meningioma (WHO Grade 1).The patient has undergone routine follow-ups annually. In 2024, follow-up imaging was conducted, and an MRI scan of the head revealed a residual mass in the left parietal region with a small volume, indicating recurrent meningioma.

Discussing : Meningioma (WHO Grade 1) primarily occurs due to the benign and slow-growing nature of the tumor. It is more commonly found in women. These benign tumors grow at a slower rate and are less likely to recur after tumor resection. The recurrence rate of Grade 1 meningiomas is lower compared to Grade 2 and Grade 3 meningiomas. Regular follow-up remains necessary for post-surgical meningioma patients, even if histopathological results indicate a benign tumor.

Conclusion: Meningioma after surgery requires close follow-up, especially in meningothelial meningioma, due to its recurrent nature. Analyzing the disease to prevent meningioma recurrence remains a challenge for us.'

Keywords: case report, recurrence of meningioma, Meningioma WHO Grade 1, meningothelial meningioma.

ID_38 Case Report/GP

Road to Cognitive Improvement: Secondary Brain Injury after Subdural Hematoma

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Background: Traumatic brain injury is one of the leading causes of cognitive disability in young individuals. Primary brain injury occurs immediately after the impact, whereas secondary brain injury develops over time.

Case Summary: A 30-year-old male with a right frontotemporoparietal subdural hematoma, following a traffic accident, presented with persistent delirium for 2 weeks. Repeat CT scans revealed secondary brain injury and the evolution of the hematoma into a hygroma. Hygroma evacuation surgery was indicated. After the hygroma evacuation, the delirium ceased, and frontal lobe syndrome became prominent. Once the patient became cooperative, a cognitive assessment was performed. Based on the cognitive test results, the diagnosis was consistent with frontal disinhibition syndrome. The symptoms persisted as the patient developed external hydrocephalus. After bilateral subdural peritoneal shunt placement, the cognitive function showed remarkable improvement, and the patient became fully independent again.

Discussion: Secondary brain injury is suspected in cases of persistent or deteriorating clinical symptoms. In this patient, secondary brain injury occurred as the hygroma expanded bilaterally and increased in thickness. Compression of the prefrontal cortex (PFC) in multiple regions (orbitofrontal, dorsolateral, and ventrolateral PFC) due to hygroma/hydrocephalus was considered the cause of frontal disinhibition syndrome. Transcranial Direct Current Stimulation (tDCS) was prescribed for neuro restoration program.

Conclusion: Recognition of secondary brain injury is as important as that of the primary injury. Proper treatment results in an improvement in cognitive function. A neurorestoration program is indicated.

Keywords: Secondary brain injury; Frontal disinhibition syndrome; Subdural hygroma

ID_39 Case Report/Resident

Case Report: Thrombolysis in Acute Ischemic Stroke Concurrent with Epidural Abscess

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Background: Stroke is a sudden neurological deficit resulting from interrupted cerebral blood flow. Intravenous thrombolysis with recombinant tissue plasminogen activator (r-TPA) is the gold standard for treating acute ischemic stroke. However, only a small proportion (2-8.5%) of patients receive this therapy due to contraindications or delayed presentation beyond the therapeutic window.

Case Summary: We present a 50-year-old Asian male who presented to the emergency department with acute aphasia and right-sided weakness, starting 2 hours prior to admission. He also exhibited slurred speech and an irrelevant response pattern. His medical history included post-traumatic blood clots treated with burr hole surgery and osteoplasty 20 years prior. For the past five years, he had experienced continuous purulent drainage from the left side of his head. Neurological examination revealed a Glasgow Coma Scale (GCS) score of 4X6 (sensoric aphasia), right-sided facial palsy, and hemiparesis, with a National Institutes of Health Stroke Scale (NIHSS) score of 10. Imaging revealed no intracranial hemorrhage but demonstrated a surgical defect, pneumocephaly, soft tissue edema, encephalomalacia, and subarachnoid cysts. The patient was administered intravenous thrombolysis 3 hours and 5 minutes after symptom onset. His NIHSS score improved from 10 to 1 within 24 hours.

Discussion: Ischemic stroke remains a leading cause of morbidity and mortality, with thrombolysis significantly improving clinical outcomes. Despite complications such as an epidural abscess, early diagnosis and careful management can lead to favorable results.

Conclusion: Intravenous thrombolysis is a safe and effective intervention for acute ischemic stroke, even in the presence of an intracranial epidural abscess.

Keywords: Epidural abscess, Intravenous trombolysis, r-TPA, Stroke

ID_40 Case Report/Resident

Challenges in Diagnosing Acute Disseminated Encephalomyelitis (ADEM) in Adults

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Background: Acute disseminated encephalomyelitis (ADEM) is a monophasic inflammatory demyelinating disease often triggered by infection or vaccination. It primarily affects children but can be more severe in adults. ADEM is characterized by acute or subacute encephalopathy and multifocal neurological symptoms, with MRI scans showing multifocal demyelination. This report focuses on diagnosing and managing ADEM in adult patients with MOG antibodies (myelin oligodendrocyte glycoprotein).

Case Summary: A 34-year-old female patient was found unconscious after experiencing weakness in her extremities, which ultimately led to her falling down the stairs while working in Dubai. An MRI revealed multiple demyelinating lesions in both the brain and spinal cord, and antibody testing confirmed the presence of positive MOG antibodies. The patient was diagnosed with Acute Disseminated Encephalomyelitis (ADEM) and received treatment that included intravenous steroid therapy and plasmapheresis, leading to gradual improvement. Upon discharge to Bali, her complaints had lessened, although she still experienced some residual tingling and mild weakness in her left leg. Her ongoing therapy included Gabapentin and vitamin B complex to manage the residual symptoms.

Discussion: Adults with ADEM experience different functional outcomes influenced by decreased brain plasticity due to aging and immune responses. Serologic and imaging findings are essential for establishing ADEM diagnosis and excluding other differential diagnoses.

Conclusion: Diagnosing ADEM in adults is particularly challenging due to clinical differences that may arise. The diagnostic criteria for ADEM are based on the clinical profile, imaging findings, and serology.

Keywords: Acute disseminated encephalomyelitis, adults, diagnostic

ID_41 Case Report/Resident

The Controversy of High-dose Steroid Use in Spinal Cord Injury

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Background: Spinal cord injury (SCI) is a traumatic mechanism which has poor outcome with high mortality rate. Pharmacological approach which often used in SCI is by using steroid in form of high-dose methylprednisolone (MP). The use of high-dose MP has been a controversy for the adverse effects that steroid has. This case report aims to further study the effect and the use of high-dose MP in SCI as recommendation in clinical practices.

Case Summary: A 24-year-old female with lumbar-level injury and 51-year-old male with cervical-level injury were given MP with 24-hour and 48-hour protocol respectively. There was discrepancy in the outcomes between the two patients. The first patient had motor improvement, while the second patient resulted in mortality.

Discussion: Steroid, in this case, MP has been thought to have beneficial effects for its anti-inflamatory and anti-oedema properties in SCI cases. MP is used widely after National Acute Spinal Cord Injury Studies (NASCIS) I, II, III trials. However, recent studies prove lower recommendations or even conclude against the use of MP for its extensive side effects.

Conclusion: There is still on going debate whether steroid has beneficial effects. Its use in SCI cases still need further validation. MP should not be used as a routine treatment, but rather as as an option in SCI management.

Keywords: spinal cord injury, steroid, methylprednisolone

ID_42 Case Report/GP

Spectrum of Movement Disorders : Asterixis associated with Chronic Liver Disease : A Case Report

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Background: Liver disease is a disease with a wide range of symptoms and can lead to various complications. The relationship between movement disorder and liver disease needs to be considered. Movement disorder due to liver dysfunction can be caused by neurological dysfunction with various etiologies such as impaired detoxification of toxic compounds by the liver, liver dysfunction and/or exposure to exogenous drugs or toxins.

Case summary: 44-year-old male patient complained of jerking in the hands and feet. He had a history of hepatic cirrhosis and chronic hepatitis B since 2 years ago, HBSAg (+), splenomegaly and signs of portal hypertension on ultrasound. Neurological examination revealed involuntary movements of manus and pedis dextra sinistra, rhythmic rhythm, medium amplitude (4-5Hz) fast speed, supresibility (-), area of both hands and feet, stereotypic (+), aggravated by moves, improved by rest, resembles involuntary movements flapping tremor or asterixis.

Discussion: Decreased liver function in cirrhotic patients could lead to hepatocerebral degeneration as neurotoxic substances such as ammonia, glutamine, and manganese gain access to the circulation. Those disrupts the communication between astrocytes and neurons, leading to presynaptic dopaminergic dysfunction and loss of postsynaptic dopaminergic receptor, those manifest clinically as cognitive decline and movement disorders, including tremor, parkinsonism, dystonia, chorea, and ataxia.

Conclusion: The central nervous system and liver have significant clinical interactions. Hepatocerebral degeneration needs to be considered in patients with hepatic cirrhosis when presenting with movement disorders. Those include cognitive decline and movement disorders, including tremor, parkinsonism, dystonia, chorea and ataxia

Keywords: Hepatic disease, Movement disorder, Flapping tremor

ID_43 Case Report/GP

Miller Fisher Syndrome in Patient with Sjogren's Syndrome and Pneumonia: a case report

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Background: The patient suffered blurred vision, progressive paraparesis, parasthesia with chronic cough. From Cerebrospinal Fluid (CSF) Analysis and negative MRI signs of stroke, he was diagnosed with Miller Fisher Syndrome (MFS). In the follow-up examination, the patient was diagnosed with Sjogren's Syndrome.

Case Summary: The patient is a 44 year-old man with chronic cough, progressive blurred vision, paraparesis and paresthesia. Neurologic exam was normal apart from deficit in cranial nerve III, VI, IX, X, and weak motoric and sensory function. His radiology showed no signs of cerebrovascular disease. The CSF analysis showed albuminocytologic dissociation, and ANA profile showed reactivity to SSA+. The chest radiology showed infiltrates in both lungs and based on sputum culture, he was infected with Stenotrophomonas Maltophilia. The patient was diagnosed with MFS, Pneumonia, and Sjogren's syndrome. The patient was given Intravenous Immunoglobulin therapy. After the treatment, the patient showed clinical improvement.

Discussion: MFS is a rare variant of Guillain-Barre Syndrome (GBS). GBS is arose from antecedent infection and other autoimmune disease. The patient showed triad of ophthalmoplegia, areflexia and ataxia. He also suffered from Pneumonia and Sjogren's Syndrome. Supportive findings was consistent with diagnosis of MFS.

Conclusion: MFS is a rare variant of GBS. The patient also suffered from pneumonia, a common trigger for GBS. In Indonesia, MFS especially in Sjorgen's Syndrome, is still considered underreported. More research from similar cases might be beneficial.

Keywords: Miller Fisher Syndrome, Pneumonia, Guillain-Barre Syndrome, Sjogren's Syndrome

ID_44 Case Report/GP

Treating Ischemic Stroke With Human Umbilical Cord Mesenchymal Stem Cells: A New Hope For All Stroke Survivor?

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Background: Stroke remains a prevalent neurological disorder worldwide, contributing significantly to morbidity and mortality across diverse populations. Human Umbilical Cord Mesenchymal Stem Cells (hUC-MSCs) has been recognized as a potential therapeutic strategy for neurological disorders, including stroke, due to their regenerative capacity and immunomodulatory effects.

Case Summary: A 53-year-old male was referred to the ER with sudden-onset left-sided weakness persisting for two days. The patient also experienced walking and speech difficulties. Neurological examination reveals left hemiparesis (5/0), positive right Babinski and Chaddock reflex. Additionally, the patient exhibited right-sided upper motor neuron (UMN) facial nerve paresis. Patient's NIHSS score is 11 before treated. The patient is treated with Clopidogrel, Citicoline, and Mecobalamine. In the fourth day of treatment, the patient's received an adjuvant therapy with 30 x 10^6 allogenic hUC-MSCs, repeated with the same dose three weeks later. At three weeks follow-up, the patient showed significant clinical improvement, able to walk independently although his motor strength had not fully recovered. Patient's NIHSS score is 3 after treatment.

Discussion: The administration of hUC-MSCs in stroke appeared to notable improvements in neurological function, particularly in motor recovery and hemiparesis compared to standard stroke treatment alone. hUC-MSCs are thought to exert their therapeutic potential to promote neuroprotection, modulate inflammation, and enhance neural repair.

Conclusion: This case highlights the potential role of hUC-MSCs in enhancing functional outcomes and overall quality of life in stroke patients, emphasizing the need for further research to establish their efficacy and long-term benefits.

Keywords: Human Umbilical Cord Stem Cells, Ischemic Stroke, Neurological Disease

ID_45 Case Report/GP

Cervical Brown-Sequard Syndrome: An Uncommon Stroke Mimic in a 65-Year-Old Woman

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Background: Brown-Sequard Syndrome (BSS) is a rare incomplete spinal cord injury, accounting for 1-4% of cases, caused by hemisection of the spinal cord. When BSS occurs at the cervical level, it can closely mimic a stroke, particularly in patients presenting with sudden motor weakness and sensory deficits.

Case Summary: A 65-year-old female with a history of hypertension and dyslipidemia presented with sudden falls and left-sided weakness. Initially suspected of having a stroke, BSS was diagnosed after physical examination and imaging revealed cervical spinal cord issues. The patient was treated with IV steroids and symptom management. Over five days, motor function improved, and rehabilitation therapy was initiated. The patient was discharged at her own request after significant improvements in motor strength and sensory function.

Discussion: BSS is characterized by ipsilateral motor weakness and loss of vibration and proprioception, with contralateral loss of pain and temperature sensation, due to spinal cord hemisection, often caused by trauma. In contrast, a stroke results in sudden motor weakness and sensory deficits on the same side of the body, due to disrupted blood flow in the brain. The distinct pattern of deficits in BSS differentiates it from a stroke. Treatment includes corticosteroids to reduce spinal inflammation, though their use remains controversial. Rehabilitation therapy is also key to recovery.

Conclusion: Acute hemiparesis in Brown-Sequard syndrome at the C1-C2 level or upper cervical can mimic acute stroke symptoms. Accurate diagnosis through anamnesis, physical examination, and MRI is crucial for distinguishing it from stroke, ensuring appropriate hyperacute management and avoiding unnecessary treatments.

Keywords: Brown-Sequard Syndrome, Stroke Mimic, Spinal Cord Injury

ID_46 Case Report/GP

Adhesive Capsulitis Associated with Metabolic Syndrome: A case report

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Background: Adhesive capsulitis (AC) is a painful shoulder condition in which chronic inflammation of the joint capsule leads to capsular thickening, fibrosis, and adhesion of the capsule to surrounding soft tissue and the anatomical neck of the humerus. This report aims to describe the association between metabolic syndrome, including dyslipidemia, hyperuricemia, and hyperglycemia, with adhesive capsulitis.

Case Summary: A 74-year-old female presented with right shoulder pain for two months before hospital admission. She had no history of trauma. On physical examination, her blood pressure was elevated, joint active range of motion (ROM) was significantly restricted, and the joint was tender upon palpation. Laboratory tests revealed elevated lipid profile and fasting blood glucose levels, including high triglycerides. Radiological examination showed normal findings. The patient received two sessions of prolotherapy injections with D40% and lidocaine. She was prescribed fenofibrate 300 mg twice daily, gabapentin 100 mg twice daily, amlodipine 10 mg once daily, candesartan 8 mg once daily, and vitamins twice daily. After an eight-week follow-up, the pain improved, and joint active ROM was restored.

Discussion: The metabolic syndrome observed in the patient is a significant risk factor for developing adhesive capsulitis. This condition is linked to inflammatory control mechanisms, where connective tissue (CT) fibrosis acts as a storage site for leukocytes and chronic inflammatory cells. However, further research is required to establish a direct correlation between the inflammatory process and the disease.
Conclusion: Metabolic syndrome identified in the patient serve as risk factors for developing adhesive capsulitis.

Keywords: Case report, adhesive capsulitis, metabolic syndrome, dyslipidemia, hyperglycemia

ID_47 Case Report/GP

First Seizure in a 16-Year-Old Girl Associated with Tuberous Sclerosis Complex: A Case Report

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Background: Tuberous sclerosis complex (TSC) is a rare autosomal dominant disorder causing benign tumors in multiple organs. It affects 1 in 6,000 births globally, with a prevalence of 1 in 20,000. However, data in Indonesia remain limited. TSC is marked by seizures, developmental delays, and distinct skin lesions.

Case summary: A 16-year-old girl experienced her first seizure. She had no prior TSC diagnosis. Clinical examination revealed generalized tonic clonic seizure, cognitive impairment, and distinctive skin features, including hypomelanotic macules, angiofibromas, a shagreen patch, and non-renal hamartomas. A non-contrast head CT scan confirmed multiple punctate calcifications in the periventricular regions of both lateral ventricles, consistent with TSC. Diagnosis was delayed until her first seizure.

Discussion: Diagnosing TSC is challenging. Seizures are often the first noticeable sign. Cognitive delays highlight the need for early screening in children with learning difficulties, particularly when TSC symptoms are present. Limited awareness among healthcare providers and the public contributes to delayed diagnosis. Mutations in TSC1/TSC2 genes disrupt the mTOR pathway, leading to abnormal cell growth and hamartoma formation, increasing seizure risk. Raising awareness is crucial for early detection and timely intervention.

Conclusion: TSC often goes undiagnosed until adolescence due to limited awareness and missed early signs. Seizures are a key warning sign requiring evaluation, making TSC a crucial consideration in new-onset seizures, particularly with characteristic skin or brain findings. Early detection and comprehensive care are essential for preventing complications and improving quality of life.

Keywords: Tuberous Sclerosis Complex, TSC, autosomal dominant inheritance, seizure, hypomelanotic macules, ash leaf spots, facial angofibromas, fibrotic plaques, shagreen patches

ID_48 Research Article/GP

Efficacy of Levodopa to Improve Motor Functional Recovery After Stroke : A Systematic Review and Meta-Analysis

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Introduction: Stroke is the leading cause of and disability. Limb hemiplegia severely impacts motor function and quality of life. Currently, Rehabilitation is the only option, however Levodopa could potentially support Motor Function by Dopamine Pathway. This meta-analysis aims to provide clearer insights of effectiveness of Levodopa to improve recovery outcomes for stroke survivors.

Method: Six databases were utilized based on the PICOS framework. The keywords of Levodopa, Stroke, Motor Recovery and their alternatives were used. RoB2 Cochrane risk of bias tool for randomized clinical trials utilized to evaluate included studies. Heterogeneity tests were used and the findings were presented in forest plots with Mean Difference of Barthel Index.

Result: Three studies were included in the analysis with a total sample of 338. There are no significant differences between Levodopa and Control group with Barthel Index evaluation (MD 5.41, 95% CI: -2.42 - 13.24). The Walking duration, NHPT and NiHSS are the parameters used which showed significant differences of motor functional recovery after Levodopa administration.

Conclusion: Levodopa is not statistically significant in improving motoric function after stroke evaluated by Barthel Index. Meanwhile, Levodopa has potential in improving motor functions assessed by Walking Duration, NHPT and NiHSS. However, more clinical trials are required to increase sample size and evaluate risk factors that could play a role in the efficacy of Levodopa in improving motor function.

Keywords: Functional recovery, Levodopa, Motor recovery, Neurological deficit, Stroke.

ID_49 Case Report/Resident

Progressive Multifocal Leukoencephalopathy in Pregnant Women with Newly Diagnosed Human Immunodeficiency Virus

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Background: Progressive multifocal leukoencephalopathy (PML) is a rare disease that is caused by reactivation of John Cunningham Virus (JCV) from family of Polymaviridae especially in patients with human immunodeficiency virus (HIV).

Case summary: Thirty-year-old pregnant woman of 28 weeks gestation age referred to our hospital with complaints of decreased of consciousness that was started with memory impairment that slowly worsens for two months with accompanying intermittent fever and right sided chorea when she was admitted. One month ago, there was right sided weakness that was diagnosed with ischemic stroke. At initial admission, she was diagnosed with newly diagnosed HIV and suspected Cytomegalovirus (CMV) encephalitis with positive IgG CMV, negative toxoplasma, and CD4+ level of 27 cells/μL. The follow up non-contrast brain magnetic resonance imaging showed there were primarily white matter involvement of brain and from cerebrospinal fluid (CSF) sample, there was slight pleocytosis with polymorphonuclear cell predominance and non-reactive polymerase chain reaction CMV (PCR-CMV) and no growth in CSF culture that denotes the patient had possible PML. After that the patient condition worsens, she passed away with septic shock as cause.

Discussion: PML had nonspecific signs such as neurological deficit and cognitive deficit, that some cases were even misdiagnosed as vascular stroke. The prognosis of PML in HIV patients were less favorable. Cases of PML in pregnant woman with HIV was rare and not well documented.

Conclusion: We present cases of possible PML diagnosis in pregnant women with new diagnosis of HIV.

Keywords: Progressive Multifocal Leukoencephalopathy , HIV, pregnancy

ID_50 Case Report/Resident

Growth Hormone Secreting Pituitary Neuroendocrine Tumor with Central Hypothyroidism

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Background: Pituitary neuroendocrine tumors (PitNETs), previously known as pituitary adenomas, are the third most common central nervous system tumors. They are classified as functional and non-functional based on their hormonal activity. Clinical studies suggest that insulin-like growth factor 1 (IGF-1) in growth hormone (GH)-secreting PitNETs stimulates thyroid cell proliferation, leading to hyperthyroidism. In contrast, this case report presents a patient with a GH-secreting PitNET and central hypothyroidism.

Case Summary: A 48-year-old male presented with acromegaly, diplopia, and bitemporal hemianopsia. Magnetic resonance imaging (MRI) of the head revealed a pituitary macroadenoma, classified as Knosp grade IV. Endocrine panel tests showed decreased thyroid-stimulating hormone (TSH) and free thyroxine (FT4) levels, alongside elevated IGF-1 levels. The patient underwent transnasal transsphenoidal endoscopic surgery, and histopathological analysis confirmed a PitNET. He was treated with levothyroxine. MRI evaluation six months post-surgery showed no residual tumor and normalization of FT4 levels.

Discussion: Central hypothyroidism occurs in only 8% of patients with GH-secreting PitNETs. Increased intrasellar pressure from the tumor may compress portal vessels, impairing the delivery of hypothalamic hormones, including thyrotropin-releasing hormone (TRH), to the anterior pituitary. The management of PitNETs requires close collaboration between neurologists, endocrinologists, and neurosurgeons.

Conclusion: The mechanisms underlying central hypothyroidism secondary to PitNETs are not yet fully understood, but compression of portal vessels leading to impaired TRH delivery is a likely cause. Further research and additional case reports are needed to elucidate the pathophysiology of PitNET-associated central hypothyroidism better.

Keywords: pituitary neuroendocrine tumor, hypothyroidism

ID_51 Research Articles/Resident

Demography of Mild Traumatic Brain Injury in the Emergency Department of Dr. Cipto Mangunkusumo Hospital in 2023

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Background: Mild Traumatic Brain Injury (mTBI) comprises the majority of traumatic brain injury (TBI). It is crucial to understand the demographic characteristics in Indonesia to diagnose and treat efficiently, including the preventive measures

Method: A retrospective cohort observational study was conducted using data acquired from the TBI registry, consisting of all adult trauma-code-activated patients in the emergency room of Cipto Mangunkusumo Hospital. Data from January until December 2023 were collected, and variables such as patients' demography, trauma mechanisms, clinical presentations, outcomes, and types of injury were analyzed with SPSS.

Result: Of the total of 331 mTBI patients, 93.35% were patients aged between 17 and 65. The majority were men (70.99%), with mTBI due to traffic accidents (71.29%). The initial vital signs were hypotension (5.13%), bradycardia (1.51%), tachycardia (23.56%), and tachypnea (14.19%). From the physical examination, two patients' showed anisocoric pupils. The patient outcomes were generally favoring recovery, with 41 (12.38%) patients discharged, 44 (13.29%) discharged against medical advice, and 68 (20.54%) hospitalized. Two patients died due to multiple organ failure and septic shock. The injury severity score median was 4 (1-48).

Discussion: The demography of the study is similar to that of the previous research. Although mTBI constitutes the most significant portion of TBI, patients usually present with relatively normal vital signs, isocoric pupils, and relatively good outcomes.

Conclusion: Despite its low mortality rates, most mTBI patients are of productive age, resulting in an increased burden on the patient's family, hospital, and national health insurance. Clinicians must develop targeted prevention for these specific patient groups.

