JAKARTA NEUROLOGY EXHIBITION, WORKSHOP, AND SYMPOSIUM

Brain, Breakthroughs & Beyond

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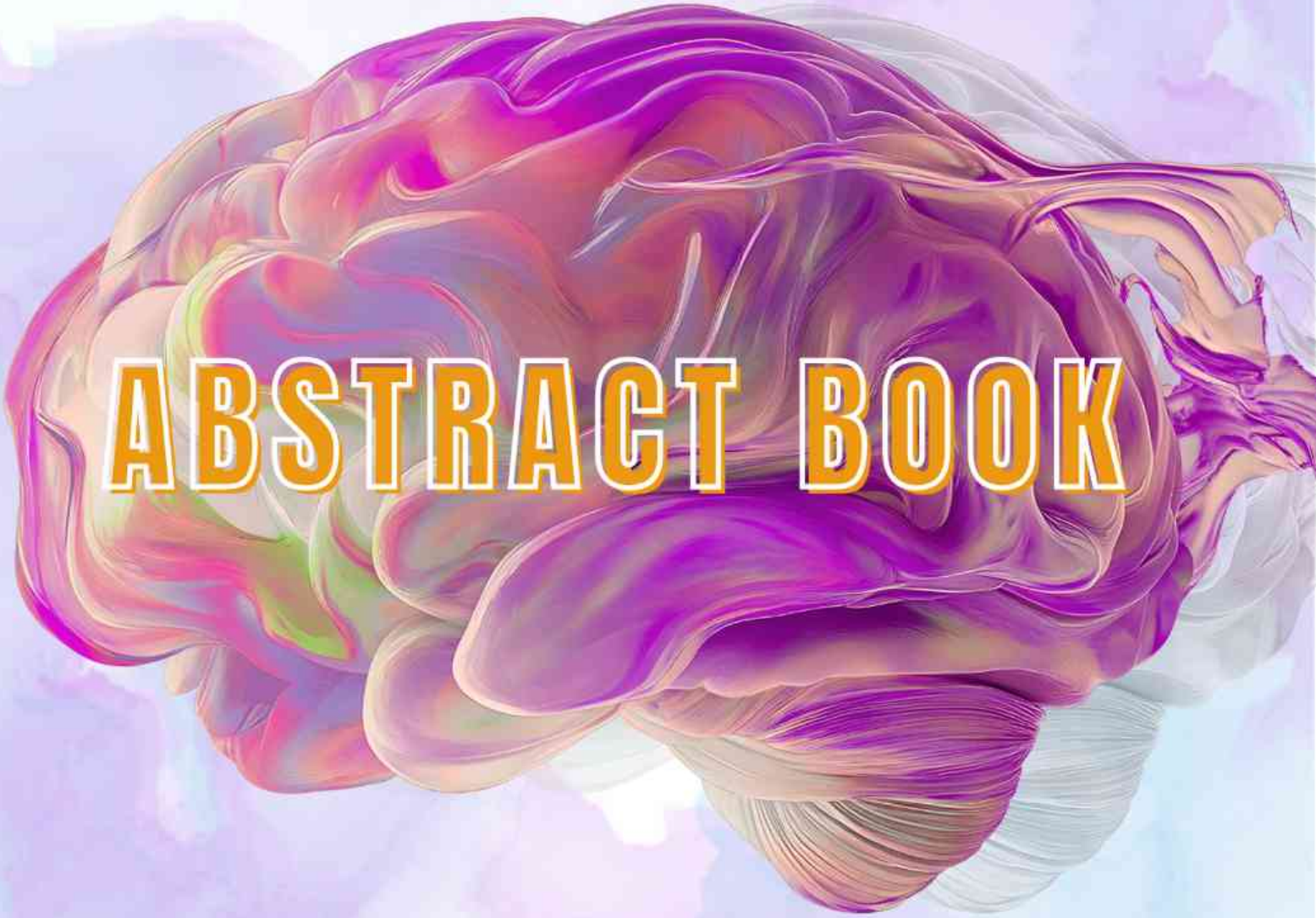

ABSTRACT BOOK

DEPARTMENT OF NEUROLOGY, FACULTY OF MEDICINE, UNIVERSITAS INDONESIA

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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 13th Jakarta Neurology Exhibition, Workshop and Symposium (JakNEWS), themed Brain Breakthrough and Beyond. This prestigious event was organized by the Department of Neurology FKUI in collaboration with PERDOSSI JAYA in May 2026.

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,

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Chairman of Organizing Committee

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ID_3 Research / Neuro-Infection

Safety and Clinical Outcomes of Intravenous-to-Oral Antibiotic Switch Therapy in Patients with Brain Abscess: A Systematic Review

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Abstract

Background
Brain abscess requires prolonged intravenous (IV) antibiotics, but early transition-to-oral-switch (IVOS) therapy may reduce hospital stay and healthcare burden. Evidence on safety, efficacy, and timing remains limited.

Method
A systematic search of PubMed, Cochrane Central, ScienceDirect, and Taylor & Francis identified 67 studies; four met inclusion criteria, including 542 patients. Data on demographics, IV and oral antibiotic regimens, therapy duration, clinical outcomes, and adverse events were extracted.

Results
Patients were predominantly male (63–83.5%). IV antibiotics included -lactams, metronidazole, thiophenicol, aminoglycosides, and penicillin derivatives, lasting 5–28 days. Oral regimens included fluoroquinolones, amoxicillin, rifampicin, clindamycin, cotrimoxazole, and nitroimidazoles. Total antibiotic duration ranged 36–140 days. IVOS was performed early (≤10 days) in 57% of patients in one study and after stabilization in others. Favorable outcomes (GOS 4–5) occurred in 61–82%. Mortality ranged 12–18.1%, mainly in severe cases. No abscess recurrence was reported at six months. Adverse events, mostly mild cytopenias, occurred in 25–76%; few required therapy modification. Early IVOS was associated with shorter hospitalization and fewer surgical revisions but was not an independent predictor of outcome.

Discussion
IVOS can be safely implemented in selected patients with brain abscess, potentially reducing hospital stay and healthcare costs. However, heterogeneity in timing and patient selection highlights the need for standardized protocol. GCS at admission and comorbidities remain the most important prognostic factors.

Conclusion
IVOS appears safe and effective, with potential additional benefits from early switch.. Further research is needed to determine optimal timing and patient selection.

Keywords: Antibiotics, brain abscess, intravenous-to-oral switch, systematic review, treatment outcomes

ID_4 Research / Neuro-Behavior

Prognostic Value of Sleep Spindle Power on Cognitive Decline in Alzheimer's Disease: A Systematic Review

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Abstract

Background
Disruptions in sleep physiology are known to precede cognitive decline in Alzheimer's disease (AD) and are associated with impairments in memory consolidation. However, the specific sleep characteristics that predict neurodegenerative changes in AD remain unclear. This systematic review summarizes current evidence on sleep microstructure changes in AD and their relationship to cognitive outcomes.

Method
A systematic search of PubMed, Cochrane, and the National Library of Medicine (NLM) following PRISMA guidelines, identifying cohort studies conducting standard overnight polysomnography with 10-20 systems EEG according to the International system, with sleep stages according to standard AASM criteria, while assessing longitudinal cognitive function. Study quality was assessed using QUIPS tool.

Results
A total of 3 studies were included. Despite differences in the specific oscillatory metrics assessed, all studies demonstrated a consistent direction of effect of how reduced sleep spindle power was associated with worse cognitive outcomes. Two studies directly examined temporal lobe spindle power, while one study evaluated slow oscillation–coupled theta burst power, a related but distinct marker of sleep oscillatory coordination.