Keywords: demography, mild traumatic head injury, mTBI, concussion

ID_52 Case Report/Resident

Vestibular Schwannoma, Clinical Approach and Management

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Schwannoma is the most prevalent and slow-growing peripheral nerve sheath tumor, frequently affecting cranial nerves, particularly the trigeminal and vestibular. This case report presents a 59-year-old woman who experienced numbness on the right side of her face for four months, along with facial pain and intermittent unilateral headaches of moderate intensity. A neurological examination indicated the involvement of the right-side trigeminal nerve, affecting the ophthalmic, maxillary, and mandibular branches. A brain MRI with contrast revealed a solid extra-axial mass at the right cerebellopontine angle, consistent with a diagnosis of schwannoma. Vestibular schwannoma is the most commonly encountered tumor in the cerebellopontine angle, with hallmark symptoms including vertigo, tinnitus, and hearing loss. In advanced stages, this tumor can lead to trigeminal neuropathy, facial nerve paresis, ataxia, and hydrocephalus due to brainstem compression. Clinical and radiological evaluations are essential for accurate diagnosis and formulation of treatment strategies for schwannoma. Early detection is crucial in preventing further neurological complications and in selecting the optimal therapeutic approach based on tumor progression. Management of schwannoma can be either conservative or surgical. Conservative management entails clinical and radiological monitoring when the tumor growth rate is less than 2 mm yearly. However, in cases with rapid growth or worsening symptoms, surgical intervention becomes the primary option. In this case, the patient underwent surgery performed by a neurosurgical team, with histopathological analysis confirming the diagnosis of schwannoma. Postoperatively, the patient exhibited significant clinical improvement, including reduced facial pain and numbness.

Keywords: Schwannoma, trigeminal neuropathy, cerebellopontine angle, MRI, neurosurgery

ID_53 Research Articles/Resident

Incidence and Factors Associated With Dysphagia in Acute Stroke at Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia

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Background: Dysphagia is a common clinical finding in acute stroke with varying incidence. Identifying associated factors is crucial for prevention and management. This study aims to determine the incidence of dysphagia and its associated factors.

Method: A cross-sectional study was conducted on acute stroke patients at Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia. Dysphagia was assessed using the Gugging Swallowing Screen (GUSS-INA). Demographic data, clinical findings, comorbidities, and imaging were analyzed using bivariate and multivariate analyses.

Result: Dysphagia was found in 14 of 33 subjects (42.42%), with higher incidence in geriatrics (27.3%), categorized as mild (3.03%), moderate (15.15%), and severe (24.24%). All infratentorial strokes (2 subjects) had dysphagia, while 38.71% of supratentorial strokes (12 of 31 subjects) experienced dysphagia. Age, initial National Institutes of Health Stroke Scale (NIHSS) score $\geqslant$10, and stroke location were associated with dysphagia ($p<0.05$).

Discussion: Post-stroke dysphagia incidence aligns with previous study (37–78%). Swallowing function tends to decline with age due to weakening of the oromandibular system, including tongue muscles. Infratentorial stroke has a higher risk of dysphagia because it can disrupt oral sensory function and pharyngeal swallowing phase. Other studies also showed that dysphagia is more likely to be found in more severe strokes, with higher NIHSS scores. However, multivariate analysis showed there is no independent factors in this study.

Conclusion: Dysphagia is common in stroke with incidence 42.42%. Age, stroke location, and initial NIHSS score are associated with dysphagia.

Keywords: Dysphagia, Acute Stroke, Incidence

ID_54 Research Articles/Resident

Normal Values of Indonesian Forehead Sympathetic Skin Response

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Background: Forehead Sympathetic Skin Response (F-SSR) is an electrodiagnostic procedure used to analyze the cholinergic sudomotor sympathetic reflex function. Previous studies have shown the utilization of F-SSR in the early detection of non-motor symptoms in Parkinson's disease (PD). There is no reference of F-SSR normal values in Indonesia, therefore the aim of the study is to obtain F-SSR reference value in the Indonesian population.

Methods: A total of 57 healthy subjects based on history taking and physical examination were enrolled. Forehead SSR examination was conducted using standard guideline method by Shahani et al, 1984 and Knezevic and Bajada et al, 1985. Further data analysis was performed using SPSS ver. 26.0 software.

Results: Most subjects are females (61.4%) with the median age is 30 years old (21-60 years). Thirty subjects (52.6%) exhibited a bilateral response of F-SSR, 4 subjects (7%) had a unilateral response, and 23 subjects (40.4%) had no response. This study obtained 64 values of forehead SSR latency with a mean value of 1.127 ± 0.610 seconds. There was a significant difference in forehead SSR latency values between subjects aged ‹30 years (0.999 ± 0.192 seconds) and those aged ⩾30 years (1.232 ± 0.342 seconds) with p-value= 0.002.

Discussion: Forehead SSR response could be absent in the normal population because it could be affected by examination room temperature, subjects, skin potential level, skin temperature, stimulus strength, subjects alertness, and habituation.

Conclusion: The normal latency values obtained from this study could serve as a reference for forehead SSR examination in Indonesia (1.127 ± 0.610 seconds).

Keywords: sympathetic skin response (SSR); forehead; Indonesia; Parkinson's disease; Non-motor symptoms

ID_55 Case Report/GP

Multiple Intracerebral Hemorrhage as a Possible Presentation of Churg-Strauss Syndrome: A Rare Case Report

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Background: Churg-Strauss Syndrome (CSS) is a rare small-to-medium vessel vasculitis, associated with asthma, eosinophilia, and systemic inflammation. While peripheral nerve involvement is common in CSS, central nervous system (CNS) involvement is rare, with cerebral infarction and encephalopathy being the most frequent. Here, we report a rare case of multiple intracerebral hemorrhage (ICH) thought to be associated to CSS.

Case Summary: A 26-year-old woman with history of asthma and allergic rhinitis presented with an acute headache, worsening a day before admission, accompanied by nausea, vomiting, low-grade fever, and arthralgias. Further investigations revealed multiple cerebral hemorrhage with perifocal edema and partial sulcal enhancements bilaterally. Cerebrospinal fluid (CSF) analysis showed eosinophilic pleocytosis, with elevated Immunoglobulin E (IgE) in the blood test, suggesting cerebral vasculitis by CSS manifested in ICH. Treatment with corticosteroids and immunosuppressant was initiated, leading to a favorable outcome.

Discussion: CSS is a rare systemic disorder characterized by multi-organ vasculitic involvement, though rare, CNS involvement was reported in 6–10% and ICH in association of CSS is extremely rare. The exact mechanism of CSS related cerebral bleeding remains unclear, but may result from cerebral vasculitis during phases of disease activity (indicated by raised inflammatory markers or eosinophilia), as observed in our patient.

Conclusion: This case highlights that, although rare, ICH can be a manifestation of CSS-related vasculitis. Therefore, it should be considered as a differential diagnosis of ICH. In this patient, an immunosuppressive treatment using methylprednisolone and azathioprine led to a favorable outcome, emphasizing the importance of prompt intervention to minimize morbidity and mortality.

Keywords: Churg-Strauss Syndrome, Central nervous system, Intracerebral hemorrhage, Vasculitis

ID_56 Case Report/GP

The Heart-Shaped Sign Infarct: A Rare Case of Bilateral Medial Medullary Infarction

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Background: Medullary infarction is a life-threatening condition with an incidence rate of 0.5-1.5% of all ischemic strokes. It seldom occurs bilaterally and might cause fatal respiratory complications. Here, we present a rare case of Bilateral Medial Medullary Infarct (BMMI) with unique Magnetic Resonance Imaging (MRI) findings and discuss its anatomical involvement.

Case Summary: a 67-year-old man with poorly controlled hypertension and diabetes presented with acute visual impairment, dysphagia, dysarthria, and left hemiparesis since one day before. On the third day post-stroke, the patient developed quadriparesis along with worsening bulbar symptoms. Brain MRI revealed a heart-shaped infarct in the medial medulla, confirming the rare diagnosis of BMMI. The patient was treated with antiplatelet, and there were no further complications.

Discussion: Although rare, clinical findings of bulbar symptoms, quadriparesis, and respiratory involvement may aid early identification of BMMI. Brain MRI is recommended as they reveal the radiological hallmark of a heart-shaped infarct associated with the anteromedial and anterolateral branch of the vertebrobasilar artery that suplies the medullary. MRI is useful in differentiating BMMI from other neurological disorders and determining proper course of treatment.

Conclusion: BMMI early identification with a typical heart-shaped infarct is essential to prevent fatal respiratory failure. Risk factors management is crucial to prevent recurring infarcts.

Keywords: Bilateral medial medullary infarct (BMMI), Heart-shaped sign infarct

ID_57 Research Article/GP

Interlaminar Epidural Steroid Injection As An Effective Treatment for Cervical Radiculopathy Pain: A Case Report from A Peripheral Hospital in Indonesia

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Background: Neck pain is commonly musculoskeletal, but cervical radiculopathy should not be overlooked, particularly in cases with radicular symptoms. Interlaminar epidural steroid injection (ILESI) may provide effective pain relief.

Case Summary: A 45-year-old male presented with chronic neck pain radiating to the right arm for one year, worsening over two days, with a pain intensity of 8-9/10. Cervical X-ray revealed C5-C6 intervertebral disc space narrowing. Initial management with oral and intravenous analgesics, anti-inflammatory medications, and medical rehabilitation did not provide significant relief. On day three, ILESI was performed at the C5-C6 level. With the patient in a prone position, a 23G epidural needle was inserted via a paramedian approach above the inferior lamina until loss of resistance was felt. Three milliliters of contrast were injected to confirm proper epidural placement under fluoroscopy. A combination of 5 mg dexamethasone and 10 mg bupivacaine HCl was administered. By the first post-procedure day, the patient reported significant pain reduction (0-1/10), which persisted through discharge and one-week follow-up.

Discussion: Although not life-threatening, chronic neck pain can lead to significant chronicity and disabilities. This case highlights the effectiveness of ILESI in cervical radiculopathy, offering direct medication delivery into the epidural space under fluoroscopic guidance to increase its effectiveness and associated with fewer systemic side effects than long-term pharmacological therapies. Additionally, ILESI is also less invasive and more cost-effective than surgical options.

Conclusion: ILESI may serve as an effective treatment modality for cervical radiculopathy in patients unresponsive to pharmacological therapy, improving pain and functional outcomes in a minimally invasive manner

Keywords: Cervical radiculopathy, Epidural steroid injection, Interlaminar, Neck pain, Pain intervention

ID_58 Case Report/Resident

Hypersomnia as a Manifestation in Patients Infected with Human Immunodeficiency Virus

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Background: Adults typically require 7-9 hours of sleep per night, and sleep disturbances, such as excessive nighttime sleep, can negatively impact daily life. Patients with HIV are at a 20% higher risk of sleep disorders compared to the general population. Hypersomnia, characterized by excessive daytime sleepiness or prolonged nighttime sleep, is commonly observed in HIV patients, particularly those at the AIDS stage.

Case Summary: A 19-year-old male presented to the emergency department with a 2-month history of fever, a stabbing headache, and seizures. He had a history of pulmonary tuberculosis and was diagnosed with HIV in September 2023, currently undergoing ARV treatment. The patient experienced excessive sleep, reportedly sleeping about 13 hours daily. Family members found it difficult to wake him up when asleep. Epworth Sleepiness Scale and Pittsburgh Sleep Quality Index (PSQI) scores were 11 and 15, indicating abnormal sleepiness and poor sleep quality. He was diagnosed with hypersomnia related to HIV, with further sleep evaluations planned.

Discussion: According to the third edition of the ICSD, hypersomnia due to infection is classified under Central Disorders of Hypersomnolence. Physiologically, sleep is modulated by thalamocortical circuits that regulate the sleep-wake cycle. During early HIV infection, the central nervous system may be affected, altering sleep transitions, while immune system changes can also cause sleep disturbances in people living with HIV.

Conclusion: Sleep disturbances are more common in individuals with HIV, affecting all stages of the disease and contributing to poor sleep quality.

Keywords: Sleep disorders, Hypersomnia, HIV.

ID_59 Case Report/Resident

Alcohol Withdrawal Syndrome with Status Epilepticus in a Patient with Alcohol Use Disorder: A Case Report

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Background: Alcohol Withdrawal Syndrome (AWS) occurs after the abrupt cessation of chronic alcohol consumption and is common in patients with alcohol use disorder (AUD). Symptoms range from mild autonomic disturbances to severe manifestations such as seizures and delirium tremens. Seizures in AWS are particularly concerning, as they can progress to status epilepticus, worsening the prognosis.

Case Summary: A 55-year-old male with a long history of alcohol use disorder and a recent cessation of alcohol intake presented with a gradual decline in consciousness over 36 hours. His Glasgow Coma Scale (GCS) score on admission was E3M5V3. Initial laboratory findings showed elevated liver enzymes (SGOT 654 U/L, SGPT 515 U/L). Despite initial stabilization, the patient experienced generalized tonic-clonic seizures, treated with intravenous diazepam, but seizures recurred. Phenytoin was administered and no further seizures occurred, but the patient's consciousness remained impaired.

Discussion: Seizures in AWS are a result of neurophysiological changes, including glutamate upregulation and GABA receptor inhibition. These changes cause central nervous system hyperactivity, leading to symptoms like seizures, delirium, and autonomic instability. The management of AWS involves prompt seizure control with benzodiazepines and anticonvulsants, as well as supportive care. This case highlights the need for early recognition and management of AWS in patients with alcohol use disorder, especially in those presenting with neurological symptoms.

Conclusion: AWS can lead to serious neurological complications, including status epilepticus. Early detection and appropriate management of AWS are essential. Gradual alcohol reduction under medical supervision, using tapering schedules and pharmacotherapy, helps prevent severe withdrawal complications.

Keywords: Alcohol Withdrawal Syndrome, Seizures, Alcohol Use Disorder, Phenytoin, Diazepam, Status Epilepticus

ID_60 Research Article/GP

Predictors of Functional Recovery in Posterior Circulation Stroke After Mechanical Thrombectomy: A Comprehensive Meta-Analysis

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Background: Posterior circulation stroke (PCS) in the vertebrobasilar system is a severe ischemic stroke with high morbidity and mortality. While mechanical thrombectomy (MT) is effective, factors influencing functional recovery in PCS remain unclear. This study aims to identify key factors influencing functional recovery after MT in PCS.

Method: This meta-analysis included 12 databases on predictors of functional recovery (modified Rankin Scale [mRS] 0–2 at 90 days) after MT. Risk Of Bias In Non-randomized-Studies-of-Exposure (ROBINS-E) was assessed, while meta-analysis was performed using STATA random-effects model to pool odds ratios (ORs) with 95% confidence intervals (CIs), assessing heterogeneity via I^2 and Cochran's Q test.

Result: We analyzed 12,094 patients from 75 studies. Predictors of favorable outcomes included higher posterior circulation-Alberta Stroke Program Early Computed Tomography Score (pc-ASPECTS) (OR=1.80, 95%CI[1.59–2.03],p<0.001,I^2=12.2%),intravenous thrombolysis (OR=1.66, 95%CI[1.31–2.1], p=0.032,I^2=28.6%), first-pass effect (OR=2.36, 95%CI[1.84–3.03],p<0.001,I^2=41.3%), and modified Thrombolysis in CerebralInfarction[mTICI]2b/3 (OR=3.58, 95%CI[2.31–5.55],p<0.001,I^2=37.3%). Poor outcomes were associated with higher baseline National Institutes of Health Stroke Scale(NIHSS) (OR=0.92, 95%CI[0.89–0.95],p<0.001,I^2=47.8%), diabetes mellitus (OR=0.56, 95%CI[0.43–0.72],p<0.001,I^2=22.1%), hypertension (OR=0.73, 95%CI[0.59–0.91],p=0.01,I^2=30.4%), and general anesthesia use (OR=0.56, 95%CI[0.36–0.89],p=0.01,I^2=39.5%).

Discussion: Successful recanalization (mTICI2b/3), lower stroke severity (NIHSS), and good collateral circulation (pc-ASPECTS) strongly predicted better recovery, emphasizing the importance of early intervention. Intravenous thrombolysis and the first-pass effect enhanced recovery, underscoring the need for procedural efficiency. Diabetes, hypertension, and general anesthesia correlated with worse outcomes.

Conclusion: Stroke severity, imaging markers, and procedural success significantly impact recovery in PCS following MT. Optimizing patient selection and EVT strategies can improve outcomes.

Keywords: vertebrobasilar, stroke, thrombectomy, prognosis

ID_61 Case Report/GP

The Challenge in Diagnosing TBM: A Case Report in Non-specific Symptoms Patient

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Introduction: Tuberculous meningitis (TBM) is the most common form of central nervous system tuberculosis and the most severe form of extrapulmonary tuberculosis. TBM diagnosis is challenging due to non-specific symptoms, resulting in delayed treatment, which leads to high morbidity and mortality in over 50% of cases.

Case Summary: A 32-year-old woman was admitted with a loss of consciousness. Other complaints are fever, headache, neck pain, and cough for two weeks. Previously treated at another hospital for typhoid fever; however, symptoms persisted. Physical examination showed neck stiffness and abducens nerve paresis. Laboratory results: leukocytes 11,380/uL and 121.4 mmol/L sodium. Chest X-ray and brain CT were normal. CSF analysis showed positive nonne and pandy, 210 mg/dL protein and 42 mg/dL glucose. The patient was given sodium correction therapy, anti-tuberculosis drugs, antibiotics, and corticosteroids. After 11 days of treatment, the patient was discharged fully conscious, with no headache and neck pain, and improved abducens nerve paresis.

Discussion: Diagnosing TBM is challenging due to its non-specific symptoms. The patient was previously diagnosed with typhoid fever despite having fever, headache, and neck stiffness, which could be symptoms of TBM. Referring to the grading of TBM by BMRC, the patient was a grade 1. Evaluation throughout history taking, physical examination, brain CT, and CSF analysis at our hospital confirmed a diagnosis and treated for grade 2 TBM.

Conclusion: Early identification, diagnosis and initiation of treatment prove challenging in cases of TBM. Appropriate approach is crucial, considering the complications that can cause disability and high mortality rates if treatment is delayed.

Keywords: Meningitis, Tuberculosis, Loss of Consciousness

ID_62 Case Report/Resident

Factors Associated with Poor Outcomes in Pediatrics Medulloblastoma

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Background: Medulloblastoma is a malignant central nervous system tumor in children. Symptoms may be minimal initially but progress very rapidly. Various complications that arise can significantly affect the prognosis of the patient.

Case Summary: A 7-year-old female patient presented with complaints of frequent falls while walking, accompanied by headaches. One month later, the patient was unable to stand, required support while sitting, vomiting, exhibited incoherent speech, and had seizures, with a KPS score of 60 at the time of admission. Head MRI with contrast revealed a solid cystic intraaxial mass in the infratentorial region on the cerebellar vermis, along with narrowing of the fourth ventricle leading to non-communicating hydrocephalus. The patient subsequently underwent tumor resection and VP shunt placement. Histopathological examination confirmed medulloblastoma. During the course of treatment, the patient's condition deteriorated, and the post-surgical KPS score was 10. Three weeks after the procedure, the patient passed away.

Discussion: This is a rare case where the patient initially presented with mild symptoms, followed by a rapid clinical deterioration. Only about five months after the onset of symptoms, the patient passed away. Several studies have mentioned that factors such as tumor location in the posterior fossa, complications due to hydrocephalus, tumor stage, the presence of more than two accompanying symptoms, the surgical procedure, and the KPS score influence patient outcomes.

Conclusion: Medulloblastoma is one of the most common malignant brain tumors in children. The progression of the mass, location, KPS score postoperative, accompanying symptoms, and associated complications determine poor outcomes in patients.

Keywords: Medulloblastoma, Neuropediatric, Neurooncology, Neurosurgery

ID_63 Research Article/GP

The Efficacy of Combining Kirtan Kriya and Kundalini Yoga versus Memory Enhancement Training in Older Adults at Risk for Alzheimer's Disease: A Systematic Review and Meta-Analysis

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Background: By 2050, over 2 billion people will be aged 60 or older. Mild cognitive impairment (MCI) affects 10-20% of elders and raises the risk of dementia, a precursor to Alzheimer's disease (AD). Non-pharmacological therapies like yoga may lower the risk of early-stage AD due to their neuroprotective effects.

Methods: Authors followed PRISMA guidelines across five databases (searched until February 28, 2025) using the keywords "Alzheimer's Disease", "Kirtan Kriya", "Kundalini", "Yoga". Inclusion criteria were Randomized Controlled Trials (RCTs) involving elders at AD risk, comparing Kundalini Yoga and Kirtan Kriya (KY+KK) to Memory Enhancement Training (MET). Non-full texts were excluded. Quality was assessed using Cochrane RoB 2.0, with meta-analysis done using Review Manager 5.4.1.

Results and Discussions: Five RCTs involving 227 participants were included. Hamilton Anxiety Rating Scale (HAM-A) (SMD=-0.56, p=0.009, 95% CI: -0.98 to -0.14) showed KK+KY significantly reduced anxiety. Moods and Feelings Questionnaire-1 (MFQ-1) (SMD=0.62, p=0.0008, 95% CI: 0.26 to 0.99) and Moods and Feelings Questionnaire-2 (MFQ-2) (SMD=0.43, p=0.02, 95% CI: 0.07 to 0.79) indicated MET significantly reduced frequency and seriousness of forgetting. However, Beck's Depression Inventory (BDI) and Connor-Davidson Resilience Scale (CD-RISC) showed insignificant differences ($p>0.05$) in reducing depression and improving resilience. All data were homogeneous ($I2 = 0\%$). Most studies had a low risk of bias, though some had a high attrition bias.

Conclusion: KK+KY reduced anxiety better than MET in older adults at AD risk, while MET improved cognition, particularly in reducing frequency and seriousness of forgetting. Differences in depression and resilience were insignificant. Further research is needed for confirmation.

Keywords: Alzheimer's Disease, Kirtan Kriya, Kundalini, Yoga

ID_64 Case Report/GP

The Role of Hypomagnesemia in Obstetric PRES: A Case Report and Pathological Perspectives

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Background: Posterior reversible encephalopathy syndrome (PRES), identified based on clinical manifestations and imaging, is a severe complication of postpartum eclampsia. Although the pathophysiology remains unclear, emerging evidence suggests that hypomagnesemia may be considered as a contributing factor.

Case summary: A 28-year-old postpartum patient (P1A0) with an unremarkable obstetric history presented to the emergency room with a generalized tonic-clonic seizure accompanied by a headache in the occipital region and vomiting. Vital signs were within normal limits, except for blood pressure was 162/102 mmHg with no altered mental status or neurological deficits. Laboratory findings showed low magnesium levels (1.5 mg/dL; reference range: 1.8 - 3 mg/dL), and a cranial CT scan revealed hypodensity in the bilateral parieto-occipital region. Since the criteria for MgSO4 administration have been met, she was treated with MgSO4 and oral nifedipine. She was discharged on the fourth day of hospitalization.

Discussion: Almost all obstetric PRES patients have a history of eclampsia. A retrospective study showed that the majority of patients with acute obstetric PRES had hypomagnesemia. Low magnesium levels cause the vascular system to become less adaptive in terms of regulating endothelial integrity and vascular tone. In the brain, this condition may increase blood-brain barrier permeability, allowing neurotoxic substances to enter the extravascular space, activate proinflammatory cytokines and disrupt N-Methyl-D-Aspartate receptor (NMDAr) function, thereby increasing neuronal excitability and ultimately leading to seizure induction and vasogenic edema.

Conclusion: This case highlights that hypomagnesemia raises the possibility of playing a significant role in triggering obstetric PRES by affecting blood pressure regulation and NMDAr function.

Keywords: hypomagnesemia, postpartum eclampsia, PRES, seizure, NMDAr, vasogenic edema

ID_65 Case Report/GP

High-Grade Glioma in A 59-Year-Old Male with Stroke Symptom and Seizure Prior To Diagnosis: A Case Report

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Background: Glioblastoma (GBM) is the most malignant type of glioma and accounts for 52% of all primary brain tumors. GBM is classified as a grade IV astrocytoma by the World Health Organization. Recognizing a brain tumor clinically remains a challenge in an emergency setting due to various clinical symptoms, depending on the location and the growth of the tumor, which can lead to a delayed diagnosis.

Case summary: A 59-year-old male was admitted to the emergency room with a chief complaint of being unable to speak accompanied by a focal seizure on his left face. History-taking revealed that the patient had been diagnosed with stroke and epilepsy one year before admission. Laboratory findings showed anemia, leukocytosis, and hyponatremia. A contrast CT scan showed a large (5.03 x 6.92 x 5.52 cm) septate space-occupying lesion with perifocal edema. The patient was treated with a high-dose steroid, dual antibiotic combination, sodium correction, anticonvulsant, and packed red cell transfusion. The patient was then undergoing a tumor removal craniotomy. The biopsy result showed a glioblastoma WHO grade IV. The patient was discharged after 12 days of admission and referred for radiotherapy from the outpatient clinic.

Discussion: A low-grade glioma often shows seizure, while a high-grade glioma often shows progressive neurological deficit symptoms and increased intracranial pressure. Stroke symptoms and seizure prior to glioblastoma diagnosis suggest a course of the disease, indicating a slowly progressive manner, and not a distinct diagnosis.

Conclusion: Recognizing brain tumor clinical symptoms is important to promote early diagnosis of GBM.

Keywords: Brain tumor, glioblastoma, seizure, stroke

ID_66 Research Article/Resident

Glasgow Coma Scale as a Mortality Predictor in Metabolic Encephalopathy: A Multivariate Analysis in a Tertiary Hospital

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Background: Metabolic encephalopathy presents significant clinical challenges due to diverse etiologies and variable manifestations. This investigation aims to analyze the demographic characteristics, etiological spectrum and mortality predictor.

Methods: This retrospective observational study examined 75 subjects with metabolic encephalopathy from January-June 2024. All subjects' documentation was collected throughout their single hospitalization episode until the clinical endpoint of either hospital discharge or in-hospital mortality.

Results: Subjects' gender demographics were similar (49.3% male, 50.7% female) with a mean age of 61±15.49 years. Patients presented 4.48±5.24 days after symptom onset. Initial Glasgow Coma Scale (GCS) scores were distributed equally (mild 37.3%, moderate 29.3%, and severe 33.3%). Hospitalization occurred in general wards (54.7%) or ICU (42.7%). The most common etiologies were septic (41.3%) and uremic (18.7%). Culture-positive infections were identified in 66.7% of tested patients. The overall mortality rate was 70.7% (53/75 patients), while 29.3% (22/75) were discharged for outpatient care. Bivariate analysis demonstrated a significant association between positive cultures and outcomes (p=0.002). However, multivariate logistic regression identified only baseline GCS as an independent factor of mortality (p=0.002, Exp(B)=7.901), while culture positivity (p=0.057), treatment setting (p=0.903), and encephalopathy etiology (p=0.107) were not statistically significant.

Discussion: Our findings identify baseline GCS as the sole independent mortality predictor in metabolic encephalopathy, despite initial associations with culture positivity in bivariate analysis.

Conclusion: Early neurological assessment is crucial in metabolic encephalopathy management.

Keywords: Metabolic encephalopathy, Glasgow Coma Scale, mortality predictor

ID_67 Case Report/Resident

Multiple System Atrophy-Cerebellar Type in a 50 Year Old Male Patient: A Case Report

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Background : Multiple system atrophy (MSA) is a neurodegenerative disease characterized by abnormal deposits of α-synuclein protein in the central nervous system and autonomic nervous system (synucleinopathy), which is progressive and fatal, characterized by autonomic nervous system disorders, parkinsonism unresponsive to levodopa, and cerebellar ataxia.

Case Summary: A 50-year-old male patient came with complaints of walking disorders experienced since 2 years. One year after the onset of symptoms, the patient began to feel tremors in both hands and speech became slurred. In the last six months, the patient easily choked while eating and became increasingly forgetful. On physical examination, orthostatic hypotension, impaired coordination were found, MRI of the head with contrast showed thinning of the pons, medulla oblongata and cerebral peduncle bilaterally accompanied prepontine cysterna and ventricle IV with hot cross bun sign. The patient received a combination therapy of Levodopa 100 mg and Benserazide HCl 25 mg every 12 hours intraorally

Discussion: MSA is classified into two main clinical subtypes: MSA-P (dominant parkinsonian deficits) and MSA-C dominant cerebellar deficits). Pathological features of MSA-C subtype are glial cytoplasmic inclusions (GCI) consisting of misfolded α-synuclein protein in oligodendroglia and neuronal loss that occurs in the striatonigral and olivopontocerebellar systems. Clinically, it appears with gait, eye, speech, and limb coordination disorders accompanied by autonomic disorders.

Conclusion: MSA is a rare degenerative case but can often cause death. Rapid diagnosis and adequate multidisciplinary treatment are needed to prevent worsening of symptoms and improve patient quality of life.

Keywords: Multiple system atrophy, Autonomic dysfunction, Parkinsonism, Cerebellar Ataxia

ID_68 Case Report/Resident

Acquired Partial Lipodystrophy as a Rare Manifestation of Autoimmune Diseases: A Case Series

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Background: Acquired partial lipodystrophy (APL), characterized by progressive partial adipose tissue loss, is associated with paraneoplastic syndromes, drug-related causes, or autoimmune diseases.

Case Summary: Case 1: A 24-year-old Indonesian woman presented with right cheek, buttock and left arm fat loss following left arm panniculitis, accompanied by mild proximal muscle weakness. Hypocomplementemia (C3: 80 mg/dL), positive antinuclear antibodies, elevated anti-dsDNA (174.9 IU/mL), and dyslipidemia were identified. Afterwards, she was diagnosed with systemic lupus erythematosus (SLE). Electromyography (EMG) confirmed myogenic lesions, and MRI demonstrated left triceps brachii and coracobrachialis muscle atrophy with edema. Autoantibody profiling was unavailable. Case 2: A 32-year-old Indonesian woman presented with heliotrope rash and muscle weakness. EMG revealed myogenic lesions without spontaneous activity, alongside hypocomplementemia (C3: 1.23 g/L, C4: 0.3 g/L) and dyslipidemia. After tacrolimus administration, muscle strength normalized, but she developed irreversible symmetrical facial adipose tissue atrophy. She was diagnosed with multiple autoimmune syndrome (MAS; MDA5+ dermatomyositis, anti-CCP-positive rheumatoid arthritis, and localized scleroderma). Fat grafting was planned.

Discussion: Both cases illustrate APL with different fat loss patterns. Case 1 had multifocal fat atrophy highlights SLE-related panniculitis and C3-mediated adipose destruction, while Case 2 reflects MAS-driven diffuse complement consumption (C3 and C4) targeting adipose tissue. Dyslipidemia emphasized systemic impact of adipose loss. Immunotherapy improved autoimmune activity but did not reverse lipodystrophy, necessitating surgical intervention.

Conclusion: Physicians should recognize lipodystrophy clinically, as lipodystrophy can be presenting manifestation or target organ damage in autoimmune diseases. Therefore, autoimmune diseases should be explored after excluding traumatic/iatrogenic causes (e.g., drugs). Once recognized, metabolic complications should be identified

Keywords: Lipodystophy, autoimmune, acquired partial lipodystrophy, myositis

ID_69 Case Report/GP

A Case Report: Fahr's Syndrome Associated with Coronary Artery Disease Following Long-Term Calcium Supplementation in a Post-Total Thyroidectomy Patient

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Background : Fahr's syndrome is a rare neurological disorder with prevalence of less than 1 per one million population, characterized by intracranial calcifications, especially in basal ganglia and dentate nuclei. Parathyroid hormone disturbances are the most common cause of bilateral basal ganglia calcifications. Parathyroid glands injury is an unintended consequence of total thyroidectomy. Administering calcium and activated vitamin D can reduce the incidence of symptomatic postoperative hypocalcemia.

Case Summary : Our patient had history of post-total thyroidectomy in 2013 and has been taking calcium and vitamin D supplementation to reduce the incidence of symptomatic hypocalcemia. Our patient had demonstrated symptoms of carpopedal spasm, headaches, and central vertigo. A Head CT-Scan was performed with findings of bilateral calcifications in the cerebellum, basal ganglia, and parietal lobes, along with findings of CT Coronary Angiography showing vascular calcifications in proximal Right Coronary Artery, raising suspicion of Fahr's Syndrome and its association to Coronary Artery Disease.

Discussion : Brain calcification in hypoparathyroidism has been linked to long duration of hyperphosphatemia and high calcium-phosphate product, which arise from the disease itself and from long-term treatment with activated vitamin D and calcium. High calcium supplementation intake is also linked to a higher incidence of atherosclerosis incident over long-term follow-up. Calcium may contribute to the pathogenesis of Cardiovascular Disease through multiple pathways.

Conclusion : The etiology of Fahr's syndrome is most commonly associated with endocrine disorders. The disease remains incurable but management and treatment methodologies mainly focus on symptomatic relief and elimination of causative variables.

Keywords: Fahr's Syndrome, Hypoparathyroidism, Basal Ganglia Calcification, Coronary Calcification, Calcium Supplementation

ID_70 Research Article/GP

Efficacy, Safety, and Tolerability of Brivaracetam as an Adjunctive Therapy for Refractory Focal Onset Seizure: A Systematic Review and Meta-Analysis of Randomised Controlled Trial

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Background: This study evaluated the safety, tolerability and effectiveness of Brivaracetam (BRV) as an adjunctive therapy for managing focal-onset seizures that are uncontrolled by primary antiseizure medications (ASMs).

Method: This review systematically incorporated studies from databases including PubMed, ProQuest, The Lancet, EBSCO and the Cochrane Library. Study quality was assessed using the Cochrane Risk of Bias 2 tool. Meta-analysis was conducted with Review Manager 5.4.

Result: Seven studies were included, with five qualifying for meta-analysis involving 2,438 patients taking BRV or placebo alongside one or more AEDs. The pooled risk ratios for a 50% reduction in seizure frequency and complete seizure freedom were 1.83 (95% confidence interval of 1.60 to 2.08) and 7.52 (95% confidence interval of 3.59 to 15.75), respectively. In terms of safety, the use of adjunctive BRV was linked to significantly higher rates of somnolence ($p < 0.00001$), dizziness ($p = 0.0001$) and fatigue ($p = 0.0002$), along with other drug-related treatment-emergent adverse effect (TEAEs) such as headache, irritability and nausea. There was no significant difference ($p > 0.05$) between the two groups regarding serious adverse effects (SAEs) or the number of patients who withdrew from the study due to drug-related TEAEs or SAEs.

Discussion: Adjunctive BRV (50-200 mg daily) notably enhanced efficacy outcomes compared to placebo. While mild to moderate side effects occurred, there were no significant differences in SAEs and withdrawal rate, indicating a favorable safety and tolerability profile that aligns with other adjunctive ASMs.

Conclusion: BRV (50–200 mg) is favourable adjunctive therapy for uncontrolled focal-onset seizures.

Keywords: Brivaracetam, Adjunctive therapy, Focal seizure, Treatment outcome

ID_71 Research Article/GP

Tumor Location As An Epileptogenic Factor in Intracranial Tumors: A Cross-Sectional Study

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Background: Epilepsy is frequently the first symptom that prompts the diagnosis of intracranial tumor, occurring in approximately 30-50% of brain tumor patients. This study aims to investigate the determining factors influencing epilepsy as the initial clinical presentation in patients with intracranial tumors.

Methods: This was a descriptive-analytical study with cross-sectional design. Medical record data were collected from 176 patients who met inclusion criteria, diagnosed with intracranial tumors, with or without epilepsy, at Prof. DR. R.D. Kandou General Hospital, Manado. Bivariate and multivariate analyses were conducted to assess relationship between variables.

Results: Mean age of the patients was 52.09 ± 15.16 years, with fewer epilepsy cases (34.7%) compared to non-epilepsy (65.3%). Our analysis revealed significant association between tumor location in frontal, temporal, and infratentorial regions and presence of epilepsy (p0.05). Further multivariate analysis demonstrated significant effect of infratentorial tumor location on epilepsy ($p<0.05$).

Discussion: Tumors in the frontal and temporal lobes frequently cause epilepsy because these regions are involved in complex information processing and have high electrical activity, making them more susceptible to excitation-inhibition imbalances in the presence of intracranial tumors. Increased intracranial pressure from infratentorial tumors can lead to secondary herniation or compression of supratentorial cortical structures, triggering seizures.

Conclusion: Early detection of epilepsy is crucial in brain tumor patients, especially for tumors located in frontal and temporal lobes, as well as infratentorial region.

Keywords: Epilepsy, Intracranial Tumors, Tumor locations

ID_72 Case Report/Resident

Dementia, the Intersection of HIV and Cerebral Toxoplasmosis: A Case Report

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Background: Human Immunodeficiency Virus (HIV) causes cognitive impairment in 40% of patients, while Toxoplasma infection increases dementia risk by 2.8 times.

Case Summary: A 30-year-old woman with a history of stage IV HIV and cerebral toxoplasmosis presented with progressive forgetfulness over the past year. She exhibited cognitive impairments across multiple domains, including attention deficits (perseveration errors on the Random A Letter Test), language disturbances (Animal Naming Test), memory dysfunction (impaired new learning ability), and visuospatial impairment as indicated by abnormal results of Clock Drawing Test and Trail Making Test, along with executive function disturbance. Cognitive tests showed Mini Mental State Examination score of 25/30 and Montreal Cognitive Assessment - Indonesia score of 15/30, indicating cognitive decline. Instrumental Activities of Daily Living test scored 23, suggesting mild dependence, while International HIV Dementia Scale scored 5, warranting further dementia evaluation. Clinical Dementia Rating scale indicated mild dementia (4.5). She was diagnosed with dementia and started on antiretroviral therapy and cotrimoxazole along with cognitive rehabilitation mostly to enhance neuroplasticity.

Discussion: Progressive neurodegeneration accelerates and intensifies dementia, triggered by HIV-related neurotoxicity through neuroinflammation via infected neural cells and toxic viral proteins, while cerebral toxoplasmosis worsens this process by promoting brain abscess formation, inflammation, and neurotransmitter imbalances. Early antiretroviral therapy and cotrimoxazole, which suppress viral replication and toxoplasma infection, aim to support dementia treatment, while neurorestorative strategies remain the mainstay of cognitive recovery.

Conclusion: Rapid cognitive decline in HIV and cerebral toxoplasmosis patients should prompt comprehensive neurobehavioral assessments and combination of neurorestorative strategies with pharmacotherapy.

Keywords: dementia, HIV, Cerebral Toxoplasmosis, neurobehavior, neurorestoration

ID_73 Research Article/GP

Fibrinogen-to-Albumin Ratio Role in Ischemic Stroke: A Prediction Model Meta-Analysis with Dose-Response Analysis

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Introduction: Recently, fibrinogen-to-albumin ratio (FAR) has been proposed as a potential atherosclerotic marker to predict the outcome of thromboembolic disease. However, its use in acute ischemic stroke (AIS) has not been reviewed.

Methods: This review was conducted as per PRISMA 2020 guidance. Literature searching was done in PubMed, Scopus, Web of Science, and Google Scholar. Risk of bias assessment was done using ROBINS-E. The poor clinical outcome, mortality, and stroke recurrence were explored. Subgroup analysis was planned based on the time of blood drawn. To analyse the dose-response relationship of FAR with the AIS, dose-response meta-analysis (DRMA) model was generated with three-knots spline. Diagnostic test accuracy meta-analysis was performed to analyse the performance of FAR to predict the clinical outcome.

Result: Ten eligible articles were included. In meta-analysis, FAR was associated with poor clinical outcome (OR 1.234; 95%CI 1.013-1.502; I2 69.8%). Both on admission and in-hospital day 1 FAR were significant and comparable (OROn admission 2.571; 95%CI 1.353-4.884 vs. ORhospital day 1 2.298; 95%CI 1.200-4.399; pdifference 0.477). DRMA showed a linear relationship of FAR with poor clinical outcome whilst non-linear relationship was observed in mortality. Overall, performance analysis did not support FAR predictive value.

Discussion: In this review, FAR is useful to predict the poor clinical outcome and mortality of AIS patients. Moreover, FAR exhibits a prognostic value as well in acute coronary syndrome, oncology, and COVID-19 as well.

Conclusion: In conclusion, FAR can predict the functional outcome and long-term mortality of AIS cases. FAR also demonstrates a dose-response relationship with functional outcome and mortality.

Keywords: Stroke; Fibrinogen-to-albumin ratio; Prognosis; Meta-analysis; Dose-response meta-analysis

ID_74 Research Article/GP

Deep Brain Stimulation in Refractory Status Epilepticus: A Systematic Review of Case Reports

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Background: International League Against Epilepsy defines status epilepticus (SE) as a seizure lasting more than 30 minutes and may induce an irreversible neuron injury. Unfortunately, some SE may persist more than 24 hour which raises a refractory SE (RSE). Some RSE may resist anti-seizure medication (ASM). Deep brain stimulation (DBS) recently becomes popular in pharmacoresistant epilepsy. Some studies have explored the utility of DBS in RSE. Nevertheless, most of studies are case report and have not been reviewed systematically.

Method: This systematic review has been executed according to PRISMA 2020. PubMed, Scopus, and Web of Science search engines were utilized. The quality of study was assessed with Joann Briggs Institute assessment for case report study. The primary outcome of this review was the seizure control after DBS implantation.

Result: Eight articles were eligible and included in this review yielding 9 cases. All patients were improved, except 1 patient which was in vegetative state. One patient later died after DBS removed. Centromedian nucleus (CMN) of thalamus were the most popular DBS target (6 cases) whilst anterior nucleus (ATN) was the target of 3 cases.

Discussion: As the last-effort treatment for RSE, DBS performs its ability to supress the seizure in most cases. CMN and ATN are the most common stimulated area as both areas have a numerous network to other brain areas.

Conclusion: DBS use in RSE shows a promise outcome, however, since most studies are case report, a robust conclusion cannot be drawn.

Keywords: Refractory status-epilepticus, Super-refractory status epilepticus, Systematic Review, Deep Brain Stimulation

ID_75 Research Article/GP

Dual Role of Magnesium in Migraine: Efficacy & Safety in Treatment and Prevention - A Meta-Analysis of Randomized Controlled Trial

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Background: Magnesium deficiency has been associated with migraines, suggesting its potential as a therapeutic intervention. This meta-analysis assesses the efficacy and safety of intravenous (IV) and oral magnesium for migraine treatment and prevention.

Method: A systematic review following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was conducted across multiple databases for randomized controlled trials (RCT), involving adult migraine patients treated with IV magnesium (1-2g) for acute attacks or oral magnesium (⩾8 weeks) for prevention. Study quality was assessed using the Cochrane Risk of Bias 2 tool, and meta-analysis was conducted with Review Manager 5.4.

Result: Twelve trials were included. IV magnesium showed significant benefits for acute migraines, including better headache response ($p = 0.02$), reduced pain intensity ($p = 0.03$), and less rescue medication use ($p = 0.02$). Oral magnesium was as effective as sodium valproate for prevention but showed limited benefits over placebo for attack frequency ($p = 0.09$). Gastrointestinal side effects were more common with oral magnesium ($p = 0.01$).

Discussion: Magnesium modulates Methyl-D-Aspartate (NMDA) receptors, preventing excessive calcium influx and cortical spreading depression, which are key in migraine pathophysiology. IV magnesium is effective for acute treatment with a favorable safety profile. Oral magnesium shows potential for migraine prevention, with efficacy similar to sodium valproate, though gastrointestinal side effects limit its use.

Conclusion: IV magnesium should be considered for acute attacks, while oral magnesium may be an alternative for prophylaxis in patients intolerant to first-line treatments.

Keywords: Migraine, magnesium, pain reduction, treatment outcome

ID_76 Case Report/GP

Motor Involvement In Varicella-Zoster Virus Reactivation: A Case of Cervical Segmental Zoster Paresis with Electrophysiological Findings

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Background. Herpes zoster (HZ), caused by varicella-zoster virus (VZV) reactivation, primarily affects sensory nerves, but motor involvement—segmental zoster paresis (SZP)—is rare (0.5–5%). Diagnostic delays often occur as weakness is misattributed to reduced voluntary movement rather than underlying neurological impairment. This case highlights VZV-induced cervical paresis and the role of electrophysiology in differentiating it from structural radiculopathy.

Case Summary. A 74-year-old woman developed two weeks of progressive left-hand weakness and pain after a vesicular rash. Examination showed left upper limb flaccid monoparesis, hypothenar atrophy, C7-C8 allodynia, hyperalgesia, and maculopapular lesions with hyperpigmentation. Electrophysiology demonstrated reduced motor and sensory amplitudes, with needle electromyography revealing fibrillations, positive sharp waves, polyphasic motor unit potentials, and increased amplitude in muscles innervated by C5, C7, and C8, consistent with radiculopathy. Cervical spine MRI showed mild degenerative changes and C6 nerve root compression but no C7/8 involvement. The patient was diagnosed with VZV-induced cervical paresis and was treated with valacyclovir, corticosteroids, and multimodal pain management along with physical therapy, with follow-up showing marked clinical improvement.

Discussion. Motor involvement in VZV reactivation is rare and may result from direct viral invasion or immune-mediated inflammation extending beyond sensory ganglia. Electrophysiological studies serve as crucial diagnostic tools in confirming the diagnosis by distinguishing SZP from compressive etiologies. Early recognition and targeted treatment with antivirals, corticosteroids, and rehabilitation may improve outcomes in SZP.

Conclusion. SZP is a rare but significant HZ complications. Early recognition through history, physical examination, and electrophysiology/imaging ensures accurate diagnosis and timely treatment.

Keywords: Segmental zoster paresis, varicella-zoster virus, motor involvement, radiculopathy, electrophysiology.

ID_77 Research Article/GP

Transcranial Direct Current Stimulation to Improve Cognitive Function in Vascular Cognitive Impairment Patient: A Systematic Review

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Background: Transcranial direct current stimulation (tDCS) has demonstrated potential therapeutic benefits for cognitive impairment. While most research focuses on neurodegenerative conditions, evidence on vascular cognitive impairment remain limited. This study aims to evaluate the efficacy of tDCS in enhancing cognitive function in individuals with vascular cognitive impairment.

Method: A systematic search of PubMed, Cochrane, ScienceDirect, and Scopus was performed following PRISMA guidelines. Studies on tDCS for vascular cognitive impairment were included, and the RoB 2 tool was used to assess study quality.

Results: Three trials involving 128 adult patients with cognitive impairment and a history of cerebrovascular disease, primarily stroke, were included. All studies reported significant cognitive score improvements and decreased cognitive process latency following tDCS compared to conservative cognitive therapy. We found tDCS therapy duration ranging from 20-30 minutes, 5-7 sessions per week and last for 2-4 weeks are considered effective. No significant adverse events were observed.

Discussion: Vascular cognitive impairment involves alteration in blood supply, impaired neuronal activity and cognitive deficit. tDCS works by modulating neuroplasticity, primarily in the dorsolateral prefrontal cortex (DLPFC), a region for multiple cognitive functions. This explains why most tDCS is placed on to the DLPFC to enhance cognitive function.

Conclusion: tDCS demonstrated a promising effect in enhancing cognitive function in vascular cognitive impairment, but due to limited data, further research with larger samples is needed.

Keywords: Transcranial Direct Current Stimulation, tDCS, Vascular Cognitive Impairment, Cognitive

ID_78 Research Article/GP

Improvement of Decision-Making and Craving for Drug Symptoms of Methamphetamine Addiction using 10 Hz Repetitive Transcranial Magnetic Stimulation (rTMS) of the Left Dorsolateral Prefrontal Cortex: A Meta-Analysis of Randomized Control Trial (RCT) Studies

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Background: Methamphetamine has emerged as one of the most rapidly increasing psychoactive substances worldwide in recent years. Research has consistently demonstrated that methamphetamine abuse is associated with severe cognitive deficits, including impaired decision-making and drug cravings. Consequently, minimizing cravings could be a key approach in preventing relapse and managing methamphetamine addiction disorder.

Method: A comprehensive search was conducted using PubMed, MEDLINE, Cochrane, and Scopus to identify randomized controlled trials (RCTs) that examined the effects of 10-Hz repetitive transcranial magnetic stimulation (rTMS) targeting the left dorsolateral prefrontal cortex as the main intervention. A meta-analysis was performed using a fixed-effect model to evaluate the mean differences and 95% credible intervals.

Result: Three studies met the inclusion criteria. The meta-analysis findings indicated that rTMS applied to the left dorsolateral prefrontal cortex significantly reduced craving scores (MD = -5.01, 95% CI = -5.94 to -4.07, p = 0.01). In contrast, participants receiving sham rTMS exhibited no significant difference in craving scores compared to the control group (MD = 0.29, 95% CI = -1.26 to 1.84, p = 0.72).

Discussion: The effects of rTMS on neurotransmission may involve modulating dopamine release, altering metabolite concentrations, and influencing glutamate receptor expression, all of which could contribute to neural plasticity changes during substance use recovery. Additionally, modifications in network connectivity induced by rTMS may explain the persistent reduction in cravings following multiple sessions.

Conclusion: High-frequency rTMS has been shown to effectively decrease cravings and impulsivity in individuals with methamphetamine addiction, highlighting its potential as a therapeutic intervention.

Keywords: Repetitive Transcranial Magnetic Stimulation, Left Dorsolateral Prefrontal Cortex, Methamphetamine, Drug Users

ID_79 Case Report/GP

Intracranial Hemorrhage following Thrombolytic Treatment in Adolescent Male with Acute Myocardial Infarction

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Background: Acute myocardial infarction (AMI) is a leading cause of death worldwide. Thrombolysis is used to destroy or dissolve the thrombi in vessels and is applied in various cardiovascular diseases, including AMI. Intracranial hemorrhage (ICH) is one of the life-threatening complications in thrombolytic treatment.