Discussion
Higher sleep spindle–related oscillatory power showed protective direction of association with cognitive outcomes, despite heterogeneity in spindle metrics and cognitive assessments. These findings are limited by small sample sizes, variability in outcome definitions, and moderate risk of bias, highlighting the need for larger, harmonized longitudinal studies.

Conclusion
Higher sleep spindle power was associated with slower cognitive decline in Alzheimer's disease. Thus sleep spindle–related oscillatory activity is a potential target for future sleep-based interventions.

Keywords: Alzheimer's disease, Polysomnography, Sleep spindle activity, Cognitive function

ID_5 Case Report / Neuro-Vascular

When the Heart Fails the Brain: Subacute-to-Chronic Cardioembolic Cerebral Infarctions After STEMI Presenting With Altered Consciousness

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Abstract

Background

Acute ischemic stroke is a recognized but often underdiagnosed complication following ST-elevation myocardial infarction (STEMI). Cardioembolic mechanisms, systemic inflammation, and metabolic derangements may contribute to cerebral ischemia, particularly in patients with multiple comorbidities. Neurological manifestations in post-STEMI patients may be subtle or delayed, leading to diagnostic challenges in critical care settings

Case Summary

We report a 48-year-old man with uncontrolled type 2 diabetes mellitus admitted for acute anterior STEMI complicated by heart failure and pulmonary infection. During hospitalization, he developed progressive neurological decline with altered consciousness, impaired communication, and visual disturbances without focal motor deficits. Brain CT showed multifocal subacute-to-chronic thromboembolic infarctions in the right parietotemporal cortex and subcortex, lacunar infarctions in the left basal ganglia and bilateral thalami, and an encephalomalacic cyst in the left parieto-occipital region. Chest radiography revealed bilateral infiltrates suggestive of pneumonia or cardiogenic pulmonary edema. Laboratory findings demonstrated persistent hyperglycemia and elevated cardiac biomarkers, consistent with multifocal cardioembolic cerebral infarctions following STEMI.

Discussion

This case illustrates the complex interplay between acute coronary syndrome and cerebrovascular complications, reflecting disruption of the heart–brain axis. Uncontrolled diabetes and systemic infection likely increased thromboembolic risk and delayed neurological recognition. Multiterritorial and multistage infarctions support an embolic rather than small-vessel mechanism. Early neuroimaging and multidisciplinary collaboration are essential in high-risk post-STEMI patients.

Conclusion

Multifocal cerebral infarctions may complicate STEMI and present with atypical or delayed neurological symptoms. Heightened neurological vigilance, timely neuroimaging, and integrated multidisciplinary management are essential to prevent delayed diagnosis and optimize clinical outcomes in patients with acute myocardial infarction

Keywords: ST-elevation myocardial infarction; Cardioembolic stroke; Multifocal cerebral infarction; Diabetes mellitus; Heart–brain axis.

ID_6 Case Report / Neuro-Restoration

Repetitive Transcranial Magnetic Stimulation in Patients with Post-Stroke Homonymous Visual Field Defects: A Case Series

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Abstract

Background

In Indonesia, stroke remains a leading cause of long-term neurological disability, and visual impairment after is frequently reported. Current management of post-stroke homonymous visual field defects still has limited options for direct restoration of visual fields. Repetitive transcranial magnetic stimulation (rTMS) has emerged as a potential neuromodulatory intervention aimed at promoting cortical plasticity and functional recovery.

Case Summary

This case series describes four patients (three males, one female; age range 31–57 years) with post-stroke visual field defects treated with rTMS at Abdi Waluyo Hospital between 2024 and 2025. Lesions involved the occipital, parieto-occipital, or optic radiation regions –two patients experienced homonymous hemianopia while the other two experienced superior homonymous quadrantanopia. Two patients received adjunctive neuroprotective agents, and two underwent combined electrical muscle stimulation (EMS). Stimulation protocols predominantly targeted bilateral posterior parietal regions (P3/P4) using combined low-frequency (1 Hz, 1000 pulses) and high-frequency (10 Hz, 1600–2000 pulses) paradigms at 80–90% motor threshold, with one case incorporating occipital (O1) 20 Hz or cTBS. Treatment frequency ranged from 3–5 sessions per week initially, tapering over 10–29 weeks (20–39 sessions total). Patients demonstrated varied, up to 23%, improvement in Humphrey Visual Field indices compared to baseline.

Discussion

Clinical improvement suggests that rTMS may enhance neuroplastic reorganization of visual networks. Greater gains were associated with intensive early-phase stimulation and bilateral parietal modulation strategies.

Conclusion

rTMS may represent a promising adjunctive therapy for post-stroke visual field defects. Larger controlled studies are required to establish standardized protocols and confirm long-term efficacy.

Keywords: visual field defects, stroke, repetitive transcranial magnetic stimulation

ID_8 Case Report / Neuro-Infection

Suspected Zoonotic Bacterial Meningoencephalitis Associated With Raw Pork Blood Consumption Complicated by Fatal Neuroleptic Malignant Syndrome: Clinical and Neuroanatomical Insights

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Abstract

Background
Meningoencephalitis is a life-threatening inflammatory condition involving the brain parenchyma and meninges. In Bali, zoonotic bacterial meningitis has been epidemiologically linked to consumption of raw pork products such as lawar merah, with Streptococcus suis recognized as a regional pathogen. We report a suspected zoonotic meningoencephalitis complicated by fatal Neuroleptic Malignant Syndrome (NMS), emphasizing clinical reasoning and neuroanatomical considerations.

Case Summary
48-year-old male presented with acute decreased consciousness (Glasgow Coma Scale E1V2M1) following two days of high fever and severe headache. He reported consuming raw pork blood 2–3 weeks prior. Laboratory findings revealed marked leukocytosis (25,690/L) and hyperglycemia. Contrast-enhanced head computed tomography showed no basal meningeal enhancement. Despite the absence of cerebrospinal fluid analysis, clinical presentation and systemic inflammatory response strongly suggested acute bacterial meningoencephalitis. Intravenous ceftriaxone and dexamethasone were initiated. Severe agitation was treated with haloperidol. Subsequently, the patient developed generalized "lead-pipe" rigidity, hyperthermia (39.9°C), and autonomic instability consistent with NMS, progressing to cardiac arrest on hospital day four.

Discussion
Zoonotic pathogens such as S. suis may breach the blood–brain barrier through paracellular disruption of tight junctions. Normal early computed tomography does not exclude central nervous system infection. Acute inflammatory involvement of basal ganglia pathways may increase vulnerability to dopamine receptor antagonism, lowering the threshold for NMS.

Conclusion
Recognition of cultural exposure risks and cautious use of dopamine antagonists in suspected central nervous system infections are essential to prevent fatal complications.

Keywords: Zoonotic Meningoencephalitis, Streptococcus suis, Raw Pork Consumption, Neuroleptic Malignant Syndrome, Bali

ID_9 Case Report / Neuro-Oncology

Unusual Diagnostic Trap: Epigastric Pain Masks Neurological Emergency in Suspected Glioblastoma

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Abstract

Background
Glioblastoma Multiform (GBM) is an aggressive brain tumour in adults, presenting with rapid progression, infiltrative growth, and poor prognosis, with an incidence of less than 10 per 10,000 people. Typical manifestations include headache, seizure, and cognitive deficit; however, atypical manifestations such as gastrointestinal or bladder control (43%), dyspnea (20%), and dysphagia (30%) may delay neuroimaging, and progression of this disease leads to increased intracranial pressure or vasogenic edema.