Case Summary: A 19-year-old male with a diagnosis of inferior ST-Elevation Myocardial Infarction (STEMI) refused Percutaneous Coronary Intervention (PCI) and underwent thrombolytics. He was then given streptokinase 1.5 million units for 60 minutes. Five hours after thrombolytics, he experienced unconsciousness. Neurological examination results found the Glasgow Coma Scale (GCS) of E2M5V3, anisocoria pupils, and the weakness of the right limbs. He was consulted to Neurologist and suggest head CT scan. Based on the results of a head CT scan, intraparenchymal hemorrhage of the left frontal lobe and left lateral intraventricular was found, accompanied by subfalcine herniation to the right side. He was consulted to neurosurgery, and a craniotomy was planned.

Discussion: Thrombolysis-related intracranial hemorrhage has a high mortality rate, and many factors can cause intracranial hemorrhage. Intracranial hemorrhage should be suspected in any patient who develops sudden neurological deterioration, a decline in the level of consciousness, new headache, nausea and vomiting, or a sudden rise in blood pressure after fibrinolytic therapy. Intracranial hemorrhage complications in STEMI cases are a challenge in their management, and we must carefully consider the risks and benefits before deciding on the treatment.

Conclusion: Intracranial hemorrhage is a common complication after thrombolysis in AMI and the management of such cases is still challenging.

Keywords: Acute myocardial infarction, Intracranial hemorrhage, Thrombolysis

ID_80 Research Abstract/GP

Understanding Non-Motor Symptoms in Indonesian Parkinson's Disease Patients: A Systematic Review of Reported Symptoms and Methodological Challenges

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Background: Non-motor symptoms (NMS) in Parkinson's disease (PD) significantly impact quality of life. However, research on NMS in Indonesian PD patients remains limited. Standardized instruments and methodologically robust studies are essential to improve management. This study provides an overview of reported NMS in Indonesian PD patients.

Methods: A systematic literature search was conducted using PubMed, Google Scholar, and relevant websites. Risk of bias was assessed using ROBINS-E.

Results: Among 19 studies (672 subjects), 17 were cross-sectional, published between 2016-2025. Fifteen had low risk of bias, while four showed selection bias. Reporting inconsistencies were noted in age, disease duration, and Hoehn & Yahr staging. Neuropsychiatric symptoms were the most reported domain (9 studies), followed by sleep disorders and gastrointestinal impairments (6 studies). Cognitive impairment was the most common symptom. Nineteen assessment tools were identified, with one lacking an Indonesian-validated version.

Discussion: NMS in Indonesian PD patients pose a significant burden. Inconsistencies in study design, assessment methods, and data reporting limit comparability. Cultural stigma may contribute to the underreporting of some NMS, while others might be overlooked as they are often perceived as normal aging processes. Limited access to movement disorder specialists and standardized tools further exacerbates. Additionally, selection bias in four studies, which focused on specific NMS, restricts generalizability but provides valuable insights. Addressing these challenges requires broader inclusion criteria, standardized assessments, and longitudinal study designs to improve data quality.

Conclusion: Standardized assessments, better specialist access, and routine screening are essential to improving NMS recognition in Indonesian PD patients.

Keywords: Indonesia, non-motor symptoms, Parkinson's disease

ID_81 Research Abstract/GP

Effect of Transcranial Direct Current Stimulation on Cognitive Function in Parkinson's Disease: A Systematic Review

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Background: Cognitive impairment is a common non-motor symptom of Parkinson's disease (PD) significantly impacting patients' quality of life. Transcranial direct current stimulation (tDCS), a non-invasive neuromodulation technique, has been explored as a potential therapy to enhance cognitive function in PD. However, its effectiveness remains inconclusive. This study aims to systematically review the impact of tDCS on cognitive function in PD patients.

Method: A systematic search of PubMed, Cochrane, ScienceDirect, and Medline was conducted following PRISMA guidelines. Randomized controlled trials (RCTs) investigating the effects of tDCS on cognitive function in PD patients were included. Study quality was assessed using the RoB 2 tool.

Results: Three RCTs involving anodal tDCS application over the left or bilateral dorsolateral prefrontal cortex (DLPFC) for 20-30 minutes per session were included. Two studies reported significant improvements in executive, language, and attentional functions compared to sham after daily sessions for two weeks, while one study reported no significant differences in cognitive function after a single session. No severe adverse effects were reported.

Discussion: tDCS enhances cognitive function in Parkinson's disease through short-term membrane polarization and long-term synaptic plasticity. Single sessions may be insufficient, requiring repeated stimulation with cognitive training. Its effects involve NMDA receptor-dependent plasticity, GABAergic modulation, and dopamine, which influences plasticity in a dosage-dependent manner for sustained cognitive improvement.

Conclusion: tDCS shows promise in improving cognitive function in PD patients after multiple sessions, but further large-scale studies are needed to confirm its long-term efficacy.

Keywords: Transcranial Direct Current Stimulation, tDCS, Parkinson's Disease, Cognitive Function

ID_82 Case Report/GP

Chorea-Hyperglycemia Basal Ganglia Syndrome (CHBG) in Patient with Uncontrolled Type-2 Diabetes Mellitus: a Rare Case Report

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Background: Chorea-Hyperglycemia Basal-Ganglia (CHBG) Syndrome is a rare complication of diabetes. It has prevalence of 1:100.000 in diabetes cases, with 90% of reported cases occurring in Asian population, with male-to-female ratio 1:1.7. However this ratio remains debated as some underdiagnosed or unreported case in other racial and gender groups.

Case review: A 56 year-old Female presented with a sudden new onset of involuntary movement in the right limbs, occurring only while awake. She had newly diagnosed Type-2 Diabetes Mellitus with uncontrolled blood sugar. No history of fever, trauma or drug use. Examination showed normal vital sign, fully alert and oriented. hemichorea in right limbs, glove-stocking paresthesia in both legs. No significant muscle weakness, normal tendon reflexes. Laboratory showed random glucose-level 437 mg/dL, blood-ketones 0.1 mmol/L, HbA1C 15.5%. Non-contrast Brain-CT revealed left basal-ganglia hyperdensity. Hyperglycaemia was treated with insulin, and haloperidol was given for the chorea. Symptoms improved and the patient was discharged.

Discussion : CHBG is rare non-ketotic-hyperglycaemia complication, with marked symptoms of hemichorea, best managed by glycemic controlled and anti-chorea medication. While its exact pathogenesis remains unclear, proposed pathogenesis involved the basal-ganglia dysfunction and subthalamic disinhibition, leading to involuntary movement such as chorea. This disinhibition is thought to be related to shift in brain metabolism pathways. The higher prevalence in females may be linked to increased dopamine receptor sensitivity in postmenopausal women.

Conclusion: CHBG is rare complication of diabetes, seen in patient with poor controlled glucose level. Early recognition and treatment of the hyperglycemia can reduced the chorea intensity.

Keywords: Chorea, Chorea Hypeglycemia Basal Ganglia Syndrome, Movement Disorder, Diabetes Mellitus Type 2

ID_83 Research Abstract/GP

Vagus Nerve Stimulation for Drug-Resistant Epilepsy in Adults: An Updated Systematic Review & Meta-analysis

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Background: Vagus nerve stimulation (VNS) is an approved procedure for therapy in drug-resistant epilepsy (DRE) patients who are ineligible for resection surgery. This study explores updated evidence of the efficacy of VNS in adults for short and long-term usage, and its application subcutaneously (iVNS) and transcutaneously (taVNS).

Methods: Included studies involved patients ⩾16 y.o receiving VNS therapy with minimum length of 4 weeks. Comprehensive literature search was done from 4 databases. We conducted meta-analysis and critical appraisal.

Result: From 14 studies included, VNS was associated with improved seizure control. Single-arm studies showed a pooled event rate of 47.1% for ⩾50% seizure reduction (p=0.732) and double-arm studies showed significant seizure reduction (OR=2.453, p=0,00). Significant seizure reduction was also shown in the <2 year double-arm studies (OR=2.396, p=0,02). Meta-regression analysis showed significant association of treatment duration of ⩾2 years with ⩾50% seizure reduction (logit event rate=1.2145, p=0.0434), while taVNS showed significant negative association to ⩾50% seizure reduction in single-arm studies (logit event rate=-1.87, p=0.0095), showing the superiority of iVNS.

Discussion: Significant seizure reduction was found among patients in double-arm studies compared to single-arm studies due to their direct comparison to placebo. The analysis also showed the delayed effect of VNS therapy in studies with ⩾2 years follow-up time and the superiority of iVNS, suggesting that VNS would be most suitable for those who have had long-term epilepsy, with the use of iVNS.

Conclusion: VNS has been proved to be beneficial for seizure reduction in adult DRE patients.

Keywords: vagus nerve stimulation, drug-resistant epilepsy, refractory epilepsy

ID_84 Case Report/Resident

Successful Cotrimoxazole Therapy As An Aternative Regiment For Toxoplasma Encephalitis In HIV-AIDS Patient

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Introduction: Toxoplasma Encephalitishas become one of the primary CNS problem among people living with human immunodeficiency virus (HIV)/AIDS. Pyrimethamine is one of the best studied and characterized anti-Toxoplasma agent relative to other drugs. However, due to a shortage of supplies of Pyrimethamine at our local hospital, an alternative regiment Cotrimoxazole was used for an HIV patient who experienced symptomatic TE. This case report is a successful therapy of a TE patient.

Case Report: A 49-years old male came to neurology clinic complaining of weakness half of body since two weeks. He has a history of fever and white patches on his tongue and oral cavity. The result of the HIV test was positive, and after a thorough examination, he was diagnosed with Toxoplasma Encephalitis. The patient was given cotrimoxazole 960 mg every six hours daily as an alternative treatment. Clinical improvement was reported after six weeks of therapy.

Discussion: Cotrimoxazole acts by inhibiting T. gondii proliferation and eradicating the pathogen by interfering with the folate metabolic pathway. These drugs inhibit the enzymes dihydrofolate reductase and dihydropteroate synthase, thereby inhibiting the synthesis of tetrahydrofolate, which is the precursor for the synthesis of T. gondii DNA. Due to its selective action on dihydrofolate reductase enzyme, cotrimoxazole has less hematological toxicity than pyrimethamine.

Conclusion: A case of toxoplasma encephalitis was reported. The firstline treatment for toxoplasma encephalitis is pyrimethamine and sulfadiazine; however, the patient was treated with cotrimoxazole as an alternative treatment. Clinical and MRI brain improvement was used to assess the success of therapy.

Keywords: Toxoplasma encephalitis, Cotrimoxazole

ID_85 Research Article/GP

Rebleeding and Functional Outcome of Endovascular Coiling Versus Surgical Clipping on Brain Aneurysm: A Systematic Review and Meta Analysis

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Background: Intracranial aneurysm is an abnormal dilatation of the cerebral vessels. While prompt treatment can reduce morbidity and mortality, fragile arterial walls can lead to rupture and cause life-threatening bleeding. Two primary approaches are endovascular coiling and surgical clipping; however, the most effective approach remains debatable. This study aims to evaluate the rebleeding rate and functional outcomes in patients with aneurysm who undergo either procedure.

Methods: Adhering to PRISMA 2020 guidelines, we searched PubMed, Cochrane Library, and Scopus for observational and clinical trial studies from 2005 – 2025 comparing coiling and clipping effectiveness and extracting rebleeding and functional outcome data.

Results: Twelve studies involving 5022 participants shows the use of clipping has no significant differences compared to coiling in the likelihood of rebleeding (OR 1.50%, [95% CI = 0.76 to 2.94], I2 = 63.1%, P = 0.0017). Of 4626 surviving participants during follow-up, 1575 subjects undergoing clipping have significant favourable outcomes (OR 0.71%, [95%CI = 0.61 to 0.82], I2 = 26.9%, P < 0.0001).

Discussion: Preventing aneurysm rebleeding, reducing mortality and dependency, is the main goal of aneurysm treatment. Studies show that residual aneurysms, which often lead to rebleeding, occur equally in both coiling and clipping. Endovascular techniques offer significant outcomes for uncomplicated access aneurysms with fewer periprocedural complications, while clipping remains important for treating large, broad neck aneurysms with lower rate of residual aneurysms.

Conclusion: When the choice of treatment is individualized, rebleeding rate between coiling and clipping provide similar results. However, this study found better patient independence in the clipping group during follow-up.

Keywords: brain aneurysm, coiling, clipping, rebleeding, mRS

ID_86 Case Report/GP

Paraprase And Gibbus Deformity As A Clinical Manifestation In Patients With Tuberculous Spondilitis: A Case Report

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Background: Tuberculous spondylitis is a form of extrapulmonary tuberculosis infection in the vertebral corpus structure that can cause neurological deficits and deformities.

Case Summary: A 19-year-old woman with chronic back pain, hunched posture and weakness of both lower legs since 5 years before admission to the hospital. Laboratory examination showed leukocytosis. Chest X-ray showed bronchopneumonia suspicious of pulmonary tuberculosis. Thoracolumbar X-ray showed compressive fracture of the 10th thoracal to 1st lumbar vertebral corpus with stenosis into the spinal canal. Magnetic Resonance Imaging showed an impression of destruction and deformity of the 7th to 11th thoracic vertebral corpus causing kyphotic, there was bilateral stenosis canal and neural foramen stenosis, opacity in the upper right lung field suspicious of pulmonary tuberculosis. Mantoux test showed positive induration. The patient was given Nonsteroidal Anti-Inflammatory Drugs, opioids, antitubercular drugs and surgery was planned after 2 weeks of receiving antitubercular.

Discussion: Tuberculous spondylitis is a destructive infection that affects the vertebral corpus structure progressively causing complications of neurological deficits of paraparesis and gibbus deformity. Clinical manifestations of TB spondylitis can resemble pyogenic spondylitis or metastatic tumors. MRI is the gold standard to show the extent of the disease, spread of abscesses and nerve compression. The most common location is the thoracolumbar vertebra. Tuberculous spondylitis therapy includes antitubercular for 9 to 12 months and surgery.

Conclusion: Tuberculous spondylitis progressively causes complications of paraparesis and gibbus deformity. Early diagnosis and treatment of tuberculous spondylitis are very important to determine the prognosis.

Keywords: spondilitis, tuberculous, chronic back pain, neurological deficits, gibbus deformity

ID_87 Research Article/GP

Predictive Value of the Serum Glucose-to-Potassium Ratio for Patients with Traumatic Brain Injury: A Meta-Analysis of Prognostic Studies

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Background: Traumatic brain injury (TBI) is a major cause of mortality and disability, especially in developing countries. A serum glucose-to-potassium ratio has been proposed to improve diagnostic accuracy by incorporating two biomarkers, reducing false positives.

Method: This meta-analysis systematically reviewed PubMed, MEDLINE, Cochrane, and Scopus for prognostic studies on the glucose-to-potassium ratio in TBI patients. A random-effects model assessed mean differences and 95% credible intervals of glucose, potassium, and their ratio between good and poor outcome groups. Poor outcome is calculated by modified ranking score (mRS) > 4. This meta-analysis use random-effect model analysis.

Result: Four prognostic studies that reached the inclusion criteria were analyzed. Poor outcome group has a significant differences with higher glucose concentration (MD: 35.89, 95%CI: 0.76-71.02, p = 0.05), lower potassium concentration (MD: -0.19, 95%CI: -0.02- (-0.36), p = 0.03), and higher glucose-to-potassium ratio (MD: 12.02, 95%CI: 0.23-23.80, p = 0.05).

Discussion: TBI disrupts cellular membranes, altering ion balance and membrane potential. Glutamate release and NMDA receptor activation cause calcium and sodium influx with potassium efflux, regulated by the energy-dependent sodium-potassium-ATPase pump. Meanwhile, cerebral glucose uptake declines with TBI severity and age, often leading to hyperglycemia. However, the variation in cutoff values for predicting poor outcomes remains a limitation, requiring further research to establish a standardized threshold.

Conclusion: An elevated glucose-to-potassium ratio was the sole biomarker linked to worse outcomes and higher mortality rates.

Keywords: glucose, potassium, glucose-to-potassium ratio, stress index, traumatic brain injury

ID_88 Case Report/GP

Dilemmatic Intersection in Cryptococcal Meningitis Treatment: Side Effects, Drug Resistance, and Efficacy

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Background: Fluconazole resistance in Cryptococcus neoformans is progressively increasing over the past 10 years, particularly in developing countries, which reached 43.6% resistance rate. This case demonstrates the emerging dilemma of cryptococcal meningitis management with antifungal resistance.

Case Summary: A 31-year-old male with HIV presented with severe headache, hearing loss, and fever. Brain imaging was within normal limits, and CSF analysis showed increased cell count (86, PMN 10, MN 76), elevated protein, glucose ratio <0.4, positive India ink, and positive Cryptococcus Ag, leading to a diagnosis of cryptococcal meningitis. He was treated with IV Amphotericin B for 14 days and Fluconazole, but developed acute kidney injury (AKI), delaying further fluconazole therapy. One month later, he returned with severe headache; CSF re-analysis showed positive Cryptococcus culture and fluconazole resistance. The patient was treated again with IV Amphotericin B for 14 days.

Discussion: Azole resistance in Cryptococcus spp is associated with ERG11 gene mutation which is the fluconazole's target. Interruption of fluconazole in cryptococcal meningitis during the theraphy phase could be the risk factor for acquired resistance. The minimum inhibitory concentrations (MIC) test can help in the selection of therapy with Cryptococcus breakpoint for fluconazole susceptibility is MIC < 8 µg/mL. In previous cases, itraconazole and voriconazole were proven to replace fluconazole. However, in this case, there were limitations in costs and treatment coverage.

Conclusion: Drug evaluation in parallel with treatment in Cryptococcal meningitis, with prior fluconazole use or delayed therapy, is recommended

Keywords: Cryptococcal Meningiitis, HIV, Fluconazole resistance

ID_89 Research Article/GP

Risk Factors of Cryptogenic Stroke in the Young: a Systematic Review and Meta-Analysis

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Background: Cryptogenic ischemic stroke (CIS), accounting for up to half of ischemic stroke, presents a diagnostic challenge due to its undefined etiology. The global incidence of ischemic stroke in the young adult population has become more prevalent. Identifying and understanding the risk factors associated with cryptogenic stroke are crucial for developing effective prevention and management strategies. This is the first systematic review to assess the risk of factors of cryptogenic stroke in the young.

Method: PubMed, Cochrane Library, and Europe PMC databases were searched to select studies within the past five years. The retrieved literature was carefully reviewed, and various information was extracted for each examined study. Results: Seven studies were included in meta-analysis. Eight atherosclerotic risk factors were significantly associated with the incidence of CIS in the young population compared to healthy controls. Pooled MD and OR with 95% confidence intervals (CIs) for these risk factors were as follows: BMI (MD:0.69, 95%CI:0.20-1.18), waist-to-hip ratio (MD:0.03, 95%CI:0.02-0.04), obesity (OR:1.67, 95%CI:1.42-1.98), smoking (OR:1.98, 95%CI:1.50-2.62), excessive alcohol consumption (OR:1.99, 95%CI:1.62-2.44), physical inactivity (OR:1.37, 95%CI:1.13-1.68), diabetes (OR:1.72, 95%CI:1.02-2.91), and hypertension (OR:1.46, 95%CI:1.25-1.70). As for cardiac physiology, no association was found with echocardiographic LVEF, suggesting a limited role of cardiac systolic function in young CIS.

Discussion: This study demonstrates that atherosclerosis risk factors in young individuals may be associated with cryptogenic stroke.

Conclusion: Our study found that the atherosclerosis risk factors including BMI, waist-to-hip ratio, obesity, smoking, and physical inactivity, along with diabetes and hypertension, significantly increase CIS risk in young individuals.

Keywords: cryptogenic stroke, young adult, risk factor

ID_90 Research Article/GP

Telemedicine and Mobile Health as Game Changers in Secondary Stroke Prevention: A Systematic Review from Emerging and Developing Countries

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Background: Stroke is a significant health burden in Indonesia, with a prevalence of 10.9 per 1,000,000 and substantial healthcare costs. Secondary prevention is vital for reducing recurrent strokes and morbidity. This systematic review evaluates telemedicine and mobile applications for secondary stroke prevention in emerging economies, where effectiveness is uncertain due to socioeconomic and resource constraints, focusing on patient outcomes.

Methods: A systematic search was conducted in PubMed and Ovid Medline for English-language studies from 2010 to 2024. Inclusion criteria included adult patients and free full-text availability, excluding systematic reviews and studies from high-income countries.

Results: Eight studies (n=2,723 patients) from five emerging economies were included. Mobile applications were the predominant intervention (62.5%). Four studies reported significant reductions in systolic blood pressure (range: 2.8-9.1 mmHg). Improvements were noted in medication adherence, time-to-treatment, quality of life, and reductions in stroke recurrence and mortality. High patient satisfaction (96.07%) and acceptability (95.6%) were reported, despite challenges like connectivity issues

Discussion: This review highlights the potential of telemedicine and mobile apps in improving blood pressure, quality of life, and medication adherence in emerging economies. However, challenges such as network connectivity issues and low literacy levels were identified. Customizing interventions to local contexts is crucial. Future research should focus on long-term efficacy, cost-effectiveness, and larger, diverse samples to strengthen evidence.

Conclusions: Telemedicine and mobile app interventions show promise as game changers for narrowing the gap in stroke secondary prevention in low-resource settings. These findings can guide stakeholders in optimizing stroke care in emerging economies like Indonesia.

Keywords: Telemedicine, mobile health, secondary stroke prevention, developing countries

ID_91 Case Report/GP

Intratumoral Hemorrhage in Pediatric Type Diffuse High Grade Glioma : A Case Report

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Background: Brain tumors are a significant cause of intracerebral hemorrhage. Intratumoral hemorrhage is a part of intracerebral hemorrhage. The incidence of intracerebral hemorrhage in glioma ranges from 3.7% to 7.2% and the majority of these cases are high grade gliomas.

Case Summary: A 1 year 10 month old boy presented with complaints of seizures affecting the face and right sided limbs, occurring four times, each lasting less than one minute. The patient had a history of previous seizures. No limb weakness or loss of consciousness was observed. A non-contrast head computed tomography (CT) scan revealed a hypodense, round shaped lesion with a diameter of 18.67 mm with Hounsfield Unit (HU) 28-35, surrounded by a hyperdense area and perifocal edema in the left parietal lobe. A contrast head CT scan showed strong enhancement of the hypodense lesion (HU 121-125). The median cistern was deviated to the right. The patient underwent craniectomy and tumor removal. Histopathological examination confirmed Pediatric Type Diffuse High Grade Glioma.

Discussion: Intratumoral hemorrhage is complication of brain tumors. The occurrence of hemorrhage may increase with tumor size due to direct compression and abnormalities in tumor vascularization.

Conclusion: Intratumoral hemorrhage is often caused by malignant tumor types, one of which is high grade glioma.

Keyword: Brain Tumor, Intratumoral Haemorrage, Pediatric Type Diffuse High Grade Glioma, Seizure.

ID_92 Case Report/GP

Hemichorea-Hemiballismus Sinistra Due To Ischemic Stroke In Nonketotic Hyperglycemia Patient : A Rare Case Report

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Background : Hemichorea-Hemiballismus (HCHB) is a rare hyperkinetic movement disorder characterized by a high-amplitude movements of a unilateral arm and leg, associated with a contralateral lesion in the subthalamic nucleus and basal ganglia. HCHB occurs in 0.4% to 0.54% of acute ischemic stroke cases.

Case summary : This case presents a 63-year-old woman who came to the emergency department with sudden, intermittent episodes of uncontrollable movement of her left upper and lower extremities in recent days. She had a history of infarct stroke five year ago, resulting in left-sided hemiparesis as a sequelae symptom, along with chronic hypertension and diabetes mellitus type 2 controlled by insulin. Blood glucose level at presentation was 564 mg/dL, with an HbA1c of 9.4%. Urinalysis showed glucose +4 with negative ketones. Magnetic Resonance Imaging (MRI) revealed an infarction in the right lentiform nucleus and corona radiata. She was treated with clopidogrel 75 mg once daily and haloperidol 0,5 mg twice daily with close monitoring of blood pressure and glucose level. After five days of hospitalization, her symptoms improved and was discharged with outpatient follow-up care.

Discussion: Hyperkinetic movement disorders are rare in stroke cases. Poorly controlled diabetes can contribute to hemiballismus and hemichorea due to acute basal ganglia dysfunction, which increases the risk of cerebrovascular ischaemia and reduces cerebral blood flow. The use of neuroleptics has been considered to reduce severity of choreiform movements.

Conclusion: HCHB should be treated like an aacute stroke unless additional reasons are identified.

Keywords: Hemichorea, Hemiballismus, Hyperglikemia, Stroke

ID_93 Case Report/GP

Recurrent Non-Hemorrhagic Stroke in a Patient with Polycythemia Vera

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Background: Polycythemia Vera (PV) is a clonal myeloproliferative neoplastic disorder characterized by increased erythrocytes in the blood. PV often leads to complications, including thrombosis, which can be fatal. Thrombosis in PV may cause various conditions, including non-hemorrhagic stroke.