Case Summary
A 49-year-old woman presented with epigastric pain, nausea, vomiting, and dizziness without neurological deficits. The initial diagnosis was a gastrointestinal pathology. Laboratory findings showed no abnormality, ruling out the diagnosis of metabolic encephalopathy. Two days later, she developed decreased consciousness with snoring respiration and abnormal flexion response. Non-contrast CT revealed a large right hemispheric lesion (54 x 73 mm) with a central hypodense lesion, and a 7.5 mm midline shift, highly suggestive of GBM with a space-occupying lesion. Neuro-emergency management, including oxygen supplementation, dexamethasone, a nasogastric tube, a urinary catheterization, and intensive observation, followed by neurosurgical referral.

Discussion
Gastrointestinal symptoms resulted from intracranial pressure, area postrema stimulation, or biochemical abnormalities. Significant midline shift (>5 mm) associated with neurological deterioration and impending cerebral herniation

Conclusion
Careful anamnesis, neurological examination, and neuroimaging are essential to differentiate gastrointestinal from intracranial causes and prevent delayed diagnosis.

Keywords: glioblastoma multiform, delayed diagnosis, altered consciousness

ID_10 Research / Other

Chronic Rhinosinusitis as a Potential Predictor of Obstructive Sleep Apnea Development : A Mini Systematic Review

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Abstract

Background

Obstructive Sleep Apnea (OSA) is known as a common sleep disorder and major public health issue that affecting approximately 936 million people worldwide. The global prevalence rose by 12% from previous decade, especially in the Asia and Latin America. OSA also known as chronic respiratory condition characterized by complete or partial obstruction of upper airway during sleep, which related to Chronic Rhinosinusitis (CRS). Emerging evidence showed that CRS maybe an unrecognized risk factor of OSA, in spite of unclear correlation. In this review, we aim to elucidate the potential of CRS to be a clinical predictor of OSA.

Method

We conducted structured search for cohort study with Gooogle Scholar, PUBMED, ScienceDirect, and Proquest search engine, between February 2016 and February 2026. All examiners independently screened and tested the eligibility of the studies.

Results

Three cohort studies comprising of 9,509 subjects met the requirements for analysis. All studies showed that OSA appeared after subjects was diagnosed with CRS, where the CRS diagnosis was confirmed, at least after 8 weeks to 3 months. Odds Ratio (OR) was ranged from 1.80-1.98.

Discussion

Two from three studies showed a significant relationship between CRS and OSA development. Differences between the results may be due to differences in location, total subject, and diagnostic duration of CRS.

Conclusion

CRS can become potential clinical predictor for OSA development. Further research is still needed in this area to establish it in clinical use.

Keywords: Chronic Rhinosinusitis, Obstructive Sleep Apnea, Morbidity

ID_11 Case Report / Movement Disorder

Ischemic Stroke in Disguise: an Abnormal Movement Ischemic Stroke Case Report

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Abstract

Background
This case report aims to heighten awareness that acute, sudden-onset abnormal movements can signal an underrecognized ischemic stroke, even without classic BEFAST (Balance, Eyes, Face, Arms, Speech) symptoms. Swift stroke diagnosis is vital, as time critically influences prognosis; yet, the typical presentation of hemiparesis often overshadows atypical features such as movement disorders, risking misdiagnosis.

Case Summary
A 60-year-old woman presented to the emergency department with sudden abnormal jaw and left limb movements lasting one day, with no prior episodes or accompanying symptoms. Comprehensive physical exams, ancillary tests, and imaging revealed an ischemic stroke in the left corona radiata on MRI (Magnetic Resonance Imaging).

Discussion
These hyperkinetic movements stemmed from stroke infarction at corticostriatal fibers region, which normally transmit excitatory glutamatergic signals from the cortex to basal ganglia structures like the caudate nucleus and putamen.(1,2) This input inhibits the globus pallidus internus, disinhibiting the thalamus to enable smooth movement initiation. Lesions in this pathway, as seen here, provoke abnormal hyperkinetic disorders. (3)

Conclusion
Left corona radiata ischemia atypically manifested as isolated movement abnormalities due to corticostriatal pathway interruption. Clinicians must vigilantly consider ischemic stroke in patients with abrupt-onset movement disorders, regardless of absent traditional symptoms, to ensure timely intervention and better outcomes.

Keywords: abnormal movement, stroke, ischemic stroke

ID_12 Research / Neuro-Immunology

Efficacy and Safety of Bruton's Tyrosine Kinase Inhibitor for Multiple Sclerosis: A Systematic Review of Randomized Controlled Trials

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Abstract

Background

Current disease-modifying therapies for multiple sclerosis (MS) reduce peripheral-immune activity but may inadequately address compartmentalized CNS inflammation. This systematic review evaluates efficacy and safety of Bruton's tyrosine kinase inhibitors (BTKIs) that modulate both B-cell signaling and microglial activation in CNS.

Method

MEDLINE, ScienceDirect, EuropePMC, and CENTRAL were searched following PRISMA guidelines for randomized controlled trials (RCTs) evaluating BTKIs' effectiveness and safety profiles. Methodological quality was assessed with the Jadad Scale and ROB-2.

Results

Eight good-quality RCTs (n=5796) were included. Compared with teriflunomide, tolebrutinib and evobrutinib showed similar annual relapse rates (ARR), although tolebrutinib reduced confirmed disability progression (CDP) versus teriflunomide or placebo. Evobrutinib lowered ARR versus placebo but not sustained CDP ≥6 months. Fenebrutinib also lowered ARR versus placebo. MRI-related outcomes were inconsistent: two RCTs reported more new/enlarging T1W/T2W lesions with tolebrutinib versus teriflunomide, whereas others reported fewer lesions with tolebrutinib and fenebrutinib versus placebo. Adverse events were more common than placebo but comparable to teriflunomide. Serious events were comparable between tolebrutinib and teriflunomide, higher with evobrutinib, and unreported with fenebrutinib. Reversible ALT elevation was comparable to teriflunomide. No treatment-related deaths occurred.

Discussion

Variations in efficacy among BTKIs may reflect differences in blood-brain barrier penetration, influencing their effects on CNS inflammation and disease progression, as seen through MRI lesions formation. Different control arms across RCTs limit direct comparisons and may explain the absence of consistent superiority.

Conclusion

BTKIs demonstrate promising efficacy in MS, but no consistent superiority over currently approved therapies. There is still concern regarding their safety, especially hepatotoxicity.

Keywords: Bruton tyrosine kinase inhibitor, multiple sclerosis, safety, efficacy, randomized controlled trials

ID_13 Case Report / Neuro-Vascular

When Vertigo Is Not Benign: Basilar Tip Aneurysm Mimicking Acute Vestibular Syndrome

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Abstract

Background
Acute vestibular syndrome (AVS) is most commonly caused by benign peripheral vestibular disorders. However, an important subset arises from central etiologies that may be difficult to recognize at initial presentation. Basilar tip aneurysms are rare intracranial vascular lesions that typically present with subarachnoid hemorrhage or cranial nerve deficits and only infrequently manifest as isolated vertigo. Such presentations may closely mimic peripheral vestibulopathy and potentially lead to diagnostic delay.

Case Summary
A 56 year old woman presented with sudden-onset persistent spinning vertigo that began while bathing and worsened with positional changes, accompanied by nausea and recurrent vomiting. She denied focal neurological deficits. Neurological examination was unremarkable except for bidirectional horizontal nystagmus. Non-contrast head CT revealed suspected intracranial aneurysmal dilatations. Digital subtraction angiography demonstrated an incidental saccular basilar tip aneurysm. The PHASES score was 11, corresponding to an estimated 5 year rupture risk of 7.2%, indicating a high risk of aneurysm rupture, therefore, the patient was scheduled for endovascular coil embolization.