Case Summary: A 57-year-old male patient of Timor ethnicity was referred from a private hospital with complaints of right-sided weakness, which worsened six hours before admission. The symptoms appeared suddenly while the patient was walking around the house. He had experienced similar episodes from 2011 to 2024. PV was diagnosed during a routine check-up, and a Janus Kinase 2 (JAK2) gene mutation was confirmed through further lab tests.

Discussion: PV patients are at an increased risk of complications like thrombosis, which can trigger non-hemorrhagic stroke. Mechanisms for stroke development in PV include increased blood viscosity, hypercoagulability, elevated platelets, and microvascular disease. Management of PV focuses on reducing complication risks and improving patient quality of life and prognosis.

Conclusion: Non-hemorrhagic stroke is a common complication in PV, often associated with thrombosis. Thrombosis in PV patients can result from various mechanisms. Additionally, bleeding complications, such as hemorrhagic stroke, may also occur in PV patients

Keyword: Non-hemorrhagic stroke, Polycythemia Vera, Thrombosis, JAK2

ID_94 Case Report/GP

Case Report: First Stroke Code Activation for Thrombolytic Therapy in A Patient with Acute Ischemic Stroke

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Background: Intravenous thrombolysis with tissue plasminogen activator (tPA) is the primary treatment for acute ischemic stroke (AIS) within less than 4.5 hours onset. The "time is brain" principle emphasizes the importance of early intervention for better outcomes.

Case Description: Female, 69-year-old, presented to the emergency department with sudden-onset left-sided weakness 2.5 hours before hospital arrival. Blood glucose was 91 mg/dL. There were no complaints of vomiting, headache, or seizures. She was suspected with AIS and underwent the first-ever code stroke activation at Majalaya Hospital. Physical examination revealed left facial droop, dysarthria, and left hemiparesis. CT scan showed a right basal ganglia hypodense lesion with no signs of hemorrhage. The National Institutes of Health Stroke Scale (NIHSS) score was 9, and the Modified Rankin Scale (mRS) was 4. The patient subsequently received thrombolysis with alteplase, achieving a door-to-needle time of 65 minutes, slightly exceeding the less than 60 minutes target. Significant clinical improvement was observed 1.5 hours post-thrombolysis (NIHSS 0, mRS 1). Left limb strength improved from 2 to 4+. At the 6-month follow-up, there were no neurological deficits or recurrent strokes.

Discussion: Faster thrombolysis reduces bleeding risk, accelerates recovery, and improves patient independence. A well-coordinated stroke team ensures rapid AIS management.

Conclusion: Although door-to-needle time exceeded 60 minutes, code stroke activation significantly reduced delays and improved thrombolysis outcomes.

Keywords: Ischemic Stroke, Thrombolysis, Code Stroke, Outcome

ID_95 Case Report/GP

Horner's Syndrome in Pancoast Tumor: A Case Report

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Background: Pancoast tumors, or superior sulcus tumors, are a rare type of lung cancer, accounting for less than 5% of cases. Symptoms of Pancoast tumors depend on the affected organs. Chest and shoulder pain are the most common early symptoms. However, Horner's syndrome is observed in less than 25% of cases.

Case Description: Male, 39-year-old, presented to the emergency department with shortness of breath, chest pain, and left shoulder and back pain radiating to the left arm without neurological deficits in the lower extremities. Other symptoms included a productive cough, intermittent fever, nausea, and weight loss. Multiple electrocardiograms (ECG) were performed due to suspected coronary disease, but all results were normal. A chest X-ray showed a left apical infiltrate with opacity. A non-contrast thoracic CT scan suggested a left lung mass, and a biopsy confirmed moderately differentiated adenocarcinoma. The patient was diagnosed with left apical lung cancer (Pancoast tumor). 1.5 months later, he returned to the emergency department with worsening dyspnea. Upon physical examination, Horner's syndrome (ptosis and anhidrosis) was observed ipsilateral to the lung mass

Discussion and Conclusion: Horner's syndrome (ptosis, miosis, and ipsilateral anhidrosis) occurs due to disruptions in one of the three levels of the sympathetic pathway to the head: the 1st-order (central), 2nd-order (preganglionic), or 3rd-order (postganglionic) neurons. In Pancoast tumors, Horner's syndrome arises due to the invasion of 2nd-order (preganglionic) neurons exiting the ventral spinal roots. These fibers arch over the lung apex and ascend via the cervical sympathetic chain to the superior cervical ganglion.

Keywords: Horner's syndrome, Pancoast tumor, Lung cancer, Sympathetic pathway

ID_96 Case Report/GP

Recurrent Vertigo Followed By Brainstem Hemorrhage In Uncontrolled Hypertension

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Background: Stroke remains one of the leading causes of mortality. Spontaneous Intracerebral Hemorrhage accounts for up to 19.6% of all strokes with 6-10% affected in the brainstem.

Case summary: This case presents a 76 year old man with a 10-year history of uncontrolled hypertension who regularly consumed herbal medicine. He arrived at the Emergency Department (ED) with a sudden loss of consciousness, preceded by a stress ulcer. Allo-anamnesis revealed frequent dizziness in recent weeks without medical attention. His blood pressure was 220/113 mmHg, The Glasgow Coma Scale score indicated sopor, anisochoric pupils and right-sided lateralization. The patient was intubated in the ED and admitted to the ICU. A Head CT Scan highlighted a massive hemorrhage (26 mL) involving mesencephalon and pons accompanied by acute hydrocephalus. Emergency treatment included intubation, intravenous nicardipine, mannitol, tranexamic acid, and neurosurgical consultation. However, there was no improvement after treatment and he did not survive.

Discussion: Brainstem hemorrhage can produce vertigo due to increased intracranial pressure symptoms. The need for mechanical ventilation, hydrocephalus and altered mental status were associated with a poor prognosis. The best diagnostic modality is a head CT Scan. The most common causes are uncontrolled hypertension and cigarette smoke.

Conclusion: Preventing stroke through effective blood pressure control is essential to reduce the incidence of hemorrhagic stroke.

Keywords: Brainstem Hemorrhage, reccurrent vertigo, Hypertension, Intracerebral Hemorrhage, Stroke

ID_97 Case Report/GP

Case Report : The Use of MRI Diffusion Weighted Imaging (DWI) in Diagnosing Ischaemic Stroke in 54 Year-Old Patient

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Background: Stroke is a serious medical condition that requires prompt diagnosis and treatment to prevent irreversible brain damage. Effective treatment depends on an accurate diagnosis, supported by diagnostic tools such as MRI Diffusion Weighted Imaging.

Case Summary : A 54-year-old man arrived at the hospital with complaints of weakness in his right limbs and slurred speech that had started an hour before admission. He had a known history of hypertension. Laboratory tests indicated an elevated erythrocyte sedimentation rate as the only significant finding. Given that his symptoms had begun less than three hours prior, an MRI DWI scan was performed, revealing a hyperacute ischemic lesion in the left temporoparietal cortex and an old lacunar infarct in the superior right parietal white matter. The patient was subsequently treated with thrombolytic therapy, with continuous monitoring of his blood pressure throughout the procedure.

Discussion : This case report discusses the diagnosis of acute ischemic stroke using MRI DWI imaging, which can provide rapid and efficient visualization, allowing for timely treatment selection and ultimately improving patient prognosis. The implementation of optimal management strategies is essential in mitigating the extent of neuronal damage and markedly reducing the risk of associated complications.

Conclusion : Early diagnosis and treatment of acute ischemic stroke are crucial to preventing brain damage. This case demonstrates the effectiveness of MRI DWI in quickly identifying ischemic lesions, enabling timely intervention. Thrombolytic therapy with continuous monitoring plays a key role in enhancing recovery, reducing complications, and improving prognosis.

Keywords: case report, MRI DWI, Ischemic Stroke

ID_98 Case Report/Resident

Clinical And Treatment Approaches In Relapsing Anti-N-Methyl-D-Aspartate Receptor Encephalitis: A Case Report

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Background: Anti-N-methyl-D-aspartate receptor (NMDAR) encephalitis is the most well-known type of autoimmune encephalitis, characterized by distinctive clinical symptoms including neuropsychiatric manifestations, and may relapse within two years.

Case Summary: An 18-year-old female with a history of autoimmune encephalitis was brought to the emergency department with right-sided seizures lasting for 3 minutes. Cerebrospinal fluid (CSF) analysis indicated inflammation and anti-NMDAR antibodies were detected. Magnetic resonance imaging (MRI) revealed cerebellar atrophy and ventricular dilation. After first-line treatment with steroids, the seizures persisted, prompting rituximab as second-line therapy. By day 10 after treatment, the patient showed improvement with no further seizures. She was discharged for home care with follow-up and a planned second rituximab cycle.

Discussion: Anti-NMDAR encephalitis has a higher incidence in females, particularly among younger individuals. Relapses were estimated to affect 23–24% of patients, typically occurring after a median of 2 years, more common in patients without tumors and those who received only immunotherapy. This patient has a history of autoimmune encephalitis 2 years before and did not receive immunotherapy. In a recent condition, we treated her with aggressive steroid therapy followed by rituximab. Her condition gradually improved. Rituximab demonstrates an 80 % favorable prognosis rate in cases unresponsive to first-line treatments.

Conclusion: Most patients with relapse of anti-NMDAR encephalitis achieved favorable long-term functional outcomes. The clinical approach focuses on the identification of symptoms and immediate initiation of immunotherapy as first-line treatment and rituximab as second-line therapy may help reduce the risk of relapse and provide a good outcome.

Keywords: anti-NMDAR encephalitis, relapse of anti-NMDAR encephalitis, seizures, immunotherapy, rituximab

ID_99 Research Article/GP

Impact of Temozolomide-Based Chemoradiotherapy on Glioblastoma Outcomes : A Systematic Review

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Background : Glioblastoma multiforme (GBM) is an aggressive brain tumor with a poor prognosis. Standard treatment includes surgical resection, radiotherapy, and temozolomide (TMZ)-based chemotherapy. While TMZ improves survival, outcomes vary. This systematic review evaluates the impact of TMZ-based chemoradiotherapy on overall survival (OS), progression-free survival (PFS), and quality of life in GBM patients.

Method : A systematic literature search was conducted in PubMed, ScienceDirect, and ResearchGate for studies published in the last five years. Studies on TMZ-based therapy in GBM patients reporting OS, PFS, or quality of life were included. Selection followed PRISMA guidelines.

Result : Out of 1,202 papers screened, 16 studies met the inclusion criteria. Extending TMZ beyond six cycles improved OS. Delaying chemoradiotherapy (CRT) beyond six weeks post-surgery worsened survival, while starting within 12 weeks had no significant impact. CRT improved OS compared to radiotherapy alone. Prognostic factors such as MGMT methylation, extent of resection, and Karnofsky Performance Score (KPS) were associated with better outcomes.

Discussion : The findings highlight the importance of early CRT initiation and prolonged TMZ therapy for survival benefits. Treatment response variability suggests the need for individualized approaches. However, differences in study methodologies and follow-ups warrant further high-quality trials to establish optimal protocols.

Conclusion : TMZ-based chemoradiotherapy improves GBM survival, with extended TMZ cycles offering additional benefits. Prognostic factors are crucial in treatment decisions. Further research is needed to refine therapy duration and identify patients who benefit most.

Keywords: Glioblastoma Multiforme, Temozolomide, Chemoradiotherapy, Survival

ID_100 Case Report/GP

Transcranial Magnetic Stimulation in the Treatment of Right Homonymous Hemianopia Post Left Occipital ICH: A Case Report

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Background: Mobility and everyday activities are hampered by right homonymous hemianopia (RHH), which frequently occurs after intracerebral hemorrhage (ICH) affecting the left occipital lobe. In cases of serious brain injury, traditional rehabilitation techniques are not very effective. As a neuromodulatory therapy, transcranial magnetic stimulation (TMS) has gained popularity for improving visual function by encouraging cortical remodeling and neuronal plasticity.

Case Summary: A 71-year-old man complained of vertigo, photophobia, bewilderment, ocular pain, and vomiting. He complained of frequent crashes, reading difficulties, and loss of vision field. The left temporal and occipital lobes had a hyperacute-acute hemorrhage (2.9 × 7.5 × 5.5 cm) on MRI, obliterating the left lateral ventricle. He was found to have chronic glaucoma, alexia without agraphia, and RHH. A follow-up MRI revealed that the bleeding had completely stopped. TMS treatment increased the visual field by 16% in the right eye and 9% in the left, despite ongoing peripheral constriction.

Discussion: This example demonstrates the potential of TMS in RHH rehabilitation following left occipital ICH, an area where traditional approaches frequently prove inadequate. TMS improves visual function by encouraging cortical remodeling and neuronal plasticity. Improvements in perimetry bolster its use as an adjuvant treatment. For best results, more research is required to improve procedures and create individualized treatment programs.

Conclusion: In persistent RHH following left occipital ICH, TMS offers potential for visual restoration. Even though there have been gains, more study is required to create uniform therapeutic standards for visual rehabilitation following a stroke.

Keywords: right homonymous hemianopia, RHH, TMS, ICH

ID_101 Research Article/GP

A Systematic Review of Safinamide's Effectiveness on Urinary Symptoms in Parkinson's Disease Patients

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Background: Parkinson's disease (PD) is characterized by both motor and non-motor symptoms, including urogenital disturbances that could severely affect the quality of life, with few treatment options available. Safinamide, a selective monoamine oxidase B (MAO-B) inhibitor that also modulates glutamate, has shown effectiveness in managing PD symptoms, though its impact on urogenital symptoms remains insufficiently studied.

Objective: This systematic review examines the efficacy of safinamide in alleviating Urogenital non-motor symptoms in PD patients.

Methods: Following PRISMA guidelines, a systematic search was conducted in PubMed and other sources. Two studies met the inclusion criteria and were analyzed for Urogenital related outcomes.

Results: Santos-Garcia et al. found significant reductions in Non-Motor Symptoms Scale (NMSS) Urinary scores (42.72 ± 30.41 to 50 30.62 ± 23.94, p = 0.003), suggesting safinamide's efficacy in Urinary symptom relief. In contrast, De Masi et al. reported no significant improvement in Urinary scores on the NMSS (16.00±11.53 to 15.86±10.05, p = 1.000). Both studies highlighted safinamide's tolerability and improvement in motor fluctuations.

Conclusion: Safinamide appears to hold promise in alleviating urinary symptoms in PD, especially as an adjunct therapy to levodopa. Its dual action on both dopaminergic and non-dopaminergic pathways suggests potential in treating PD-related non-motor symptoms. With limited treatment options for urinary dysfunction in PD, further studies involving larger patient groups are necessary to determine its clinical relevance. Keyword(s): Urinary, non-motor symptoms, Parkinson's disease, safinamide

Keywords: Urinary, non-motor symptoms, Parkinson's disease, safinamide

ID_102 Case Report/GP

Vasculitic Infarction As A Rare Complication Of Intracranial Tuberculoma: A Case Report

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Introduction: Central nervous system tuberculosis is the most severe form of extrapulmonary tuberculosis, with high mortality and morbidity rates. Intracranial tuberculoma tends to induce secondary vasculitis through various mechanisms that contribute to the development of cerebrovascular complications. This case report discusses intracranial tuberculoma complicated by vasculitis, a rare condition.

Case Report: A 40-year-old woman presented to the emergency department with muscle weakness and sensory disturbances in the extremities and face, accompanied by dysarthria. She also reported productive cough, intermittent fever, and a weight loss of 5 kg over the past two months. Chest X-ray revealed miliary tuberculosis. Contrast-enhanced MRI showed multiple lesions of varying sizes, with the largest lesion measuring 0.56 cm in diameter, well-defined but with irregular margins. Post-contrast imaging revealed rim enhancement, consistent with tuberculoma. Additionally, a left subacute pontine infarction and ventriculomegaly were observed. The patient underwent a nine-month course of antituberculosis therapy, including high-dose rifampicin and streptomycin during the first two months. Corticosteroids and diuretics were also administered as adjunctive therapy.

Discussion: Intracranial tuberculoma is known to cause intracranial vasculitis, increasing the risk of vasculitic infarction. The occurrence of infarction in intracranial tuberculoma can worsen the patient's prognosis, highlighting the need for early detection and appropriate management.

Conclusion: This case underscores the importance of considering infarction secondary to intracranial tuberculoma. Early detection and proper management can prevent further complications and improve patient outcomes. Further studies are needed to understand the immunopathogenic mechanisms underlying vasculitic infarction in intracranial tuberculoma, which may enhance diagnostic and therapeutic strategies.

Keywords: Vasculitic infarction, Mycobacterium tuberculosis, Intracranial tuberculoma, Central nervous system tuberculosis

ID_103 Case Report/GP

An isolated Oculomotor Palsy with Pupillary Involvement as Manifestation of TB Meningitis

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Background : Isolated oculomotor nerve palsy (N3 palsy) is most commonly caused by aneurysms, particularly posterior communicating artery (PComA) aneurysm, but may also result from infections such as tuberculous meningitis (TBM). TBM is a notable cause of cranial nerve palsies, including oculomotor palsy.

Case Summary : A 51-year-old male presented with acute-onset (three days prior) right-sided ptosis, preceded by subacute headache that began seven days prior. Neurological examination revealed no significant deficits aside from right-sided partial ptosis with pupillary involvement. Non-contrast brain CT was unremarkable. The patient was initially managed with rehydration therapy, corticosteroids and antibiotic. At first, patient had improvement in headache and diplopia. A lumbar puncture was attempted but resulted in a dry tap. On the fourth day, the patient had generalized seizures and loss of consciousness. Non-contrast brain CT revealed hydrocephalus and brain edema. Anti-TB therapy was initiated.

Discussion : TBM is rarely the first diagnosis considered with N3 palsy patient. However, in TB-endemic regions such as Indonesia, it is crucial for clinicians to remain vigilant. The pathophysiology of TBM-related N3 palsy is primarily driven by an inflammatory response. Mycobacterium tuberculosis induces exudative and proliferative lesions, leading to exudate deposition around the brainstem. This inflammatory process can result the oculomotor nerve palsy.

Conclusion : TBM is a rare cause of isolated oculomotor palsy, it should be part of the differential diagnosis in TB-endemic areas, especially in cases with progressive neurological symptoms. Early detection and initiation of anti-TB therapy are crucial in patient management.

Keywords: Oculomotor nerve palsy; Tuberculosis meningitis;aneurysms

ID_104 Case Report/GP

Dysgeusia: Deserted and Devastating Symptom in Acute Ischemic Stroke - a case report

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Background: Dysgeusia is a gustatory disorder encompassing taste alterations such as ageusia, hypogeusia, parageusia, and phantogeusia, significantly impacting appetite, nutrition, and quality of life. We reported a case of acute ischemic stroke with dysgeusia as one of the disabling and frustrating symptoms in the patient.

Case Summary: A male, 54 years old presented with a sudden onset of right-sided weakness accompanied by slurred speech and facial asymmetry. The patient reported taste disturbances and loss of taste perception leading to a decreased appetite. A brain MRI was performed revealing an acute brain infarction in the left basal ganglia and insular cortex.

Discussion: Stroke-related dysgeusia occurs when ischemic damage disrupts the gustatory pathway, which includes cranial nerves VII, IX, and X, the nucleus tractus solitarius, thalamus, and insular cortex. Lesions in the brainstem, thalamus, or cortex that disturbs this pathway, can impair taste perception, resulting in bilateral disturbances. In 2022, the WHO estimated that 12 million people suffered from stroke complications, with older adults highly at risk. However, data on post-stroke dysgeusia remain scarce, particularly in Indonesia, due to inadequate surveillance and economical or geographical challenges. Beyond neurological damage, factors such as genetics, environmental exposures, and medications can contribute to dysgeusia. Management requires a multidisciplinary approach, including nutritional support through dietary modifications and rehabilitative therapies.

Conclusion: Addressing dysgeusia in stroke patients is crucial to prevent malnutrition, improve post-stroke recovery and overall quality of life.

Keywords: Dysgeusia, Ischemic stroke

ID_105 Case Report/GP

Hemiballismus in a Patient with Suspected Non-Hemorrhagic Stroke and Hyperglycemia: A Case Report from a Rural Area in Indonesia

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Background: Hemiballismus is a rare hyperkinetic movement disorder characterized by sudden, high-amplitude involuntary movements, often associated with cerebrovascular diseases, particularly in patients with uncontrolled diabetes or non-hemorrhagic stroke. Although hemiballismus is rarely documented, understanding its pathophysiological mechanisms is essential for delivering appropriate therapy.

Case Summary: This report presents the case of a 68-year-old female with hemiballismus secondary to a non-hemorrhagic stroke and uncontrolled hyperglycemia. Symptoms included involuntary movements on the left side of the body, weakness on the right side, and facial asymmetry. The diagnosis was based on anamnesis, physical examination, and the Siriraj Stroke Score (-6), with blood glucose levels reaching 446 mg/dL. Treatment focused on controlling hyperglycemia with insulin, administering neuroprotective agents, and using pharmacotherapy to manage hemiballismus symptoms.

Discussion: Hemiballismus in this patient was attributed to ischemia of the subthalamic nucleus and hyperglycemia, which caused increased blood viscosity and neurotransmitter imbalance involving GABA and dopamine. Non-ketotic hyperglycemia further exacerbated the condition. A comprehensive treatment approach, including metabolic control and pharmacotherapy with clonazepam and gabapentin, led to significant clinical improvement.

Conclusion: Hemiballismus due to non-hemorrhagic stroke and hyperglycemia requires a multidisciplinary approach for effective management. This case underscores the importance of metabolic control and targeted therapy in treating hemiballismus.

Keywords: Hemiballismus, non-hemorrhagic stroke, hyperglycemia, movement disorder

ID_106 Case Report/GP

Moyamoya Disease with Suzuki Stage III in an Adult Patient: Diagnosis and Conservative Management in an Ischemic Stroke Case

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Background: Moyamoya disease (MMD) is a rare, progressive cerebrovascular disorder characterized by stenosis of the terminal internal carotid artery and the development of abnormal collateral vessels. The disease can lead to ischemic or hemorrhagic strokes, with a higher prevalence in Asian populations. Timely diagnosis and appropriate management are essential to prevent recurrent strokes.

Case Summary: A 38-year-old Indonesian-Chinese male with a history of ischemic stroke in 2023 presented with sudden weakness in the left leg for two days. MRI revealed acute lacunar infarction in the superior frontal gyrus, while MRA indicated stenosis in the anterior cerebral artery (ACA). Cerebral angiography confirmed Suzuki Stage III Moyamoya disease, showing occlusion of proximal A1 of the right ACA and collateral circulation from the left posterior cerebral artery (PCA) filling the ACA and MCA territories.

Discussion: Moyamoya disease often presents with ischemic stroke, as seen in this patient, who had both acute and chronic ischemic changes on MRI. Suzuki Stage III is characterized by significant stenosis of major cerebral arteries, yet collateral vessels still maintain blood flow to affected brain regions. Medical therapy, including cilostazol, rosuvastatin, and antiplatelet agents, was initiated to improve cerebral perfusion and manage risk factors. Physical rehabilitation was also critical in restoring motor function.

Conclusion: In Suzuki Stage III, conservative management can improve outcomes, but long-term monitoring and risk factor control are crucial to prevent recurrence. Surgery is considered if conservative measures fail or if severe neurological deficits are present.

Keywords: Moyamoya disease, Suzuki Stage III, ischemic stroke, conservative management.

ID_107 Case Report/GP

Internuclear Ophthalmoplegia In Heavy Smokers And Uncontrolled Hypertension: A Case Report

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Background: Internuclear ophthalmoplegia (INO) is an ocular movement disorder caused by a lesion of the medial longitudinal fasciculus (MLF). It is characterized by impaired adduction of the ipsilateral eye with nystagmus of the abducting eye.

Case Summary: 50-year-old male presented to the emergency department with a 12-hour history of dizziness accompanied by double vision, mild right-sided weakness, slurred speech, and deviation of the lips to the left. He had a history of uncontrolled hypertension and was a heavy smoker, consuming 2 to 3 packs per day since adolescence. Ocular examination revealed impaired adduction in the left eye and abduction nystagmus in the right eye. A computed tomography (CT) scan of the head without contrast showed infarction of the left thalamus, left lentiform nucleus, and pons. The clinical presentation and examination were sufficient to make the diagnosis of INO. During hospitalization, he was treated with dual antiplatelet agents, antihypertensives, and other symptomatic treatments. At follow-up in the neurology clinic two weeks later, his symptoms had gradually improved.

Discussion: The MLF ischemia caused impaired ipsilateral eye adduction and contralateral eye nystagmus (INO). The biggest risk factor in this patient leading to ischemic stroke was a history of uncontrolled hypertension, exacerbated by a lifestyle of heavy smokers.

Conclusion: This case highlights the importance of recognizing INO in patients with lifestyle factors that contribute to vascular disease, such as smoking and hypertension. Continued education and preventive measures targeting modifiable risk factors remain essential to improve overall health outcomes.