Discussion
Although the initial presentation suggested peripheral vestibulopathy, atypical bidirectional nystagmus and significant vascular risk factors raised suspicion for a central cause. Basilar tip aneurysms may produce vertigo through compression of brainstem vestibular pathways, thromboembolic compromise of posterior circulation perforators, or hemodynamic insufficiency in diffuse atherosclerosis.

Conclusion
Basilar tip aneurysm is a rare central mimic of AVS. Recognition of atypical features and vascular risk factors should prompt early neurovascular imaging to prevent misdiagnosis and delayed management.

Keywords: Acute vestibular syndrome,Basilar tip aneurysm,Vertigo,Posterior circulation

ID_15 Case Report / Neuro-Immunology

Crisis & Constraint : The Role of Intravenous Steroids in Myasthenic Crisis When Resources are Lean

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Abstract

Background

Myasthenic crisis is a fatal complication of Myasthenia Gravis (MG), an autoimmune neuromuscular junction disorder. Standard Myasthenic crisis treatment which is Plasma exchange and Intravenous immunoglobulin (IVIg) are not widely accessible.

Case Summary

A 25-year-old female with history of MG, secondary epilepsy and bowel tuberculosis presented to Emergency Department with five days of fever, nausea, vomiting and diarrhea. Blood pressure was 142/129, while other vital signs were stable. Within 12 hours, she deteriorated into Myasthenic Crisis with respiratory distress requiring intubation. Myasthenia Gravis Activities of Daily Living (MG-ADL) Score was 19. Treatments include Methylprednisolone 3 x 125 mg, Pyridostigmine 4 x 60 mg and Levofloxacin 500 mg daily. Referral attemptst for plasmapheresis or IVIg therapy were unsuccessful due to limited access. During hospitalization, the patient experienced four seizures due to secondary epilepsy, treated with diazepam, fentanyl, loading dose midazolam, maintenance propofol and phenytoin. Despite the lack of standard therapies, her condition gradually improved and discharged on the 7th day with MG-ADL score 0

Discussion

Intravenous (IV) steroid remains as accessible therapy for myasthenic crisis. Evidence shows IV steroids can reduce hospital stay, intubation and intensive care duration. Mortality and muscle score were comparable to standard treatment.

Conclusion

Early IV steroid is essential in treating myasthenic crisis in limited-resource setting even in complex clinical cases.

Keywords: Myasthenic Crisis, Intravenous Steroids.

ID_16 Research / Neuro-Behavior

The Effect of Mangrove Leaf Extract (Rhizophora mucronata) on Working Memory and Spatial Memory in Sprague-Dawley Rats

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Abstract

Background
Oxidative stress triggers cognitive decline, affecting both working and spatial memory. Rhizophora mucronata leaves, rich in antioxidant flavonoids, offer potential neuroprotection. This study evaluated the effects of Rhizophora mucronata extract on working and spatial memory performance in Sprague–Dawley rats

Method
This post-test only experimental study used 20 male Sprague–Dawley rats (n=5/group): a negative control and three Rhizophora mucronata extract groups. Working memory was assessed via spontaneous alternation in a Y-maze. Spatial memory was evaluated through a two-trial recognition test (15-minute acquisition, 1-hour interval, and 5-minute test phase). Data were analyzed using One-Way ANOVA and post-hoc Tukey HSD ($p<0.05$)

Results
The Y-maze test demonstrated a dose-dependent improvement in both memory types. For working memory, the mean spontaneous alternation percentages were 20.00±20.00% (control), 38.50±16.42% (low), 62.43±4.18% (medium), and 63.40±16.79% (high). For spatial memory, the treatment groups (medium and high doses) showed a significant preference for the novel arm compared to the control group ($p<0.05$)

Discussion
The significant improvement in working and spatial memory indicates that Rhizophora mucronata extract, specifically at 800 and 1000 mg/kg BW, acts as a potent neuroprotective agent. Its high flavonoid content likely mitigates hippocampal oxidative stress, thereby preserving neuronal integrity and synaptic plasticity. These findings suggest the extract's efficacy in restoring the brain's ability to retain and process spatial information against oxidative-induced cognitive decline

Conclusion
Rhizophora mucronata extract significantly improved working and spatial memory in Sprague–Dawley rats, with 800 and 1000 mg/kg doses showing the highest efficacy. These results suggest its potential as a potent cognitive enhancer against oxidative related memory decline.

Keywords: Rhizophora mucronata, working memory, spatial memory, neuroprotection.

ID_17 Case Report / Other

Isolated Magnetic Gait as an Atypical Presentation of Subdural Hematoma in an Elderly Patient

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Abstract

Background
Subdural hematoma (SDH) is widely recognized as a great neurological imitator with highly variable clinical manifestations. In elderly patients, symptoms may be subtle and frequently occur without a history of head trauma. Isolated magnetic gait without focal neurological deficits is an exceptionally rare presentation, which may lead to delayed diagnosis.

Case Summary
An 82-year-old woman presented with a seven-day history of sudden inability to walk without preceding trauma, headache, or limb weakness. One month prior to admission, she had fallen from bed but did not sustain any direct head injury. Neurological examination showed preserved muscle strength and normal muscle tone in all extremities. However, the patient exhibited difficulty initiating steps with a shuffling pattern consistent with magnetic gait, without other focal neurological deficits. Brain computed tomography (CT) revealed bilateral acute-on-chronic SDH with mild frontal lobe compression and no significant mass effect. The patient underwent burr hole evacuation.

Discussion
Marked improvement in gait was observed following surgical drainage. Magnetic gait is associated with dysfunction of frontal–subcortical circuits, particularly the supplementary motor area and prefrontal cortex involved in gait initiation and postural control. Bilateral frontal compression from SDH may selectively disrupt these pathways while sparing corticospinal tracts, explaining the absence of motor weakness.

Conclusion
This case highlights that apparent lower limb weakness may mask a higher-order gait disorder despite preserved motor strength. In elderly patients with acute gait disturbance, subdural hematoma should be considered even without trauma history, and early neuroimaging is essential for timely management and good neurological outcomes.

Keywords: Elderly, magnetic gait, subdural hematoma

ID_19 Research / Neuro-Behavior

Single-Arm Meta-Analysis of the Efficacy and Tolerability for Sodium Oxybate and Low-Sodium Oxybate in Idiopathic Hypersomnia

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Abstract

Background

Idiopathic hyperinsomnia (IH) is a chronic disorder characterized by excessive daytime sleepiness, sleep inertia, and cognitive impairment. No medications were approved for IH until 2021. This study evaluated the efficacy and tolerability of sodium oxybate (SXB) and low-sodium oxybate (LXB) for IH treatment.

Method

We searched PubMed, Scopus, Cochrane, and Taylor & Francis for eligible studies published between 2016 and 2026. Data were pooled using a random-effects model. The primary endpoint was changes in the Epworth Sleepiness Scale (ESS) and Idiopathic Hypersomnia Severity Scale (IHSS) scores. The secondary endpoint was the incidence of adverse effects (AEs).

Results

Five studies from 278 articles were included, comprising 307 patients of whom 14.3% received SXB and 85.6% received LXB. Both ESS and IHSS scores were significantly improved with a reduction of 7.43 (95% CI [5.44 - 9.41]; $p < 0.00001$; $I2 = 93.3\%$) and 14.77 (95% CI [13.10 - 16.44]; $p < 0.00001$; $I2 = 74.5\%$) points from baseline, respectively. The pooled prevalence of AEs in 212 patients was 77.93% (95% CI [71.25 - 84.62]), with nausea (34.71%), headache (25.88%), and dizziness (22.44%) being the most common.

Discussion

SXB and LXB demonstrated an improvement in symptoms by reducing excessive sleepiness on the ESS and IH severity on aspects of IHSS. Variability in study protocol, dosage, and sample sizes may have influenced the outcomes. More large-scale studies are required.

Conclusion

SXB and LXB are effective pharmacological treatments with a reasonable safety profile for patients with IH.

Keywords: Excessive daytime sleepiness; Hypersomnolence; Idiopathic hypersomnia; Sodium oxybate.

ID_20 Research / Neuro-Imaging and Sonology

Distal Occlusion Tracker Sign for Post-Thrombectomy Residual Occlusion: A Diagnostic Test Accuracy Meta-Analysis

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Abstract

Background

Distal vessel occlusion (DVO) may influence the outcomes of endovascular treatment (EVT). The flat-panel detector CT distal occlusion tracker (DOT) sign has been reported in distal intracranial vessels and is associated with incomplete reperfusion. This study aimed to evaluate the diagnostic performance of the DOT sign in detecting DVO after EVT.

Method

A systematic search of PubMed, Scopus, Cochrane, and Taylor & Francis databases was conducted for studies on the diagnostic performance of DOT sign published between 2016 and 2026. The study's endpoints were pooled sensitivity and specificity. The quality of the study was assessed using the Quality Assessment of Diagnostic Accuracy Studies-2 tool.

Results

Fifteen articles were identified, three of which evaluated the correlation between the DOT sign and residual distal occlusion or incomplete reperfusion after EVT. The overall risk of bias and applicability concerns were low or unclear. The pooled sensitivity and specificity were 66.3% (95% CI=0.496 - 0.798) and 87,2% (95% CI=0.688 - 0.954), respectively.

Discussion

The DOT sign is a practical post-thrombectomy imaging marker that may represent residual thrombotic material. Previous studies have suggested that the DOT sign is associated with persistent hypoperfusion after treatment, indicating a higher risk of early neurological deterioration. Although the DOT sign has high specificity, it has relatively lower sensitivity for detecting all residual occlusions.

Conclusion

The DOT sign exhibits a moderate sensitivity and high specificity, promising a great addition for predicting patients who may benefit from additional therapies, thus mitigating persistent hypoperfusion and poorer outcome.

Keywords: Diagnostic accuracy, Distal occlusion tracker, Residual vessel occlusion, Endovascular treatment

ID_21 Research / Neuro-Oncology

Safety and Efficacy of Third-Generation Anti-Seizure Medications for Brain Tumor-Related Epilepsy

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Abstract

Background
Brain tumor-related epilepsy (BTRE) significantly impairs the quality of life in neuro-oncology patients. Managing BTRE is challenging due to potential drug interactions with chemotherapeutic agents and high rates of drug resistance. Third-generation anti-seizure medications (ASMs) offer stable pharmacokinetics and minimal drug interactions, yet a comprehensive synthesis of their efficacy and safety in BTRE remains limited.

Method
A systematic review was conducted by searching PubMed, Scopus, and Cochrane databases for studies published up to 2026. Studies evaluating third-generation ASMs, including lacosamide, brivaracetam, perampanel, eslicarbazepine, and cenobamate in patients with primary or metastatic brain tumors were included.

Results
Analysis of several clinical and observational studies involving over 1,000 patients indicates that third-generation ASMs provide a ≥50% seizure reduction in 50–75% of patients. Seizure freedom rates range from 15% to 41.5%.

Discussion
Lacosamide and brivaracetam show consistent efficacy as both add-on and monotherapy. Perampanel and eslicarbazepine also demonstrate significant seizure reduction with lower enzyme-inducing properties compared to older generations. Adverse effects, predominantly dizziness, somnolence, and fatigue, were reported in <20% of cases, with low treatment discontinuation rates (<15%).

Conclusion
Third-generation ASMs are effective and well-tolerated for BTRE management. Their favorable pharmacokinetic profiles and minimal interactions with systemic oncological therapies make them suitable options for optimizing seizure control without compromising cancer treatment. However, further large-scale prospective trials are warranted.

Keywords: brain tumor-related epilepsy, third-generation anti-seizure medications, efficacy, safety, neuro-oncology.

ID_22 Research / Movement Disorder

NON-MOTOR SYMPTOM PROFILE IN IDIOPATHIC PARKINSON'S DISEASE: A COMPARATIVE STUDY BETWEEN EARLY-ONSET AND LATE-ONSET PATIENTS

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Abstract

Background
Parkinson's disease (PD) presents with heterogeneous clinical manifestations, including a wide range of non-motor symptoms (NMS) that may vary according to age at onset. Understanding these differences may help optimize management approaches and improve quality of life. This study aimed to compare NMS burden between early-onset PD (EOPD) and late-onset PD (LOPD).

Method
This cross-sectional study included 53 patients with idiopathic PD, categorized as EOPD (≤55 years) or LOPD (>55 years) according to age at symptom onset. NMS were assessed using the Non-Motor Symptoms Questionnaire (NMS-Q), and comparisons between groups were analyzed using the Chi-square test and Fisher's exact test where appropriate. Effect sizes were expressed as Phi coefficients. Bonferroni correction was applied to adjust for multiple comparisons (corrected = 0.0017).

Results
Among 53 subjects, 16 (30.2%) were classified as EOPD. Significant differences were observed in several NMS items between groups. Anxiety (p=0.030), delusion (p=0.028), and hyperhidrosis (p=0.031) were significantly more prevalent among EOPD, whereas bowel incontinence (p=0.021) was more frequent in LOPD. All showed medium effect sizes, indicating meaningful differences between groups.

Discussion
These findings suggest that age at onset may influence the pattern of NMS in PD. The higher prevalence of anxiety and delusion in EOPD may reflect greater psychosocial impact and neuropsychiatric vulnerability among younger patients. In contrast, bowel incontinence in LOPD may be associated with age-related autonomic decline and comorbid conditions.

Conclusion
Recognizing these age-related patterns may help provide a more individualized evaluation and management of non-motor manifestations in PD.

Keywords: non-motor symptoms, NMS-Q, Parkinson's disease, early-onset Parkinson, late-onset Parkinson.

ID_23 Case Report / Neuro-Behavior

SEMANTIC VARIANT PRIMARY PROGRESSIVE APHASIA IN A 52-YEAR-OLD MALE WITH PROBABLE ALZHEIMER'S DISEASE: A CASE REPORT

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Abstract

Background

Primary progressive aphasia (PPA) refers to a group of neurodegenerative disorders presenting with gradual decline in speech and language, without relatively preserved cognitive, physical, and behavioral functions. Its prevalence is 3-4 per 100.000 individuals, with an average age onset of 60 years, affecting both men and women equally. We report a case of PPA associated with probable Alzheimer's disease (AD).

Case Summary

A 52 year-old, right-handed male presented with a 2-year history of progressive word-finding difficulty and impaired comprehension. He was a college graduate working in a company's monitoring division with no significant medical history. His family reported increasing difficulty understanding conversations and instructions, including inability to name colors. Gradual cognitive decline eventually affected his work performance. Examination showed preserved repetition and writing, but impaired verbal fluency, comprehension, and reading. Brain MRI demonstrated lacunar white matter lesions in the bilateral frontal and left parietal lobes, as well as hippocampal atrophy with a medial temporal lobe atrophy (MTA) score of 2. He was diagnosed with semantic variant PPA (svPPA) associated with AD and educated regarding self-practice therapies.