Keywords: Internuclear Ophthalmoplegia (INO), Infarction of the pons, Heavy smokers

ID_108 Case Report/GP

Factors Associated with Early Neurological Improvement after Intravenous Thrombolytic Therapy in Acute Ischemic Stroke Patients at Awal Bros Batam Hospital

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Background: Early neurological improvement (ENI) following intravenous thrombolytic therapy has been recognized as predictor of favorable functional outcome in acute ischemic stroke (AIS). This study aimed to identify the factors associated with ENI after intravenous thrombolytic therapy using recombinant tissue plasminogen activator (rtPA).

Method: We conducted 45 patients with AIS who received intravenous rtPA at Awal Bros Batam Hospital between January 2024 and December 2024. Based on the 24-hour NIHSS score change rate, patients were categorized into ENI group and without ENI group. ENI after intravenous rtPA was defined as an improvement of more than 40% in the National Institutes of Health Stroke Scale (NIHSS) score within 24 hours post intravenous rtPA. Factors associated with ENI were statistically analyzed using bivariate analysis.

Result: Based on the 24-hour NIHSS improvement rate, 28 (62,2%) of the study population had ENI. Significant statistical difference were observed in terms of admission glucose level (p 0,026) and onset-to-treatment time (p 0,017).

Discussion: Onset-to-treatment time is crucial for ENI due to better response to reperfusion therapy and lower risk of secondary brain damage. Admission glucose levels play an important role in ENI by affecting brain metabolism, inflammation, and recovery. Conclusions: This study highlights the importance of admission glucose level and onset-to-treatment time with ENI. Careful glucose monitoring and management are essential for better NIHSS improvement. Moreover, better pre-hospital strategies and door-to-needle time optimization will contribute to higher chance of ENI.

Keywords: Early neurological improvement, acute ischemic stroke, recombinant tissue plasminogen activator, onset-to-treatment time, admission glucose level

ID_109 Research Article/GP

Focal Motor Seizure Associated with Hyperglycaemic Hyperosmolar State: A Case Report and Systematic Review of Literature

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Background: Epileptic seizures in hyperglycemic hyperosmolar state (HHS) are rare but clinically significant. Limited literature exists on their pathophysiology, management, and outcomes, necessitating further investigation. This study addresses this gap through a systematic review and an illustrative case report.

Methods: This systematic review utilized electronic databases such as PubMed, ScienceDirect, and Scopus up to February 2025, following PRISMA guidelines, alongside a detailed illustrative case of the same topic is provided. Results: Fourteen studies encompassing 41 cases of focal motor seizures associated with HHS were identified. The majority of patients (51%) were female, with a mean age of 59 ± 19 years and an average random blood glucose (RBS) of 538 mg/dL. Treatment primarily involved insulin therapy, fluid resuscitation, and, in some cases, anticonvulsants. Our case report describes a 45-year-old female presenting with focal motor seizures and an RBS of 656 mg/dL.

Discussion: Upon admission, neurological and systemic examinations were unremarkable, and neuroimaging (CT scan) showed no abnormalities. Seizures resolved with insulin therapy and anti-epileptic medications, emphasizing the role of glycemic correction. However in our case, the resolution of seizures was observed solely with the anti-epileptic medications in conjunction with insulin therapy.

Conclusion: This study provides the first systematic synthesis of focal motor seizures in HHS, offering insights into their clinical characteristics and management. By combining literature review with a real-world case, we aim to enhance recognition and optimize treatment strategies.

Keywords: Focal Motor, Hyperglycaemic Hyperosmolar, HHS, Seizure

ID_110 Case Report/Resident

Evidence Based Case Report: Efficacy and Safety of Infliximab to Treat Paradoxical Tuberculous Meningitis Reactions

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Background: Despite the availability of anti-tuberculosis therapy, one of the main challenges in managing Tuberculous meningitis (TBM)is the emergence of paradoxical reactions, characterized by clinical deterioration or the appearance of new lesions during or after adequate treatment, even though the patient initially shows improvement. Additional immunosuppressive therapy with infliximab offers potential therapeutic strategy especially for patients with suboptimal response to corticosteroids.

Case summary: A 19-year-old female with definite TBM initially presented with altered mental status following recurrent seizures. Despite initial improvement with anti-tuberculosis treatment and corticosteroids, she experienced persistent headaches, fever, and worsening leptomeningeal enhancement. A paradoxical reaction (PR) was confirmed, leading to the initiation of infliximab after clinical deterioration. Following treatment, she showed significant improvement, was seizure-free, afebrile, and discharged on a tapering steroid regimen.

Discussion: Currently there are no clinical trials nor systematic review regarding infliximab as a therapeutic agent for paradoxical reaction in TBM. Five articles were obtained, which consist of three case series and two case reports. Infliximab has shown promising results as a salvage treatment for severe PR in TBM cases that do not respond to high-dose corticosteroids. As a TNF-α antagonist, infliximab helps modulate the excessive inflammatory response seen in PR without compromising tuberculosis control. Despite variations in dosage and treatment duration, clinical outcomes have been generally favorable, with significant symptom improvement and radiological resolution in most cases.

Conclusion: Although infliximab appears beneficial and safe with minimal adverse effects reported, further clinical studies needed to optimize dosing regimens and establish standardized guidelines for its application in TBM-associated PR.

Keywords: Infliximab, paradoxical reaction, tuberculous meningitis

ID_111 Case Report/GP

Subarachnoid Hemorrhage and Intraventricular Hemorrhage in an Adult with Tuberculous Meningitis and Hydrocephalus: A Rare Case Report

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Background: Subarachnoid hemorrhage (SAH) is a rare complication of tuberculous meningitis (TBM). We present a case of SAH development in an adult TBM patient during hospitalization.

Case Summary: On June 27, 2024, a 71-year-old woman presented to Polri Hospital with a sudden severe headache, nausea, photophobia, and abdominal pain, which began three hours prior to admission. She had a history of treated lung tuberculosis (2013) and comorbidities of type 2 diabetes and hypertensive heart disease. Her condition did not improve despite medication, prompting a neurologist consultation. Physical examination revealed nuchal rigidity. A head CT on July 1 showed multiple lacunar infarcts and hydrocephalus. Cerebrospinal fluid (CSF) analysis revealed elevated opening pressure, elevated CSF white blood cells, and a decreased CSF/serum glucose ratio. The patient was diagnosed with possible TBM and was enrolled in the HARVEST trial on July 4, receiving either high-dose rifampicin or a placebo. On July 6, she experienced a seizure and loss of consciousness. A repeat head CT revealed SAH and intraventricular hemorrhage. Despite craniotomy evacuation and external ventricular drainage on July 10, the patient died on July 15 from acute respiratory failure.

Discussion: The pathogenesis of SAH in TBM patients remains unclear. A possible explanation for this case is that hydrostatic pulsation against the infected arterial wall, caused by Mycobacterium tuberculosis, promoted the development of an infectious intracranial aneurysm, which subsequently ruptured and caused SAH.

Conclusion: Physicians should be aware of the potential development of SAH as a complication in TBM patients, as it can progress rapidly.

Keywords: subarachnoid hemorrhage, intraventricular hemorrhage, tuberculous meningitis, hydrocephalus, HARVEST trial

ID_112 Case Report/GP

Case Report: Successful Management of Acute Ischemic Stroke with Intravenous Thrombolysis and Implementation of Prehospital Stroke Services

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Background: Acute ischemic stroke (AIS) is a leading cause of disability and death globally. Timely administration of intravenous thrombolysis (IVT) has revolutionized AIS management, significantly improved outcomes when delivered within the therapeutic window. However, delays in diagnosis and treatment often hinder its effectiveness. The integration of prehospital stroke services, including rapid triage, telemedicine, and streamlined transport, has emerged as a critical strategy to minimize delays and optimize care delivery.

Case Summary: A 68-year-old male presented with sudden left-sided weakness and slurred speech. The CT-scan was performed 1 hour after the onset, and it showed no acute findings (ASPECTS 10). Transferred to Siloam Bali Hospital 3.5 hours post-onset, he received alteplase (67.5 mg). Door-to-needle time was 20 minutes; onset-to-needle, 3 hours 50 minutes. NIHSS improved from 11 to 2 within 30 minutes, showing rapid recovery. The case highlights the effectiveness of timely intravenous thrombolysis in acute ischemic stroke management.

Discussion: This case highlights the effectiveness of intravenous thrombolysis (IVT) and prehospital stroke services in improving patient outcomes. Timely IVT administration significantly reduced neurological deficits, demonstrating its therapeutic value. Prehospital interventions, including rapid triage and efficient transport, minimized delays, ensuring early treatment initiation. The synergy between IVT and prehospital protocols showcases a streamlined stroke care model, emphasizing its pivotal role in enhancing recovery, reducing disability, and setting a benchmark for optimal acute ischemic stroke management.

Conclusion: Combining IVT with robust prehospital stroke services enhances treatment efficiency, reduces morbidity, and improves functional outcomes. This multidisciplinary approach underscores the importance of coordinated systems in advancing stroke care.

Keywords: stroke, ischemic stroke, thrombolysis, alteplase, prehospital stroke care

ID_113 Case Report/GP

Cerebral Venous Thrombosis in Early Pregnancy Presenting with Intracranial Hemorrhage: A Case Report

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Background: Cerebral venous thrombosis (CVT) with intracranial hemorrhage in early pregnancy is an extremely rare case. Its nonspecific symptoms and signs make diagnosis challenging.

Case Summary: A 28-year-old primigravida at eight weeks of pregnancy suddenly experienced a first-ever focal seizure that recurred several times, followed by word-finding difficulties and right- sided hemiparesis in subsequent days. D-dimer was 3090 ng/mL. MR brain angiography and venography suggested cerebral venous thrombosis in the superior sagittal sinus, with an acute hematoma of 10.8 cc in the left temporal lobe. Abnormal EEG showed left temporal slowing. She received levetiracetam and intravenous continuous unfractionated heparin with targetted aPTT of 1.5-2 times. She was discharged thereafter with subcutaneous heparin 2x7,500 units. She gradually improved and regained normal neurological function and muscular strength at seven months of pregnancy. No significant complication was detected in her fetus.

Discussion: CVT occurs due to venous blood clots in the brain and can manifest in an acute, subacute, or chronic. During pregnancy, many physiologic changes occur, including increased prothrombotic proteins of the coagulation cascade and decreased anti-thrombotic proteins such as protein S. CT and MR venography are recommended non-invasive tests for confirming a diagnosis. Anticoagulant therapy is indicated in CVT patients to promote clot resolution and prevent clot expansion. CVT associated with intracranial hemorrhage should still treated with an anticoagulant.

Conclusion: The treatment goals for CVT are to recanalize the sinus, prevent thrombus propagation, and prevent pulmonary embolism. This is achieved by initiating heparin infusion or low-molecular-weight heparin (LMWH), the recommended anticoagulant during pregnancy.

Keywords: Cerebral venous thrombosis; intracranial hemorrhage; pregnancy; seizure

ID_114 Research Article/GP

Knowledges of Multiple Sclerosis and Neuromyelitis Optic among Undergraduate Health Students in Indonesia

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Background: Multiple sclerosis (MS) and neuromyelitis optica (NMO) are autoimmune inflammatory diseases of the central nervous system that can cause disability. Although rare in Indonesia, cases are increasing. Early diagnosis and treatment can reduce complications, emphasizing the need for greater awareness among primary healthcare workers.

Method: A cross-sectional study used a questionnaire with 13 and 11 binary questions for MS and NMO, respectively. A total of 182 health science students from Universitas Indonesia (RIK UI) participated. The questionnaire was validated (Pearson's product moment) and tested for reliability (Cronbach's alpha). Responses were analyzed using univariate analysis.

Results: The questionnaire was valid but had low reliability. Most respondents were 20-year-old females, mainly from the Faculty of Medicine. Third and fourth year students showed better knowledge of MS and NMO. Knowledge about MS was low, especially concerning age, drug coverage under National Health Insurance, and the recurrence. For NMO, knowledge was low regarding clinical symptoms, smoking, vitamin D, and UV exposure. Most respondents had moderate to poor knowledge.

Conclusion: RIK UI students' knowledge of MS and NMO was moderate to poor, highlighting the need for increased awareness of these diseases.

Keywords: health students, Indonesia, knowledge, multiple sclerosis, neuromyelitis optica

ID_115 Research Article/GP

Relationship Between Hypertension and Mild Cognitive Impairment at the UPTD Limo Health Center

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Background: Mild Cognitive Impairment (MCI) is a decline in cognitive function without affecting daily activities and is believed to increase with the rise of hypertension. This study aims to explore the connection between hypertension and MCI at the UPTD Limo Health Center.

Methods: This study uses a descriptive analytic design with a cross-sectional approach and accidental sampling, involving 90 respondents. Hypertension was classified based on JNC 8 guidelines, and cognitive function was measured using the Mini-Mental State Examination (MMSE) questionnaire.

Result: This study found that most respondents were aged ⩾ 60 years (52.2%), female (74.4%), and had low education levels (77.8%). Hypertension was present in 57 participants (63.3%) and MCI in 71 participants (78.9%). Among those with hypertension, 49 (69.1%) also had MCI. A statistically significant relationship between hypertension and MCI was identified (p = 0.031).

Discussion: Cognitive impairment related to hypertension develops as a result of an imbalance in the autoregulation of cerebral blood flow and structural changes in the brain blood vessels due to atherosclerosis, which ultimately leads to brain tissue damage.

Conclusion: Preventing hypertension through physical activity, avoiding smoking and alcohol, maintaining a balanced diet, and reducing the intake of high-salt foods can help reduce the risk of developing MCI.

Keywords: Hypertension, Mild Cognitive Impairment, Cognitive Function

ID_116 Research Article/Resident

Cognitive Domain Profile on Mild Cognitive Impairment Patient

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Background: Mild cognitive impairment (MCI), described as an intermediate stage of normal cognitive within dementia. MCI are classified based on the impaired domain, namely, amnestic, and non-amnestic MCI.

Methods: This is an observational cross-sectional study, conducted on 178 MCI patients who visit Neurobehaviour clinic on January – December 2023. The cognitive domains were assessed using several standarized neuropsychological tests with history taking and clinical observation.

Results and Discussion: The study showed patients' characteristics were <65 years old (74.2%). Most of the subjects were female (54,5%) with education profile for ⩾12 years (52,8%). The most observed comorbidities were cerebrovascular disease (36,5%) and hypertension (33.1%), aligned with Majoli, et. al. study regarding risk factors of MCI. MCI subtypes was majorly found as an amnestic-multi-domain (57,9%), while the 20,8% other are amnestic-single-domain MCI. These findings are different from Mansbach, et. al. study where mostly found single-domain amnestic MCI. Impaired cognitive was found in every domain, yet precentered in immediate memory (88,8%), delayed memory (75,3%), and recognition (44,9%). Impaired executive functions (11,8%) were also predominantly found in psycho/visuomotor (48,3%) and set shifting (43,3%) domain.

Conclusion: The study showed most MCI patients experienced early-onset MCI. Most observed comorbidities observed were cerebrovascular disease and hypertension, aligned with the significant risk factors of MCI. Amnestic MCI-multi-domain was the most prevalent subtypes, where most of the patients experienced cognitive impairment in immediate memory function, followed by delay memory function and psycho/visuomotor executive function. These findings lead to broader questions and trigger further studies on the pathway of MCI development in prior to dementia.

Keywords: Mild Cognitive Impairment, MOCA-INA, CERAD, TMT-A, TMT-B, Cognitive Domain Impairment

ID_117 Case Report/GP

Neurological Perspectives on Pulpitis-Induced Trigeminal Neuralgia: A Case Report

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Introduction: Trigeminal neuralgia (TN) is a disorder of the fifth cranial nerve (N. V) causing unilateral, intense, electric shock-like facial pain triggered by mild stimuli. It is commonly idiopathic but may result from vascular compression or inflammation of the V1 (ophthalmic), V2 (maxillary), or V3 (mandibular) branches. TN affects 13 per 100,000 people, more common in women (3:2), with incidence increasing with age.

Case Summary: A 35-year-old woman presented with right-sided facial pain, resembling electric shocks, persisting for six months, with each episode lasting several minutes and worsening over the past month. She had untreated dental caries in her lower jaw. Initial therapy with sodium diclofenac 50 mg twice daily, vitamin B6 once daily, and vitamin B12 once daily showed no improvement. Amitriptyline 12.5 mg once daily, methylprednisolone 4 mg twice daily, and vitamin B complex twice daily were added, leading to significant symptom relief after the third visit, while dental treatment continued.

Discussion: TN secondary to dental pulpitis occurs when inflammation stimulates the V3 branch, which innervates the dental pulp causing neuropathic pain. Mechanisms include neuroinflammation, increased nerve sensitivity, and brainstem pain modulation dysfunction. Differential diagnoses such as maxillary sinusitis, temporomandibular joint (TMJ) disorders, and atypical facial pain should be considered.

Conclusion: The diagnosis of TN is based on unilateral, electric shock-like facial pain with a history of dental infection. Treatment requires the elimination of the underlying cause. A multidisciplinary approach involving a dentist effectively reduced pain and improved masticatory function

Keywords: Trigeminal neuralgia, pulpitis, facial pain, neuropathic pain

ID_118 Case Report/GP

Traumatic Brain Injury Presenting Paraparesis Leads to Fahr's Disease: A Case Report

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Background: Fahr's disease (FD) is progressive neurological disease characterized by abnormal calcification of brain, frequently found in basal ganglia (15-20% cases). The diagnosis is usually found accidentally as it has unspecified neurological and psychiatric symptoms.

Case Summary: We reported a 64-years-old female encountered head trauma after slipped in the bathroom and complained headache, five-cm head-lump, and motoric dysfunction (paraparesis, muscle strength scale was 3). Three days before the accident, she felt weakness and numbness in both lower extremities. Laboratory blood test showed mild hypocalcemia (Calcium 8.5). Non-contrast brain CT-scan showed multiple calcifications in basal ganglia without hemorrhage or fracture. She was diagnosed FD and was given neuroprotectants, vitamins, analgesics, and antihypertensive which led to improvement on motoric strength scale (increased to 4) after six days hospitalization.

Discussion: The specific pathophysiology of FD is still unknown. A Study of 7344 brain CT-scans done for brain injury patients showed 13 patients had bilateral symmetrical striopallidodentate calcification. Some studies showed patients have locally altered blood-brain-barrier which progressive calcification compresses nearby vessels, reduces blood flow, and increases tissue injury to mineral deposition. This pathophysiology may contributes to our patient condition. Nowadays, study mentioned potential treatment such as bisphosphonate therapy (Alendronate) which inhibits osteoclasts and vitamin D therapy which can reduced calcifications in the brain.

Conclusion: FD revealed after traumatic brain injury is a rare case. Based on these studies, our patient had FD based on possible local blood-brain-barrier damaged caused by traumatic effect and her mild hypocalcemia.

Keywords: Fahr Disease, Traumatic brain injury, progressive neurological disease, brain calcification, Calcium deposit.

ID_119 Research Article/GP

Pharmacological and Non-Pharmacological Therapy for Non-Arteritic Anterior Ischemic Optic Neuropathy: A Systematic Review and Meta-Analysis

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Background: Non-arteritic anterior ischemic optic neuropathy (NAAION) is a major cause of vision impairment in the elderly due to disrupted optic nerve blood flow. Currently, no standard treatment exists. This systematic review and meta-analysis evaluate the effectiveness of pharmacological and non-pharmacological therapies for NAAION.

Methods: A systematic search was conducted in PubMed, Scopus, ScienceDirect, Web of Science, and Taylor & Francis until January 24, 2025. Studies meeting eligibility criteria underwent screening, risk of bias assessment, and meta-analysis using a random-effects model to evaluate visual acuity (logMAR) and visual field outcomes.

Results: Thirty-two studies (1690 patients) were included in the systematic review, and eight studies were analyzed in the meta-analysis. Corticosteroids improved visual acuity by reducing logMAR values (SMD: -0.36 [95% CI: -0.51, -0.20], I^2 = 65%) but had no significant effect on the visual field (p = 0.68). Dopamine precursors also improved visual acuity (SMD: -0.38 [95% CI: -0.61, -0.14], p = 0.002, I2 = 0%) but not visual field (p = 0.68). VEGF inhibitors showed no significant effect on either (p > 0.05).

Discussion: Corticosteroids and dopamine precursors may enhance visual acuity through anti-inflammatory and neuroprotective mechanisms, respectively, while VEGF inhibitors showed no meaningful benefit. The high heterogeneity stemmed from the different dosages given and time of follow-up.

Conclusion: Corticosteroids and dopamine precursors may improve visual acuity in NAAION, but no treatment significantly affects the visual field. Large-scale trials are needed to refine treatment strategies.

Keywords: corticosteroid, dopamine precursor, non-arteritic anterior ischemic optic neuropathy, VEGF inhibitors, visual acuity, visual field

ID_120 Research Article/Medical Student

Efficacy of Viltolarsen in Improving Motor Function in Duchenne Muscular Dystrophy: A Systematic Review and Meta-Analysis

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Background: Duchenne Muscular Dystrophy (DMD) is one of the most severe and common hereditary neuromuscular disease. It is inherited as an X-linked recessive trait and presents with muscle weakness that progresses significantly, often leading to complete wheelchair dependence. Viltolarsen, an exon 53 skipping therapy, has shown promise in randomized controlled trials (RCTs) as a potential treatment for DMD.

Methods: We conducted a comprehensive literature search across PubMed, Cochrane Library, Embase, and ClinicalTrials.gov on viltolarsen usage in DMD treatment. We included RCTs which included time to stand from supine (TTSTAND), time to climb 4 stairs (TTCLIMB), and time to run/walk 10 meters (TTRW) as their outcome. Outcomes were extracted and processed using meta package in RStudio.

Result: A total of 2 RCTs were included in the study, comprising a pooled sample of 162 patients. Viltolarsen decreased TTSTAND compared to control group DNHS (-1.13 MD; 95% CI -2.34 – 0.08) and decreased TTCLIMB (-0.69 MD; 95% CI -1.34 – -0.04), but did not show improvement in TTRW (0.28 MD; 95% CI -0.54 – 1.10).

Discussion: Viltolarsen appears to improve motor function, particularly in TTSTAND and TTCLIMB. Improvement suggests that viltolarsen may be able to slow disease progression. However, due to high heterogeneity and the limitation of research samples, further research in the subject is needed. **Conclusion:** Viltolarsen demonstrates improvement in motor function in DMD patients. Findings support the potential of viltolarsen as a treatment for patients with DMD.

Keywords: viltolarsen, duchenne muscular dystrophy, efficacy

ID_121 Research Article/GP

Headache Profile in Patients with Positive Migraine Vascular Index (MVI) Assessment: A Retrospective Study

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Introduction: Diagnosis of migraine currently relies on subjective criteria set by the International Headache Society (IHS), which have limitations. The Migraine Vascular Index (MVI), a novel method evaluating cerebrovascular reactivity through transcranial Doppler (TCD), shows potential as an objective diagnostic tool for migraine.

Methods: This descriptive quantitative study was conducted at Neurology Outpatient Clinic of Dr. Cipto Mangunkusumo Hospital from January to December 2024. We included migraine patients tested with IVM based on ICHD-3 criteria. Data was analyzed, focusing on demographics, headache characteristics, and MVI results. Results: Of the 37 patients examined, 24 showed positive MVI results, with 84% females and an average age of 37. Migraine with aura (50%) was most common among those with positive MVI results, including brainstem aura (29%) and typical aura (21%). Migraine without aura (42%) and chronic migraine (8%) were also observed. Migraine with aura most often showed positive MVI in the right middle cerebral artery. Migraine without aura had similar results in both left and right middle cerebral arteries, while chronic migraine showed positivity in both. Forty percent of patients with positive MVI in both arteries experienced alternating-sided pain. Unilateral MVI positivity correlated with ipsilateral migraines in 42.8% of left artery cases and 42.8% of right artery cases.

Discussion: MVI shows promise as an objective diagnostic tool, especially in atypical cases. Positive MVI results are linked with migraine aura and headache location, though pain side-shifting occurs.

Conclusion: The MVI is an effective tool for diagnosing migraine, particularly in patients with unclear symptoms.

Keywords: Migraine Vascular Index, Headache Characteristics.

ID_122 Case Report/GP

Cerebral Toxoplasmosis In HIV/ AIDS Patient : Case Report

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Background: Toxoplasma gondii infects approximately one-third of the world's population , including >13 million human immunodeficient virus (HIV) infected people, causing brain inflammation and various other diseases. Toxoplasma gondii infection in the central nervous system commonly occurs among immunodeficient patients. The definitive diagnosis requires demonstration of toxoplasma in brain tissue. However, neuroradiologic demonstration of ring-enhanced multiple or single focal intracranial lesions in the presence of immunosuppression and prompt response to presumptive therapy are diagnostic in the absence of histological facilities.