Discussion

Although PPA is strongly associated with frontotemporal dementia (FTD) or AD, the majority of the semantic variants (75-100%) are linked to an underlying FTD pathology. In this patient, the presence of anomia and agnosia with preserved repetition supports the diagnosis of svPPA. Albeit uncommon, the clinical and neuroimaging findings suggest AD as the possible underlying neurodegenerative process.

Conclusion

Early recognition of PPA variants is essential to guide diagnostic evaluation, counseling, and appropriate language-focused therapeutic strategies.

Keywords: aphasia, primary progressive aphasia, semantic primary progressive aphasia, Alzheimer's disease

ID_24 Case Report / Neuro-Immunology

Overlap Syndrome Guillain-Barre and Acute Transverse Myelitis Following Appendectomy

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Abstract

Background
Acute transverse myelitis (ATM) and Guillain–Barré syndrome (GBS) are immune mediated neurological disorders. The overlap syndrome is the occurrence of both conditions simultaneously or sequentially, is rare. This article presents case of GBS ATM overlap syndrome following appendectomy.

Case Summary
A 16-year-old female developed progressive weakness in both legs, parasthesia in the limbs, facial nerve paralysis, urinary and fecal retention that occurred ten days after an appendectomy with wound dehiscence. Neurological examination revealed lower limb weakness, hyporeflexia, and impaired sensation below the T6 level bilaterally with prolonged fever. Blood culture, anti DS DNA and ANA test were found negative. Electromyography indicated polyneuropathy and axonal demyelination. Serial cerebrospinal fluid (CSF) analysis showed albuminocytologic dissociation. The magnetic resonance imaging (MRI) examination confirmed spinal cord inflammation. The patient had undergone plasma exchange four times and corticosteroids but no improvement in neurological deficits.

Discussion
GBS is characterized by symmetrical ascending limb weakness and hyporeflexia, while ATM involves spinal cord inflammation without compression leading to motor, sensory, or autonomic dysfunction. GBS ATM overlap syndrome pose diagnostic and therapeutic challenges, particularly when recovery is slower than expected. Surgical stress and postoperative infection can trigger immune responses. Electrophysiology and MRI, are key diagnosis, but no guidelines exist for treatment in these cases.

Conclusion
GBS ATM overlap syndrome is a rare condition associated with poor neurological recovery. Early diagnosis dan identification of etiology is crucial. Further studies are needed to establish optimal treatment strategies.

Keywords: Guillain–Barré syndrome, acute transverse myelitis, appendectomy, plasma exchange

ID_25 Research / Neuro-Vascular

Determinants of In-hospital Mortality in Hemorrhagic Stroke: Case-Control Study at a District Hospital, Indonesia

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Abstract

Background
Stroke remains one of the major health problems in Indonesia, particularly among individuals aged ≥55 years. Hypertension is the leading modifiable risk factor, with stroke risk increasing at systolic blood pressure (SBP) ≥140 mmHg and diastolic blood pressure (DBP) ≥90 mmHg. However, other systemic factors may also influence outcomes. This study aimed to evaluate in-hospital mortality and identify factors associated with mortality using a case–control design at a district hospital in West Java.

Method
A retrospective case-control study included 104 patients with hemorrhagic stroke admitted to Regional General Hospital of Ciamis between January 2023 and September 2024. Clinical, laboratory, and radiological data were obtained from medical records. Multivariable logistic regression was performed to identify factors associated with in-hospital mortality.

Results
Among 104 patients, 26 (25%) died during hospitalization. In multivariable logistic regression analysis, initial DBP >90 mmHg, serum creatinine (SCr) ≥1.495 mg/dL, and hemorrhagic volume >30 mL were independent predictors of in-hospital mortality. DBP > 90 mmHg exhibited higher odds of mortality than those with DBP ≤ 90 mmHg (aOR = 5.63 [95% CI: 1.58 – 20.05]; p = 0.008). Correspondingly, SCr ≥ 1.495 mg/dL (aOR = 10.56 [95% CI: 1.27 – 87.51]; p = 0.029) and hemorrhagic volume > 30 mL (aOR = 7.56 [95% CI: 2.37 – 24.27]; p = 0.001) were associated with higher odds of mortality.

Discussion
Elevated DBP, impaired renal function, and larger hemorrhagic volume were associated with increased in-hospital mortality in hemorrhagic stroke.

Conclusion
Early identification of these factors may help clinicians recognize high-risk patients and guide management.

Keywords: hemorrhagic stroke; in-hospital mortality; impaired renal function

ID_26 Case Report / Neuro-Vascular

A Rare Case of Large Vessel Occlusion Stroke in a Young Adult: A Case Report

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Abstract

Background

Large vessel occlusion (LVO) strokes represent about 15–30% of ischemic strokes, and they are associated with high morbidity and mortality. Altough strokes commonly affect older individuals, new findings indicate an increasing incidence among young adults. The heterogeneous etiologies and risk factors in this population make diagnosis and management of this condition challenging.

Case Summary

A 32-year-old male patient visited the hospital with sudden-onset left hemiparesis and slurred speech that began approximately two hours prior to admission. The patient had a history of smoking, a sedentary lifestyle, migraines, irregular sleep patterns related to night-shift work, and a family history of stroke and hypertension. Importantly, he had no prior history of hypertension or diabetes mellitus. Neurological examination revealed left hemiparesis with left central facial and hypoglossal nerve paresis. A non-contrast head CT identified occlusion in the right middle cerebral artery with an Alberta Stroke Program Early CT Score (ASPECTS) of 6. The patient was treated with antiplatelet and supportive treatment. Clinical follow-up showed mild residual symptoms and improvement in motor strength.

Discussion

LVO stroke is relatively rare in young adults and is commonly linked with heterogeneous etiologies. This case emphasizes that early cerebrovascular events may occur even in the absence of traditional vascular risk factors, highlighting the role of lifestyle and familial predisposition in young-onset stroke.

Conclusion

Early recognition of stroke symptoms and risk factor identification are essential to improving the prevention and management of LVO stroke in young adults

Keywords: large vessel occlusion, acute ischemic stroke, young adult stroke

ID_27 Case Report / Neuro-Infection

Moderate-Grade Generalized Tetanus with Trismus Symptom in A Patient with Infected Suture Wound: A Case Report

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Abstract

Background
Tetanus is an acute neurological disorder characterized by increased muscle tone and intermittent muscle spasms caused by tetanospasmin, an exotoxin produced by Clostridium tetani. Tetanus can rapidly progress into life-threatening muscle rigidity by respiratory insufficiency with or without autonomic dysfunction.

Case Summary
A 51-years-old male presented with an inability to open his mouth accompanied by stiffness of the chest and abdomen for approximately three days prior to admission. On physical examination, the patient was fully conscious (GCS E4V5M6), blood pressure was 108/83 mmHg, and other vital signs within normal limits. Clinical findings revealed trismus with one-finger breadth mouth opening, risus sardonicus, abdominal rigidity and infected suture wound on the left forearm. Chest radiographs showed no abnormalities. Based on clinical findings and philips score are 14, the patient was cathegorized with moderate grade generalized tetanus.

Discussion
Infection by Clostridium tetani through an open wound can lead to tetanus, with muscle rigidity as a prominent manifestation. This patient received Human Tetanus Immunoglobulin (HTIG), sedative therapy, supportive symptomatic therapy and managed in the intensive care unit for 12 days.

Conclusion
Moderate-grade tetanus presenting with muscle rigidity and autonomic dysfunction is a medical emergency requiring immediate recognition and management. Early and appropriate treatment is essential in determining neurological outcomes and overall prognosis.

Keywords: Tetanus, trismus, Clostridium tetani

ID_28 Case Report / Neuro-Vascular

COGNITIVE AND LANGUAGE RECOVERY IN POST-STROKE VASCULAR COGNITIVE IMPAIRMENT: A CASE REPORT

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Abstract

Background

Vascular cognitive impairment (VCI) comprises a spectrum of cognitive deficits resulting from cerebrovascular pathology, and represents the second leading cause of dementia after Alzheimer's disease. Post-stroke cognitive impairment is a common manifestation of VCI, and frequently involves multiple cognitive domains.

Case Summary

A 50-year-old female presented with a 2-week history of sudden-onset speech difficulty. She exhibited preserved comprehension with impaired speech fluency and word-finding difficulty. Past medical history was notable for hypertension and type-2 diabetes mellitus. Neurological examination revealed transcortical motor aphasia, without motor or sensory deficits. Neuropsychological assessment demonstrated significant cognitive impairment (MMSE 18, MoCA 11), predominantly affecting verbal fluency and naming, while repetition and comprehension were preserved. Additional impairments were noted in memory, executive function, and complex calculation. Brain MRI revealed a subacute infarct involving the left basal ganglia extending to the corona radiata, with evidence of an old infarct in the right basal ganglia. A diagnosis of VCI secondary to ischemic stroke was made. She received standard stroke management, speech therapy, and transcranial magnetic stimulation (TMS). At 3-month follow-up, marked improvement in both cognitive and language functions were observed (MMSE 28, MoCA 27).

Discussion

The acute onset and pattern of cognitive deficits, together with neuroimaging, support a vascular etiology over a primary neurodegenerative process. Notably, the patient exhibited substantial cognitive recovery, reflected by marked improvements in MMSE and MoCA scores, following timely medical management combined with rehabilitation and neuromodulation therapies.

Conclusion

This case highlights the potential reversibility of post-stroke VCI, especially when addressed through timely and multidisciplinary intervention.

Keywords: aphasia, neurocognitive impairment, vascular cognitive impairment, stroke, vascular.

ID_29 Case Report / Neuro-Vascular

Acute Subdural Hematoma as a Rare Presentation of Cerebral Arteriovenous Malformation

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Abstract

Background

Subdural hematoma (SDH) resulting from rupture of an arteriovenous malformation (AVM) is rare compared with other intracranial hemorrhages such as intracerebral or subarachnoid hemorrhage. In Indonesia, only a few cases have been reported. AVM is a congenital vascular anomaly characterized by abnormal connections between arteries and veins without an intervening capillary bed. AVM presenting as SDH poses diagnostic and therapeutic challenges.

Case Summary

A 35-year-old woman was referred from a private hospital with sudden loss of consciousness preceded by severe headache and seizure. Neurological examination showed no cranial nerve or sensorimotor deficits. Head CT scan revealed an acute subdural hematoma in the right frontotemporoparietal region without any history or signs of head trauma. Further evaluation with CT angiography followed by cerebral angiography demonstrated an AVM in the right temporal region, supplied by branches of the right middle cerebral artery (MCA) M3 segment with venous drainage to the superior petrosal sinus, consistent with Spetzler–Martin Grade II.

Discussion

SDH caused by AVM is uncommon. Several mechanisms have been proposed, including tearing of the arachnoid layer attached to the AVM due to brain movement, rupture of superficial draining veins, or rupture of cortical arteries connecting the cortex to the dura. Vascular imaging is essential to identify the bleeding source and guide management.

Conclusion

Although rare, AVM should be considered a potential cause of non-traumatic SDH, particularly in young patients. Early diagnosis through angiographic evaluation is important to determine appropriate management and prevent further complications.

Keywords: Arteriovenous malformation, Subdural hematoma, Cerebral angiography.

ID_30 Case Report / Neuro-Infection

Unilateral Ramsay Hunt Syndrome in Diabetic Patient with Multiple Cranial Nerve Involvement: A Case Report

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Abstract

Background

Ramsay Hunt Syndrome (RSH) commonly presents unilateral facial palsy due to reactivation of Varicella Zoster Virus (VZV) in geniculate ganglion of the facial nerve. Additional manifestations may occur depending on the involvement of other cranial nerves. Diabetic patients are relatively immunocompromised which may increase the risk of developing RSH.

Case Summary

A 57-year-old-man with diabetes mellitus (DM) presented with a history of otalgia characterized by paroxysmal, radiating, sharp pain with a burning sensation. The patient also developed unilateral left facial palsy (CN VII;House-Brackmann score V), masticatory dysfunction (CN V), dysphagia (CN IX, X), and ipsilateral tongue deviation (CN XII). One week prior to admission, a vesicular rash appeared in the periauricular region and left cheek. At admission, the patient had hyperglycemia and was treated with metformin, glimepiride, oral acyclovir, tramadol, gabapentin and amitriptyline. After two weeks, HB score improved to II, with improved mastication ability.

Discussion

Hyperglycemia induced immunocompromised state characterized by decreased cytokine production, impaired phagocytosis, and immune cell dysfunction. Ganglionitis, a notable mechanism of RSH, is not limited to the geniculate ganglion but may extend along the facial nerve and involve adjacent ganglia such as gasserian, petrous, accessory, jugular, plexiform, and second/third cervical dorsal root ganglia. Other theories explaining cranial polyneuropathy suggest direct viral spread along perineural anastomotic pathway or via vasculitis affecting vascular supply of CN V, VII, IX, X, XI, and XII.

Conclusion

Multiple cranial nerve involvement may occur in RHS patients with DM. Comprehensive clinical evaluation is essential for early recognition, leading to better outcomes.

Keywords: Ramsay Hunt Syndrome, diabetes mellitus, facial nerve palsy, cranial polyneuropathy

ID_31 Case Report / Neuro-Trauma

Case Report: Methylprednisolone at High Doses in Spinal Shock

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Abstract

Background
The acute period of spinal cord injury (SCI) is spinal shock which symptomps are hypotonia, areflexia, and autonomic. Within the first 8 hours, initial management involves hemodynamic stabilization, spinal immobilization, and high-dose methylprednisolone in order to reduce secondary damage to the spinal cord.

Case Summary
Following a fall, A 71-year-old male patient, had tetraparesis, loss of sensation below the T3-T4 level, and urinary retention. After examination then revealed areflexia, lower limb hypotonia, and absence of pathological reflexes. MRI shows severe central canal stenosis at C6-C7, spinal cord edema, multilevel disc degeneration at C3-T1, and mild stenosis at T3-T4. Diagnosed with spinal shock and post-traumatic spinal cord injury (ASIA B), received cervical mobilization, high-dose methylprednisolone, and metabolic stabilization. The patient was given cervical mobilization, high-dose methylprednisolone, and metabolic stabilization. The patient had improved power in the upper limb (3/5) and light movement in the lower limbs (1-2/5). The patient had increased sensation below the level of T3-T4 with recovery of reflexes and poor bladder function.