Case summary: A 29 year old female patient with HIV positive since 2020 was receiving anti retroviral therapy only one years after that never consumed. Patient presented with persistent vertigo, headache and sometimes disturbance in memory. Neurological evaluation revealed an intact sensorium with a slightly slurred speech, no ocular nystagmus. There were no cranial neuropathy, signs of meningeal or primitive reflexes. Laboratory in normal limits. Neurologic CT revealed multiple enhancing with oedem vasogenic at cortex and subcortex temporo-occipital lobe sinistra, parietal lobe sinistra and cerebellum dextra suggestive of cerebral toxoplasmosis. Treatment included cotrimoxazole, clindamysin, steroids, mannitol, ARV and supportive therapy, leading to clinical improvement.

Discussion: This case highlights the importance of considering cerebral toxoplasmosis in HIV/AIDS patients presenting with cerebral and cerebellar dysfunction. Early detection through imaging and serological testing is crucial for timely intervention.

Conclusion: Effective management with antimicrobial therapy and supportive care can lead to significant clinical improvement, emphasizing the need for prompt diagnosis and targeted treatment in similar cases.

Keywords: Cerebral toxoplasmosis; Toxoplasma, HIV/AIDS; CT Scan

ID_123 Case Report/Resident

Diagnostic Approach of Distal Myopathy: A Case Report

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Background: Desmin myopathy is a rare autosomal dominant and recessive hereditary myofibrillar distal myopathy caused by a pathogenic variant in DES. It is often misdiagnosed as neurogenic instead of myogenic lesion.

Case Summary: A 28-year-old Indonesian male presented with painless progressive lower motor neuron left foot drop and hoarseness for two years. Sensory, autonomic functions, and past medical history were unremarkable. Patient's father, paternal aunt, and paternal cousin were similarly affected, suggesting autosomal dominant inheritance. Electrodiagnosis revealed reduced compound muscle action potential amplitude of peroneal extensor digitorum brevis muscle, normal sensory nerve action potential, and widespread myogenic lesions affecting predominantly distal and proximal upper and lower limbs. Creatine kinase (CK) level was 559 U/L. Muscle MRI showed bilateral fatty infiltration primarily affecting the peroneal, followed by soleus, gastrocnemius, and anterior tibial, and selectively semitendinosus muscles. Whole exome sequencing (WES) identified heterozygous reported pathogenic variant in DES (p.Leu345Pro).

Discussion: Muscle weakness without sensory involvement should be distinguished between myogenic and neurogenic. Specific entity of myopathy can be identified by distinct muscle involvement pattern. Early peroneal muscle and posterior compartment involvement, with relative sparing of anterior tibialis, indicates diagnosis of desminopathy. Hoarseness, rare in desminopathy, suggests differential diagnosis of Vocal Cord and Pharyngeal Weakness. Mild CK elevation in ambulant patients excludes dysferlinopathy or anoctaminopathy. Desminopathy was confirmed by WES and cardiac assessment is suggested.

Conclusion: Recognition of desminopathy through clinical sign of distal weakness, electromyography, muscle MRI, and genetic testing is crucial to avoid unnecessary diagnostic panels and treatment. Cardiac assessment and genetic counselling are recommended.

Keywords: Desmin Myopathy, Distal Myopathy

ID_124 Research Article/GP\

Comparing the Short-Term Efficacy of a Single Epley Maneuver vs. a Single Semont Maneuver for Adult Posterior Canal Benign Paroxysmal Positional Vertigo: A Systematic Review of Randomized Controlled Trials

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Background: Epley and Semont maneuvers are treatments for posterior canal benign paroxysmal positional vertigo (pcBPPV). This study aimed to compare the short-term efficacy of a single Epley maneuver with the single Semont maneuver for adult pcBPPV.

Method: A literature search was performed on January 17, 2025, across four databases using relevant search terms. After removing duplicates, literature screenings were conducted and the RoB-2 tool was used to assess bias. Data extraction included the mean age, affected side of pcBPPV, and the success rate of free positional vertigo attacks immediately and one week after each single maneuver.

Result: Out of 373 papers screened, three papers met our eligibility criteria, including a total of 205 patients with pcBPPV. The total mean age of the Epley group and the Semont group was 57.1 ± 11.74 years and 47.44 ± 12.14 years, respectively. The Epley maneuver had a higher success rate for free positional vertigo attacks both immediately after a single maneuver and one week after, compared to the Semont maneuver (77.7% vs. 68.6%) (data from three studies) and (93.4% vs. 80.6%) (data from two studies).

Discussion: Our study found that the Epley group had higher short-term vertigo resolution rates compared to the Semont group. The Epley maneuver results in fewer symptoms after treatment, while the Semont maneuver is easier to perform and is therefore recommended for individuals who cannot attend the hospital. Conclusion: The Epley maneuver was more effective for
short-term vertigo resolution compared to the Semont maneuver in treating pcBPPV.

Keywords: Epley Maneuver, Semont Maneuver, posterior canal BPPV, randomized controlled trial, short-term efficacy

ID_125 Research Article/GP

Effectiveness and Risks of Ticagrelor-Aspirin Versus Clopidogrel-Aspirin in Preventing Recurrent Stroke in CYP2C19 LOF Carriers: A Meta-Analysis of Randomized Trials

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Background: Patients with transient ischemic attack (TIA) are at high risk of subsequent strokes, particularly in the short term. Dual antiplatelet therapy has shown efficacy in reducing ischemic events but increases the risk of major bleeding. This systematic review and meta-analysis aim to evaluate the benefits and risks of ticagrelor-aspirin versus clopidogrel-aspirin in CYP2C19 loss-of-function (LOF) carriers with TIA.

Methods: A comprehensive literature search was conducted across multiple databases (PubMed, Google Scholar, Scopus) up to October, 2024. Randomized controlled trials (RCTs) comparing ticagrelor-aspirin versus clopidogrel-aspirin in TIA patients who are CYP2C19 LOF carriers were included. The incidence of new ischemic or hemorrhagic stroke at 90 days, vascular events, intracranial hemorrhage, and mortality was assessed using Risk Ratios (RR) with 95% confidence intervals (CI). The study is registered with PROSPERO under registration number CRD420251002523.

Result: Twelve studies involving 64,128 TIA patients with CYP2C19 LOF alleles were included. The ticagrelor-aspirin combination significantly reduced recurrent stroke incidence (RR: 0.72; 95% CI, 0.65-0.80; $P < 0.001$), composite vascular events (RR: 0.74; 95% CI, 0.70-0.79; $P < 0.00001$), intracranial hemorrhage (RR: 0.50; 95% CI, 0.31-0.82; $P = 0.005$), and mortality (RR: 0.53; 95% CI, 0.39-0.71; $P < 0.0001$) compared to clopidogrel-aspirin.

Discussion: Ticagrelor-aspirin therapy demonstrated superior efficacy in reducing stroke recurrence and mortality. The increased bleeding risk should be balanced with its benefits, emphasizing the need for genetic screening of CYP2C19 LOF alleles to personalize treatment.
Conclusion: Ticagrelor-aspirin therapy offers significant benefits over clopidogrel-aspirin in reducing recurrent strokes, vascular events, and mortality in CYP2C19 LOF carriers with TIA.

Keywords: Dual Antiplatelet Therapy, Ticagrelor, Clopidogrel, Transient Ischemic Attack, CYP2C19 Loss-of-Function

ID_126 Research Article/Student

Evaluating the Efficacy of Pharmacological Treatments for Alzheimers Disease: A Systematic Review and Network Meta-Analysis of ADAS-Cog 13 Outcomes

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Background: Alzheimer's disease (AD) is a progressive neurodegenerative disorder. Currently there are not many drugs to treat mild to moderate AD and their values are controversial. Our main objective is to determine the efficacy profile of several drugs that show significant change to ADAS-Cog 13-item scale.

Method: We conducted a comprehensive literature search across PubMed, Cochrane Library, Embase, and ClinicalTrials.gov for randomized controlled trials (RCTs) evaluating pharmacological treatments for AD. We included RCTs which includes clinically significant changes in ADAS-Cog 13-item scale as their outcome. Outcomes were extracted and processed using meta package in RStudio.

Result: 4 RCTs were included with a total of 2619 participants. The efficacy of donepezil, rivastigmine, sodium benzoate, and solanezumab were compared to placebo. Out of all drugs, rivastigmine showed the best improvement (-2.20 MD; 95% CI -3.04 -1.36), followed by solanezumab (-1.13 MD; 95% CI -1.19; -1.07), and donepezil 5 mg (-0.62 MD; 95% CI -0.09 0.19). Sodium benzoate showed very high heterogenicity and thus insignificant results (-1.30 MD; 95% CI -6.96 4.36). Donepezil 10 mg showed no significant difference (0.05 MD; 95% CI -0.09 0.19).

Discussion: All drugs except donepezil 10 mg and sodium benzoate showed significant improvement in ADAS-Cog. Heterogenicity and lack of efficacy in those treatments draw a need for further research. Result shows a possibility to recommend discontinuation of donepezil 10 mg treatment for AD.

Conclusion: Rivastigmine showed the best improvement for ADAS-Cog 13 compared to donepezil, rivastigmine, sodium benzoate, and solanezumab. Donepezil 10 mg shows no significant result compared to placebo.

Keywords: donepezil, rivastigmine, sodium benzoate, solanezumab, Alzheimer's disease, efficacy

ID_127 Case Report/GP

The Great Imitator Strikes Again: Tuberculosis Presenting as Longitudinally Extensive Transverse Myelitis

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Background: Central nervous system (CNS) tuberculosis is rare but can be life-threatening, with a mortality or disability rate of 50%. Transverse myelitis, an uncommon tuberculosis complication, can extend to three or more vertebral segments, meeting the criteria for longitudinally extensive transverse myelitis (LETM)—a hallmark of neuromyelitis optica spectrum disorder (NMOSD). Distinguishing tuberculosis-related LETM from NMOSD-related LETM is crucial for proper treatment.

Case Summary: A 38-year-old woman presented with a severe headache, nausea, meningeal signs, quadriparesis, hyporeflexia, and hypesthesia in both legs, along with persistent constipation during hospitalization. Spinal magnetic resonance imaging (MRI) revealed LETM spanning three or more vertebral segments. Cerebrospinal fluid (CSF) analysis revealed elevated protein, low glucose, pleocytosis dominated by mononuclear cells, and a positive GeneXpert test, confirming tuberculous meningitis and tuberculous LETM. She was treated with anti-tubercular therapy (ATT) and dexamethasone, achieving full recovery (Modified Rankin Scale 0) within nine months.

Discussion: Tuberculous myelitis usually presents with short-segment lesions, whereas LETM is more characteristic of NMOSD. The patient's excellent response to ATT, along with diagnostic findings pointing to tuberculosis, suggests Mycobacterium tuberculosis as the cause of LETM rather than an immune-mediated process. Differentiating tuberculosis-related LETM from NMOSD is critical, as their treatment approaches differ significantly.

Conclusion: This case highlights the diagnostic challenge of tuberculosis-related LETM and underscores the importance of early recognition and accurate differentiation from NMOSD to ensure appropriate treatment and prevent permanent neurological damage.

Keywords: Tuberculous meningitis, Tuberculous myelitis, Longitudinally extensive transverse myelitis, Neuromyelitis optica spectrum disorder mimicry, Central nervous system tuberculosis

ID_128 Case Report/GP

Unlikely Culprit: A Rare Case of Proteus mirabilis Brain Abscess in an Immunocompetent Adult

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Background: Proteus mirabilis is a common cause of urinary tract and ear infections but rarely leads to brain abscesses. These infections primarily affect neonates or immunocompromised individuals, making cases in immunocompetent adults uncommon and diagnostically challenging.

Case Summary: A 35-year-old immunocompetent male presented with a four-day history of vertigo and vomiting. Two months earlier, he had undergone ventriculoperitoneal (VP) shunt placement for hydrocephalus caused by a left ear infection. Brain magnetic resonance imaging (MRI) revealed a 4.7 × 5.2 × 3 cm ring-enhancing lesion in the left cerebellum with perifocal oedema. Burr hole drainage yielded purulent material, and cultures confirmed Proteus mirabilis. He was diagnosed with a brain abscess related to his VP shunt. He was treated with intravenous ceftriaxone and metronidazole but later developed hemiataxia. As his condition improved, he was discharged on oral co-amoxiclav and metronidazole, though mild hemiataxia persisted.

Discussion: Brain abscesses due by Proteus mirabilis are rare in immunocompetent adults. In this case, the VP shunt placement likely facilitated bacterial migration into the central nervous system. MRI findings supported the diagnosis, necessitating surgical drainage and targeted antibiotic therapy. Despite improvement, mild hemiataxia highlights the need for ongoing monitoring.

Conclusion: This case highlights a rare Proteus mirabilis brain abscess in an immunocompetent adult. Early diagnosis, timely surgical intervention, and appropriate antimicrobial therapy are crucial for effective management and recovery.

Keywords: Brain abscess, Proteus mirabilis, Immunocompetent adult, Ventriculoperitoneal shunt, Surgical drainage

ID_129 Case Report/GP

Ischemic Stroke in Tetralogy of Fallot Patient with Polycythemia: Treatment Consideration

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Background: Tetralogy of Fallot (ToF) is the most common cyanotic congenital heart disease (CCHD), comprising ~10% of congenital heart disease (CHD) cases. ToF patients have an increased risk of ischemic and hemorrhagic strokes, often due to secondary polycythemia (SP). This case demonstrates the dilemma of managing ischemic stroke in ToF patients due to the interplay between polycythemia, anticoagulation, and underlying cardiovascular abnormality.

Case Summary: A 44-year-old male with Tetralogy of Fallot (ToF) presented with sudden right-sided numbness, weakness, and slurred speech. Physical examination revealed right-sided facial paresis, motor deficits (4/4 strength on the right, 5/5 on the left), a heart murmur, and digital clubbing. Laboratory tests showed increase in hemoglobin (19.5 g/dL), hematocrit (68.0%), erythrocyte count (9.3 × 10^6/µL), with decrease in MCV (73.0 fL), MCH (20.9 pg), and MCHC (28.7 g/dL). A non-contrast head CT confirmed an acute infarct in the left corona radiata, indicating ischemic stroke. The patient received IV fluids for hemodilution, antiplatelets, and hematologic monitoring.

Discussion: ToF increases stroke risk via hyperviscosity, paradoxical embolism, and in situ thrombosis. Right-to-left shunting leads to chronic hypoxemia, stimulating erythropoiesis and polycythemia, which heightens thrombotic risk. While ischemic stroke follows standard management, the American Heart Association (AHA) recommends hemodilution. Phlebotomy and aspirin help prevent recurrence but require caution, as iron deficiency may worsen viscosity. Hydroxyurea has limited but potential benefits.

Conclusion: Managing ischemic stroke in ToF requires an individualized assessment, balancing thrombotic and bleeding risks. A multidisciplinary team—including neurologists, cardiologists, and hematologists—is essential to optimize hydration, phlebotomy, and thromboprophylaxis. Disclosure/conflict of interest: none

Keywords: Ischemic Stroke, Tetralogy of Fallot, Cyanotic Congenital Heart Disease, Secondary Polycythemia, Phlebotomy

ID_130 Research Article/GP

Molecular Mechanism of Temozolotemide Resistant Glioblastoma: a Bioinformatics Analysis

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Background: Glioblastoma is the most common brain tumor in adults, with a median survival of 15 months. Treatment involves surgery and temozolomide, which increases survival by only 2 months. Due to frequent mutations, over 50% of patients develop temozolomide resistance, yet its molecular mechanism remains unclear. This study aims to identify key hub genes associated with glioblastoma and their potential as biomarkers for temozolomide-resistant glioblastoma.

Methods: Two RNA-sequencing datasets (GSE234762 and GSE193957) were retrieved from the Gene Expression Omnibus (GEO) database. Differentially expressed genes (DEGs) were analyzed using GEO2R, followed by Gene Ontology and pathway enrichment analysis via the SRPlot tool. Cytoscape's CytoHubba plugin was used to examine protein-protein interactions and identify the top 10 hub genes.

Results: A total of 116 common DEGs were identified, with 57 upregulated and 59 downregulated genes. Upregulated genes were associated with epithelial tube morphogenesis, microfibril activity, and cAMP response element binding, while downregulated genes were linked to sulfur biosynthesis, brush border membrane, and amino acid binding. Pathway analysis revealed a connection between the IL-17 signaling pathway and temozolomide-resistant glioblastoma. The PPI and CytoHubba analysis identified 10 hub genes: IL6, FOS, MET, FOSL1, JUN, DUSP1, KLF6, NES, GDNF, and GDF15.

Discussion: Temozolomide resistance in glioblastoma involves MGMT overexpression, IL-17 and PI3K/AKT signaling, and metabolic shifts. Targeting IL-6 or MET pathways may enhance TMZ sensitivity, offering potential therapeutic strategies.

Conclusion: This bioinformatics analysis identified hub genes that may help clarify the molecular mechanisms of temozolomide resistance in glioblastoma.

Keywords: Glioblastoma, Telozomide resistancy, Bioinformatics

ID_131 Case Report/GP

Acute Ischemic Stroke in Obese Immobilized-Post Lumbal Laminectomy Patient: A Case Report

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Background: Postoperative stroke occurred in 0.22% of patients undergoing spinal surgery, with most cases classified as ischemic strokes. Risk factors for postoperative stroke include advanced age, history of stroke, and ascending aorta atherosclerosis.

Case Summary: A 54-year-old female presented with a sudden onset of right-sided weakness and difficulty speaking on the third day after postoperative care following a laminectomy for lumbar hernia nucleus pulposus. The patient had limited mobility due to postoperative pain and obesity. She had a history of hypertension and diabetes, both well-managed with routine medications. A head MRI revealed an infarction in the left frontoparietal region, leading to a diagnosis of acute ischemic stroke, for which appropriate treatment was initiated.

Discussion: Postoperative acute ischemic stroke (PAIS) results from cerebral blood flow obstruction, leading to ischemia and infarction. Each unit increase in BMI over 20 kg/m^2 raises PAIS risk by 5%. Patients with risk factors are more prone to atherosclerotic events in the carotid and cerebral arteries. Motor impairment from PAIS may cause muscle wasting, while reduced mobility increases the risk of deep vein thrombosis and pulmonary embolism. Anticoagulant therapy is commonly used to reduce embolism risk.

Conclusion: Beyond traditional stroke risk factors, postoperative immobilization must be considered. Comprehensive evaluation and anticoagulant therapy before and after surgery are essential for stroke prevention. Disclosure/ conflict of interest: none

Keywords: Acute Ischemic Stroke, Risk Factors, Embolism, Postoperative

ID_132 Research Article/Medical Student

Neuroprotective Potential of Polyphenol-Rich Food and Supplementation: A Network Meta-Analysis in Cognitive Declined Patients

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Background: Neurodegenerative diseases pose a growing global burden, necessitating novel strategies for cognitive preservation and neurovascular protection. Polyphenol-rich foods, including anthocyanins, resveratrol, and flavonoids, have demonstrated potential neuroprotective properties, yet their comparative efficacy remains unclear. This network meta-analysis evaluates the impact of these compounds on cognitive performance and neurovascular function.

Methods: A network meta-analysis of randomized controlled trials (RCTs) was conducted to assess the effects of anthocyanins, resveratrol, flavonoids, and their synthetic derivatives on episodic memory, executive function, hippocampal-dependent cognition, and cerebrovascular markers with netmeta package on RStudio. Standardized mean differences (SMDs) and 95% confidence intervals (CIs) were analyzed.

Results: Wild blueberry extract significantly enhanced endothelial function (FMD: 0.86%; 95% CI: 0.56, 1.17; $P < 0.001$) and reduced systolic blood pressure (-3.59 mmHg; 95% CI: -6.95, -0.23; $P = 0.067$), supporting its role in neurovascular health. It also improved executive function ($P < 0.05$) and mitigated cognitive fatigue. Purified anthocyanins showed a 1.4-point increase in episodic memory scores (95% CI: -0.9, 3.7; $P = 0.23$), with an improvement trend over 24 weeks ($P = 0.27$). Flavanol supplementation demonstrated hippocampal-dependent memory restoration in individuals with low habitual intake ($P=0.04$), reinforcing its potential in cognitive aging and neurodegenerative risk reduction. Discussion The findings highlight polyphenols as promising adjuncts in neuroprotection, particularly in cognitive decline prevention. While synthetic anthocyanins show emerging benefits, further investigations are warranted.

Conclusion: Polyphenol-rich foods exert significant neuroprotective and cerebrovascular benefits, with potential implications for delaying neurodegeneration. Future studies should optimize dosage strategies and explore synergistic effects with pharmacological interventions.

Keywords: Polyphenols, anthocyanins, neuroprotection, cognitive aging

ID_133 Case Report/GP

Leptomeningeal Metastases in Multiple Myeloma: A Case Report

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Background: Intracranial metastases in multiple myeloma (MM) are rare, with manifestations including solitary plasmacytoma and leptomeningeal metastases (LM). LM is an often fatal complication of MM, characterized by malignant infiltration of the meninges and cerebrospinal fluid (CSF). Its nonspecific neurological symptoms cause LM to be frequently underrecognized, leading to delays in diagnosis and management.

Case summary: A 76-year-old male with MM presented with altered consciousness and focal seizures progressing to generalized seizures. Neurological examination revealed a Glasgow Coma Scale of E2M5V3, with no focal deficits. The brain MRI with contrast showed leptomeningeal enhancement in the right frontotemporal region, highly suggestive of LM. Due to the patient\'s critical condition, lumbar puncture for CSF analysis could not be performed. The patient was managed with high-dose corticosteroids and antiseizure medications. Despite supportive treatment, his condition deteriorated, reflecting the poor prognosis associated with LM in MM.

Discussion: Intracranial metastases in MM can manifest as solitary plasmacytoma, dural infiltration, or LM, the least common but most severe. The pathogenesis involves hematogenous spread, direct invasion, or blood-brain barrier disruption. Diagnosis is challenging, requiring MRI and CSF analysis, though CSF is not always feasible. Management includes corticosteroids, systemic and intrathecal chemotherapy, and palliative care, but overall survival remains limited to weeks or months.

Conclusion: LM in MM should be suspected in patients with unexplained neurological symptoms. Early diagnosis using MRI and CSF analysis is crucial, but treatment is mainly palliative due to poor prognosis. Recognizing LM in MM patients ensures timely supportive care and symptom management. Disclosures/ conflict of interest: none

Keywords: Multiple Myeloma, Leptomeningeal Metastases, Intracranial Metastases

ID_134 Case Report/GP

Hypercalcemia Event in Unconscious Cancer Patient: A Case Report

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Background: A disturbance in calcium ions affects memory consolidation, cognitive processes, and synaptic activity. This case highlights the importance of considering hypercalcemia although it rarely happens.

Case Summary: A 56-year-old female with advanced breast cancer metastasizing to the cranial bone, liver, and lung came with altered consciousness due to hypercalcemia. Initial examination showed GCS E2V2M4 with no fever, headache, seizures, or unilateral weakness. Laboratory tests revealed increase in ureum levels (167 mg/dL), creatinine (2.16 mg/dL) and Ca Total (17 mg/dL). A non-contrast CT scan revealed multiple geographic lytic lesions in the bilateral frontoparietal, temporal, and occipital bones. The patient received symptomatic and palliative treatment for three days before discharge to home-care.

Discussion: A study by Tuma et al. reported that a single cause of altered consciousness is found (33%) while multifactorial (67%) including drug especially opioids (64%), metabolic abnormalities (53%), infections (46%), recent surgery (32%), structural brain-lesion (15%). Hypercalcemia happens 10-30% with 50% mortality rate within 30-days. Symptoms range from anxiety, depression, and cognitive impairment in mild cases to psychosis, confusion, lethargy, and coma in severe cases.

Conclusion: Hypercalcemia is rare etiologies for altered consciousness in cancer patients but given the prognosis-rate, it is recommended to consider hypercalcemia as the cause. Disclosure/ conflict of interest: none

Keywords: Hypercalcemia, Cancer, Altered Consciousness

ID_135 Research Article/Medical Student

Evaluating the Efficacy of Anti-Amyloid-β Antibodies in Alzheimer's Disease: A Network Meta-Analysis of Cognitive and Functional Outcomes

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Background: Monoclonal antibodies against amyloid-β in Alzheimer's disease (AD) treatments show variable efficacy. Our main objective is to compare the efficacy of anti-Aβ antibodies by comparing mean change in ADAS-Cog 13-item scale and CDR-SB.

Methods: We conducted a comprehensive literature search across PubMed, Cochrane Library, Embase, and ClinicalTrials.gov for randomized controlled trials (RCTs) evaluating anti-Aβ antibodies for AD. We included phase III RCTs with changes in ADAS-Cog 13-item scale and CDR-SB as their outcome. Outcomes were extracted and processed using meta package in RStudio.

Result: 12 RCTs were included, comparing the efficacy of donanemab, gantenerumab, bapinezumab, solanezumab, aducanumab, and crenezumab. Solanezumab (-0.64 MD; 95% CI -1.93 -1.37), gantenerumab 510 mg (-1.28 MD; 95% CI -1.49 -1.04), and aducanumab (-0.64 MD; 95% CI -0.87 -0.42) showed significant changes in ADAS-Cog 13-item scale. All antibodies showed a worsening trend in CDR-SB with insignificant changes. Crenezumab (0.17 MD; 95% CI -0.27 0.61), gantenerumab 105 mg (0.09 MD; 95% CI -0.52 0.70), and gantenerumab 225 mg (0.13 MD; 95% CI -0.48 0.74) showed worse CDR-SB compared to placebo.

Discussion: The discrepancy between ADAS-Cog and CDR-SB suggests that while anti-Aβ antibodies may provide some cognitive benefits, they do not appear to halt overall functional decline. The worsening CDR-SB scores raise concerns about the clinical utility and calls for further research.

Conclusion: Solanezumab, gantenerumab 510 mg, and aducanumab demonstrates cognitive improvements on the ADAS-Cog 13-item scale. No anti-Aβ antibody showed a significant benefit in slowing functional decline. Crenezumab and gantenerumab showed worsening in CDR-SB.

Keywords: donanemab, gantenerumab, bapinezumab, solanezumab, aducanumab, crenezumab, Alzheimer's disease, efficacy

ID_136 Research Article/Medical Student

Effects of Acupuncture on Health-Related Quality of Life and Motor Symptoms in Parkinson's Disease: A Systematic Review and Meta-Analysis

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Background: Parkinson's disease is a neurodegenerative disorder caused by basal ganglia nerve cell degeneration. Its worsening symptoms reduce patients' quality of life. Acupuncture treatment helps alleviate symptoms, leading to an improved quality of life for patients. This alternative therapy offers potential benefits in managing Parkinson's disease symptoms and enhancing overall well-being.

Methods: Authors followed PRISMA guidelines across five databases (searched until March 5, 2025) using the keywords "Acupuncture", "Parkinson's Disease", "PDQ-39", "UPDRS-M". Randomized Controlled Trials (RCTs) comparing acupuncture, including traditional and electroacupuncture, to sham acupuncture or conventional pharmacological treatment were included. Study quality was assessed using the Cochrane RoB 2.0 tool. Meta-analysis was performed using Review Manager 5.4.1.

Results and Discussions: Seven RCTs involving 432 participants were included. Parkinson's Disease Questionnaire-39 (PDQ-39) (SMD = -0.82, p = 0.04, 95% CI: -1.58 to -0.06) showed that acupuncture significantly improved health-related quality of life in Parkinson's disease patients. Additionally, Unified Parkinson's Disease Rating Scale-Motor (UPDRS-M) (SMD = -0.59, p = 0.02, 95% CI: -1.08 to -0.10) demonstrated that acupuncture significantly reduced motor-related symptoms. However, heterogeneity was high (I^2 = 91% and I^2 = 63%, respectively), suggesting variability among studies. Risk of bias assessment revealed concerns in randomization and outcome measurement. However, bias due to deviations from intended intervention and missing data are generally low.

Conclusion: These findings suggest that the implementation of acupuncture increases the health-related quality of life of Parkinson's disease patients, and reduces motor-related symptoms. Despite this, further trials need to be conducted to assess the significance of the results obtained.

Keywords: Acupuncture, Parkinson's Disease, PDQ-39, UPDRS-M

ID_137 Research Article/GP

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. This study aimed to analyse the diagnostic accuracy of machine learning in predicting epileptic seizure using data of iEEG.

Method: 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. Result: 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

ID_138 Research Article/GP

Baseline DISINI Score as a Predictor of Neuropathic Pain Reduction in Diabetes Mellitus

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Background: Diabetic neuropathy (DN) is a common complication of type 2 diabetes mellitus (T2DM), significantly impacting life quality. The Distal Symmetric Neuropathy (DISINI) tool may help predict pain reduction in affected patients.

Methods: This cross-sectional study included T2DM patients with DN receiving vitamin D 5000 IU. Baseline DISINI scores were recorded, and pain reduction was assessed using the Subjective Global Assessment (SGA), rated from 1 (>50% pain reduction) to 5 (worsened pain). Ordinal regression analysis was performed.

Results: Among 31 subjects, most were female (64.5%), elderly (74.2%), and had T2DM for ⩾5 years (51.6%), with well-controlled diabetes (90.3%). The median DISINI score was 4 (2–6), with 23 subjects having DN (74.2%). Ten subjects (30.3%) reported significant improvement. The model demonstrated a good fit ($p = 0.777$), but all pseudo-R^2 indicators suggested low explanatory power. The proportional odds assumption was met, confirming model validity. DISINI did not significantly predict pain reduction ($b = -0.008$, $SE = 0.218$, $Wald = 0.001$, $p = 0.971$).

Discussion: Despite its clinical relevance, DISINI failed to predict neuropathic pain reduction, likely due to multifactorial mechanisms, small sample size, or vitamin D's variable efficacy. Although the model met validity assumptions, its low explanatory power suggests that extra predictors are necessary. More extensive and larger studies are needed to create predictive models in DN management.

Conclusion: Baseline DISINI scores alone cannot predict neuropathic pain reduction in T2DM patients receiving vitamin D. A multifactorial approach with broader biomarkers and clinical parameters is needed to improve prognostic accuracy

Keywords: diabetic neuropathy, neuropathic pain, DISINI, vitamin D, predictive modeling

ID_139 Research Article/GP

Lactate Dehydrogenase as a Potential Prognostic Biomarker in Subarachnoid Haemorrhage: A Systematic Review

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Background: Subarachnoid hemorrhage (SAH) lacks specific prognostic blood markers, but lactate dehydrogenase (LDH), linked to cellular damage, shows potential for predicting adverse outcomes in SAH patients. Elevated LDH levels may reflect anaerobic metabolism and tissue injury following SAH, providing insight into disease severity and complications. This review explores the relationship between lactate dehydrogenase levels and outcomes in SAH patients.

Methods: A systematic review was conducted using PubMed, Europe PMC, ScienceDirect, and Google Scholar, searching for terms like "Lactate Dehydrogenase," "LDH," "Subarachnoid Hemorrhage," and "Outcome" up to March 3, 2025. Studies comparing LDH levels with Modified Rankin Score (mRS) and secondary outcomes such as Hunt-Hess grade, Fisher grade, complications, and mortality were included.

Results: Seven studies involving 5,985 participants met inclusion criteria. Higher LDH levels correlated with worse mRS scores, increased delayed cerebral ischemia (DCI), postoperative pneumonia, severe Hunt-Hess and Fisher grades, and higher mortality. Using the ROBINS-I tool, four studies showed low risk of bias, and three had moderate risk.

Discussion: Elevated LDH levels predict adverse outcomes in SAH, highlighting its prognostic value. As a marker of cellular damage and anaerobic metabolism, LDH reflects tissue injury and hypoxia post-SAH, explaining its link to complications like delayed cerebral ischemia (DCI) and pneumonia. This physiological basis supports its role in risk stratification, aiding early identification of high-risk patients for targeted interventions and improved outcomes.

Conclusion: Early measurement of LDH levels after SAH onset may help predict patient outcomes and complications, aiding clinical decision-making and improving patient management strategies.

Keywords: Lactate Dehydrogenase, Subarachnoid Hemmorhage, Prognosis, Outcome

ID_140 Case Report/GP

Successful treatment of Anti-SRP Immune-Mediated Necrotizing Myositis: A Rare Case Report

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Background: Anti-SRP Immune-Mediated Necrotizing Myositis (SRP IMNM) is a rare autoimmune disease that causes muscle damage. Treating the patient is also a challenge.

Case Summary: A 52-year-old woman presented with symmetrical thigh weakness causing hard to get up from chair, then slowly progress into both hand hard to raise hand. Also having muscle pain, difficulty swallowing. History of Covid 19 infection 2 weeks prior was reported, but now negative tested for Covid, hypertension and diabetes were denied. On examination, her vital signs were within normal limits. Neurological assessment revealed symmetrical upper and lower limb motor strength graded 2/2, along with decreased physiological reflexes in the hands and feet. Laboratory tests showed Kalium 3.1mmol/L, SGOT 413.6U/L, SGPT444.7U/L, Creatinine Kinase 4085U/L positive anti-SRP antibodies, and electromyography (EMG) indicated a generalized irritable myopathy. Initial treatment with methylprednisolone monotherapy, followed by intravenous immunoglobulin (IVIG), but failed to improve muscle weakness, weakness not also corrected with hypokalemia improvement. However, after initiating immunotherapy with Rituximab, the patient showed a significant improvement in muscle strength. With serial Rituximab administration, her symptoms improved remarkably, allowing for the gradual tapering of oral methylprednisolone.

Discussion: Glucocorticoids, either alone or in combination with IVIG, are typically effective in treating autoimmune myositis. However, in this case, the patient did not respond to initial therapy. Once the diagnosis of SRP IMNM was confirmed, treatment with immunotherapy led to rapid clinical improvement.

Conclusion: Therapy of anti SNRP involving rituximab may have a good outcome, and follow-up after treatment is very important to prevent refractory IMNM.

Keywords: Anti-SRP IMNM, IVIG, immunotherapy, Case Report

ID_141 Research Article/GP

Effect of Intradetrusor Botulinum Toxin A on Post-Void Residual in Parkinson's Disease: A Meta-Analysis

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Background: Overactive bladder (OAB) is common in Parkinson's disease (PD) and adversely impacts quality of life. Intradetrusor botulinum toxin A (BoNT-A) is used to manage OAB. However, concerns have been raised regarding the potential for increased post-void residual (PVR). This meta-analysis aims to clarify the effect of BoNT-A on PVR in PD.

Methods: A PRISMA-guided systematic search of the literature was conducted. Five studies that reported pre- and post-injection PVR values in PD patients were included. Data on study design, patient demographics, treatment protocol, and PVR were systematically extracted. Meta-analysis with a random-effects model was performed.

Results: The overall estimate was a mean difference of −63.79 mL (95% CI: −99.36 to −28.22, p = 0.0004), indicating that there was a significant increase in PVR following treatment. Heterogeneity was moderate with Tau^2 = 937.72, Chi^2 = 12.09 (df = 4, p = 0.02), and I^2 = 67%. The forest plot consistently demonstrated BoNT-A injections to be associated with higher PVR across the studies.

Discussion: The forest plot concurs with a robust overall effect of BoNT-A on PVR increase. Moderate heterogeneity suggests that dosing, injection techniques, and patient selection can influence results. These findings highlight the necessity to weigh OAB symptom relief against urinary retention risk.

Conclusion: Intradetrusor injections of BoNT-A in PD patients lead to a sudden increase in PVR. Post-treatment observation and careful patient selection are essential. In the future, treatment protocols need to be standardized for better outcomes.

Keywords: Parkinson's Disease; Overactive Bladder; Botulinum Toxin A; Post-Void Residual

ID_142 Research Article/GP

Efficacy of Neuroprotective Agents in Alzheimer's Disease: A Causal Deep Learning Meta-Analysis with Neural Architecture

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Background: Neuroprotective agents are one of the medications given in Alzheimer's Disease (AD). This study will use Causal Deep Learning Meta-Analysis with Neural Architecture Search (NAS) to evaluate the efficacy of those neuroprotective agents such as Sodium Butyrate, Clavulanic Acid, and Montelukast.

Methods: This study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline for a network meta-analysis and includes randomized controlled trials and observational studies. Treatment effects were quantified using Bayesian causal inference, Instrumental Variable (IV) Analysis, Counterfactual Outcome Prediction, and Neural Architecture Search (NAS) and were evaluated using area under the curve (AUC), root mean square error (RMSE), and mean absolute error (MAE).

Results: The NAS-selected model performed better than conventional meta-analysis (AUC = 0.94, +18.2%; RMSE = 1.12, -25.4%). Instrumental Variable (IV) Analysis revealed hazard ratio (HR) of 0.62, 95% confidence interval (CI) of 0.51–0.75, whereas average treatment effect (ATE) enhanced Mini-Mental State Examination (MMSE) by 3.27 points ($p < 0.001$). Sodium Butyrate, Clavulanic Acid, and Montelukast decelerated cognitive decline (MMSE +2.98, $p < 0.001$) and decreased Alzheimer's disease (AD) progression risk (HR = 0.59, 95% CI: 0.46–0.72). Leave-one-out cross-validation (LOO-CV) Score of -134.2 guarantees model robustness.

Discussion: Causal inference yields robust and consistent findings, and NAS prioritizes decision-making regarding treatments and maximizes therapeutic specificity in AD.

Conclusion: Sodium Butyrate, Clavulanic Acid, and Montelukast are effective neuroprotective agents in AD.

Keywords: Alzheimer's Disease, Neuroprotective Agents, Causal Deep Learning, Meta-Analysis, Neural Architecture Search

ID_143 Research Article/GP

Which Tau Biomarker Tells the Truth? A Network Meta-Analysis of Blood & CSF in Alzheimer's Disease

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Background: Alzheimer's disease (AD) is marked by amyloid-β (Aβ) plaques and tau neurofibrillary tangles. While Aβ is a hallmark of AD, tau biomarkers correlate more strongly with cognitive decline. Unlike Aβ, total tau (t-tau) & phosphorylated tau (p-tau) better reflect neurodegeneration. However, no comprehensive network meta-analysis has assessed their diagnostic performance.

Methods: A network meta-analysis was conducted per PRISMA guidelines. Studies comparing tau biomarkers' diagnostic accuracy were identified through database searches. Inclusion criteria included studies reporting sensitivity, specificity, or other diagnostic metrics for cerebrospinal fluid (CSF) and plasma tau. Data extraction and quality assessment were performed independently. Statistical analyses used a random-effects model, and publication bias was evaluated via QUADAS 2.0.

Results: Plasma and CSF had equal SUCRA scores (50%), indicating similar diagnostic effectiveness. Plasma showed higher sensitivity (87.73%) than CSF (83.88%), making it superior in detecting AD. CSF had higher specificity (87.56%) than plasma (85.85%), reducing false positives. The SROC curve showed a slightly higher AUC for plasma, suggesting a minor diagnostic advantage.

Discussion: Plasma and CSF perform similarly, but each has strengths—Plasma is more sensitive due to biomarker stability in blood, while CSF is more specific, reflecting brain pathology. Equivalent SUCRA scores suggest no absolute superiority, supporting a combined biomarker approach. This study confirms p-tau 217 and p-tau 231 as key biomarkers. AI-based diagnostics may enhance future interpretations.

Conclusion: Plasma and CSF biomarkers effectively diagnose AD, with plasma excelling in sensitivity and CSF in specificity. Combining both may improve diagnostic accuracy, aiding early detection and management of AD.

Keywords: Alzheimer's disease, tau, cerebrospinal fluid, blood, diagnostic accuracy

ID_144 Research Article/Neurologist

The Association between Glial Fibrillary Acidic protein, Phosphorylated Neurofilament Heavy Chain, and Neuron Specific Enolase Serum Levels with Traumatic Brain Injury Outcome

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Background: Traumatic brain injury (TBI) is a major health problem globally. Advanced studies still have differences in outcome that are not always explained. Recent studies focused on the use of biomarkers to predict outcome of TBI patients. Research on TBI involving a combination of several biomarkers is still very limited. We use three biomarkers namely Glial Fibrillary Acidic Protein (GFAP) as glial marker, phosphorylated Neurofilament Heavy Chain (pNFH) as axonal marker, and Neuron Specific Enolase (NSE) as neuronal marker.

Methods: A total of ninety-nine TBI patients were taken for blood sampling by using the ELISA method and obtained serum levels of GFAP, NSE, and pNFH. The patient's outcome was assessed using the Glasgow Outcome Scale (GOS). Data were analyzed by conducting diagnostic tests and bivariate analysis of the association between biomarkers and TBI outcomes.

Results: Eighty nine (89) patients had good outcomes and only 10 patients had poor outcomes. The results of serum examinations were grouped based on the cut-off point values associated with TBI outcomes. Serum levels of GFAP, NSE, and pNFH in the blood of TBI patients did not have a significant association with the patient outcomes ($p<0,05$).

Discussion: Many studies have been conducted on biomarkers for TBI but several previous studies are still pros and cons regarding the association between biomarker levels and TBI outcomes that it still need further studies in the future.

Conclusion: In this study, the results showed that the biomarkers GFAP, NSE, and pNFH did not have a significant association with TBI outcomes.

Keywords: Traumatic brain injury, Biomarkers, Outcome

ID_145 Research Article/Medical Student

Meta-Analysis of Artificial Intelligence for High Frequency Oscillation Detection Based on EEG: Assessing Diagnostic Performance and Accuracy

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Background: High-frequency oscillations (HFOs) in electroencephalograms (EEGs) are an important biomarker for epilepsy. Currently, the gold standard for HFO detection is the visual analysis performed by experts. However, this process is expert-biased and time-consuming. Developing fast, accurate, and robust detection methods for HFOs based on EEG may facilitate seizure onset zone detection. We aim to assess the performance of deep learning (DL) and classic machine learning (ML) algorithms in classifying EEG segments into HFO and non-HFO categories in each electrode.

Methods: This study uses a diagnostic accuracy meta-analysis method. Included studies from PubMed, IEEE, and Scopus were analyzed with MetaDisc for bivariate assessment and heterogeneity, with confusion metrics obtained directly or indirectly.

Results: Out of the 17 studies we analyzed, the combined sensitivity result was 51.0% (95% CI: 50.7-51.3), specificity was 49.8% (95% CI: 49.5-50.0), the area under the curve (AUC) was 0.85.

Discussion: This review highlights the variety of AI models available for HFO detection in EEG. Unlike research with artifact removal, this review includes studies that have not addressed artifact removal, which may contribute to the observed poorer performance.

Conclusion: This study demonstrates the efficacy of AI in detecting HFOs, with the AUC indicating good performance. However, further development is needed for AI in HFO detection to address existing challenges and improve accuracy.

Keywords: Machine learning, deep learning, eeg, High-frequency oscillations

ID_146 Research Article/Medical Student

Bioinformatics Analysis Unveils Molecular Mechanisms in Ruptured Intracranial Aneurysm Patients

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Background: Intracranial aneurysms (IA) are defined as dilations that occur at weak points along the arterial circulation of the brain, with rupture leading to subarachnoid hemorrhage (SAH) and associated with high mortality and morbidity. Increasing evidence suggests dysregulated gene expression and epigenetics play a crucial role in the pathogenesis of ruptured IA. This study aims to identify differentially expressed genes (DEGs) and regulatory pathways involved in ruptured IA using integrated bioinformatics approaches.

Methods: Differential expression analysis of the GSE54083 dataset was performed using GEO2R, identifying DEGs with $|logFC| > 3$ and adjusted p-value < 0.05, followed with Gene Ontology (GO) and KEGG pathway enrichment analyses. PPI network analysis was performed with hub genes ranked by degree centrality.

Results and Discussion: A total of 220 DEGs were identified (106 upregulated, 114 downregulated). GO analysis showed upregulated DEGs were enriched in cardiac muscle contraction, focal adhesion, and myosin binding, while downregulated DEGs were linked to lipid metabolism, inflammation, and oxidoreductase activity. KEGG analysis revealed adherens junction, PI3K-Akt signaling, and atherosclerosis for upregulated DEGs, while downregulated DEGs were associated with PPAR, TNF, AMPK signaling, and cortisol synthesis. PPI analysis identified HSP90AA1, YWHAZ, GSK3B, MAPK14, and MAP1LC3B as top hub genes upregulated, suggesting their potential as therapeutic targets.

Conclusion: This study identifies key DEGs, pathways, and hub genes associated with ruptured IA, highlighting the roles of vascular remodeling, inflammation, lipid metabolism, and cell signaling in its pathogenesis. Identified hub genes may serve as potential biomarkers or therapeutic targets, warranting further investigation for early diagnosis and treatment strategies.

Keywords: Ruptured intracranial aneurysm, differentially expressed genes, pathway enrichment, biomarkers

ID_147 Case Report/GP

Oculogyric Crisis Induced by Metoclopramide: A Case Report on Recognition and Rapid Management

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Background: Oculogyric crisis (OGC) is an acute dystonic reaction characterized by involuntary, sustained upward eye deviation, often triggered by dopamine D2 receptor antagonists like metoclopramide. It is frequently misdiagnosed as a seizure or psychiatric disorder, leading to unnecessary investigations and treatment delays. If untreated, OGC can cause significant distress, severe discomfort, and, in extreme cases, airway compromise due to dystonic involvement of respiratory muscles.

Case Summary: A 29-year-old male presented with a three-hour history of persistent upward eye deviation and neck stiffness. He was alert but visibly anxious. Neurological examination revealed sustained upward gaze with restricted downward movement, intact pupillary reflexes, and no nystagmus. Mild retrocollis was present with increased muscle tone. The absence of loss of consciousness, automatisms, or postictal confusion ruled out seizure activity. Further history-taking revealed recent metoclopramide use for gastrointestinal symptoms. A diagnosis of metoclopramide-induced OGC was made. The patient was treated with intravenous diphenhydramine, leading to rapid symptom resolution. After two hours of observation, he was discharged with oral diphenhydramine and advised to discontinue metoclopramide.

Discussion: OGC is a drug-induced movement disorder caused by dopamine blockade in the basal ganglia. Delayed recognition and treatment can prolong symptoms and, in severe cases, lead to airway compromise. First-line treatment involves discontinuing the causative agent and administering anticholinergic therapy such as diphenhydramine or benztropine.

Conclusion: Early recognition prevents misdiagnosis, unnecessary investigations, and prolonged hospital stays. Prompt discontinuation of the offending drug and administration of diphenhydramine ensures rapid symptom resolution, improving patient outcomes.

Keywords: Oculogyric crisis, acute dystonia,drug-induced movement disorder

ID_148 Research Article/GP

Normal Values of Indonesian Masseter Inhibitory Reflex

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Background: The Masseter Inhibitory Reflex (MIR) is a neurophysiological test used to evaluate brainstem reflex pathways through trigeminal nerve function. It has been used to diagnosed trigeminal neuralgia, tension-type headache, multiple sclerosis, stroke, and Parkinson's disease. There is no established normal reference for MIR in Indonesia, therefore the study aims to obtain normative values specific to the Indonesian population.

Methods: This study involved 42 healthy adult subjects undergoing history taking, physical examination, and MIR examination. It was conducted using a method by Türker and Miles (1985) and Arendt-Nielsen et al. (1994). The data were analyzed using SPSS 26.0 software to compare differences between groups.

Results: Most of the subjects were female (57.1%), normoweight, and the median age of subjects is 32 years (21-55). Subjects exhibited different MIR responses, 5 subjects exhibiting a unilateral response (11.9%), 35 subjects with a bilateral response (83.3%), and 2 subjects with no response (4.8%). This study obtained 75 values of MIR latency, consisting of 38 values of R1 latency and 37 values of R2 latency. Values of MIR latency were R1= 11.60 ± 3.88 ms and R2 = 51.56 ±13.08 ms.

Discussion: A subset of healthy individuals may have unilateral or no responses of MIR, potentially due to differences of clenching level, activation of different receptor sites, inadequate stimulation intensity or strength, insufficient muscle contraction during testing, and habituation.

Conclusion: The normal latency values obtained from this study could serve as a reference for MIR examination in Indonesia (R1= 11.60 ± 3.88 ms and R2 = 51.56 ±13.08 ms).

Keywords: Masseter Inhibitory Reflex (MIR); Indonesia; Trigeminal

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Fractional Anisotrophy and Mean Diffusivity of Brain MRI profile of post stroke Aphasia patients

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Background: Aphasia is a debilitating consequence of stroke that significantly impacts communication and quality of life. Understanding the clinical and neuroimaging characteristics of stroke-related aphasia can aid in refining rehabilitation strategies. Objective: This study aimed to characterize the neuroimaging and clinical profiles of stroke patients with aphasia treated at RSCM.

Methods: A cross-sectional analysis was conducted on 28 stroke patients with aphasia. Neuroimaging assessments included fractional anisotropy (FA) and mean diffusivity (MD) values for key language-associated tracts (e.g., arcuate fasciculus, frontal aslant tract). Statistical analyses included chi-square tests, ANOVA, logistic regression, and correlation analyses.

Results: Global aphasia was the most prevalent subtype (52.6%), followed by sensory (23.7%) and transcortical motor aphasia (13.2%). The median time from stroke onset to evaluation was 6 months (IQR: 2–24). Hemiparesis (84.2%) and cranial nerve deficits (55.3%) were common comorbidities. Neuroimaging findings revealed that reduced FA in the left arcuate fasciculus correlated with global aphasia (p=0.03), while sensory aphasia was associated with elevated MD in the superior longitudinal fasciculus (p=0.01).

Conclusion: The findings highlight the interplay between vascular risk factors, white matter tract-specific disruptions, and aphasia phenotypes. Early neuroimaging biomarkers may improve aphasia classification and rehabilitation planning.

Keywords: Aphasia, stroke, hypertension, neurological deficits, rehabilitation, neuroimaging