Discussion
High-dose methylprednisolone in SCI is still debatable because of the adverse effects of hyperglycemia and infection. However, it was selected for this patient to reduce secondary injury from edema and because the patient was less than 8 hours post-injury. Throughout spinal shock period, High-dose methylprednisolone is expected to brace neurological rehabilitation

Conclusion
High-dose methylprednisolone can help neurological recovery and reduce secondary damage in SCI

Keywords: spinal shock, spinal cord injury, high-dose methylprednisolone

ID_32 Research / Neuro-Vascular

Association Between Hyponatremia and Length of Stay in Ischemic Stroke

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Abstract

Background
Stroke is the third leading cause of death in the world. Of all strokes, about 80% are ischemic strokes. Disturbances in sodium levels in the form of hyponatremia are the most common electrolyte abnormalities. Ischemic stroke patients with hyponatremia tend to have delayed-in hospital recovery. The purpose of this study is to determine the association between hyponatremia and length of stay in ischemic stroke patients.

Method
This analytic observational study used a retrospective cohort design. Data were obtained from medical records of ischemic stroke patients treated at Abdul Moeloek Hospital between January 2019 and December 2020. A total of 56 samples were selected using purposive sampling and analyzed using the chi-square test.

Results
Based on the results of this study, the distribution of ischemic stroke patients according to sodium levels: 22 samples (39.3%) had hyponatremia, and 19 samples (86.4%) had a longer length of stay (> 4 days). In bivariate analysis, it was found that there was a significant association between hyponatremia and length of stay in ischemic stroke patients ($p = 0.002$).

Discussion
Hyponatremia in ischemic stroke is often associated with the syndrome of inappropriate antidiuretic hormone secretion (SIADH) or cerebral salt wasting syndrome (CSWS), which may lead to cerebral edema and worsening neurological outcomes. These mechanisms may contribute to prolonged hospitalization in affected patients.

Conclusion
There is a significant association between hyponatremia and length of stay in ischemic stroke patients.

Keywords: hyponatremia, sodium level, ischemic stroke, length of stay

ID_33 Case Report / Neuro-Vascular

Acute Cerebral Venous Sinus Thrombosis Mimicking an Intracerebral Bleeding Tumor: A Case Report

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Abstract

Background
Cerebral Venous Sinus Thrombosis (CVST) is a rare cerebrovascular disorder with diverse clinical manifestations, often mimicking other intracranial conditions, including brain tumor. The variability in presentation and risk factors may delay diagnosis and treatment, making diagnosis challenging. Early recognition and timely management are crucial to prevent permanent neurological impairment.

Case Summary
A 35-year-old male presented with headache, nausea, vomiting, and recurrent generalized seizures. Initial neurological assessment showed right hemiparesis, global aphasia, and uncontrollable seizure leading to status epilepticus, which requires the patient to be intubated. Neuroimaging revealed a linear hyperdense lesion with surrounding hypodensity in the left parietal, raising suspicion of vascular malformation or hemorrhagic intracranial lesion. Further evaluation in imaging revealed thrombosis involving superior sagittal, left transverse, and left sigmoid sinuses. Digital Subtraction Angiography (DSA) confirmed extensive cerebral venous sinus thrombosis at superior sagittal sinus (SSS). Mechanical thrombectomy and balloon angioplasty was performed, resulting in significant neurological improvement with well-controlled seizure. Post-procedure management included anticoagulation, antiepileptic, supportive care, and multidisciplinary rehabilitation. Follow-up examinations showed stable neurological status with preserved consciousness.

Discussion
CVST presents with symptoms that often mimic other intracranial pathologies, making diagnosis more challenging. Neuroimaging and DSA are essential in confirming the diagnosis. Endovascular mechanical thrombectomy may be considered in severe cases with acute extensive sinus occlusion and neurological deterioration due to cerebral vein hypertension.

Conclusion
CVST is a rare but potentially life-threatening condition with diverse clinical presentations. Early neuroimaging and timely intervention, including mechanical thrombectomy in selected cases may lead to favorable neurological outcomes.

Keywords: Cerebral Venous Sinus Thrombosis, Mechanical Thrombectomy, Seizure, Hemiparesis

ID_34 Case Report / Neuro-Trauma

Clinical–Neurobehavioral Recovery After Severe Traumatic Brain Injury with Diffuse Axonal and Hemorrhagic Injury: A Longitudinal Case Report

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Abstract

Background

Severe traumatic brain injury (TBI), particularly with suspected diffuse axonal injury, is traditionally associated with high morbidity and unfavorable neurological outcomes. Admission Glasgow Coma Scale (GCS) remains a key prognostic indicator; however, outcome variability is increasingly recognized.

Case Summary

A 31-year-old male presented after a motorcycle accident with initial GCS E1M3V2. He required intubation, mechanical ventilation, intensive care management, and early tracheostomy. MRI after hospitalization demonstrated late subacute right frontal intracranial hemorrhage and right frontotemporal subdural hemorrhage without mass effect. The patient experienced global aphasia during the acute phase and was discharged to homecare after stabilization. At five-month follow-up, comprehensive neurobehavioral evaluation revealed GCS 15, preserved motor function, intact executive and visuospatial abilities, and mild delayed verbal memory impairment (MMSE 29/30; MoCA-INA 28/30).

Discussion

Despite severe initial presentation, the patient demonstrated substantial neurological and cognitive recovery. Prevention of secondary brain injury, structured rehabilitation, and young age may have contributed to favorable outcome.

Conclusion

Severe TBI with hemorrhagic and axonal features does not uniformly predict poor cognitive prognosis. Objective long-term neuropsychological assessment is essential for accurate functional evaluation.

Keywords: traumatic brain injury; diffuse axonal injury; cognitive outcome; neurobehavioral assessment; tracheostomy

ID_35 Case Report / Neuro-Infection

When Improvement Deceives: Paradoxical Intracranial Tuberculoma During Treatment of Tuberculous Meningitis

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Abstract

Background

Paradoxical reactions (PR), defined as clinical or radiological worsening after an initial response to appropriate antituberculous therapy still remains a significant diagnostic and therapeutic challenge. Failure to recognize PR, particularly in central nervous system involvement, increases the risk of progressive neurological deterioration and permanent deficits.

Case Summary

A 29-year-old female with previously improving tuberculous meningitis developed worsening headache and new focal neurological deficits three months after initiation of antituberculous therapy. Follow-up brain magnetic resonance imaging demonstrated multiple newly developed ring-enhancing lesions consistent with intracranial tuberculomas. Cerebrospinal fluid analysis showed improving inflammatory parameters without evidence of alternative infection. Based on the clinical course and imaging findings, a paradoxical reaction was suspected. The patient was managed with continuation of antituberculous therapy along with adjunctive corticosteroids (dexamethasone 0.4 mg/kg with gradual tapering every 2 weeks), leading to gradual clinical and radiological improvement.

Discussion

Paradoxical reactions in central nervous system tuberculosis are believed to result from an exaggerated host immune response to mycobacterial antigens released during appropriate therapy and should be differentiated from alternative diagnoses or treatment failure. While corticosteroids are considered the mainstay therapy in PR, the optimal dose and duration have not been well established, as treatment should be individualized according to disease severity and clinical response.

Conclusion

Intracranial tuberculoma may arise as a paradoxical reaction during treatment of tuberculous meningitis. Awareness of this condition is important to prevent progressive neurological deterioration, avoiding unnecessary modification of antituberculous therapy, and appropriate corticosteroid dosing.

Keywords: tuberculous meningitis, paradoxical reaction, intracranial tuberculoma, case report

ID_36 Research / Neuro-Vascular

Does Admission Glasgow Coma Scale Score Predict Mortality in Hemorrhagic Stroke? A Retrospective Cohort Study in a Regional Hospital

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Abstract

Background
Intracerebral hemorrhage (ICH) is a life-threatening neurological emergency associated with high mortality worldwide. The Glasgow Coma Scale (GCS) has been proposed as a predictor of clinical outcomes in patients with hemorrhagic stroke. However, the predictive value of GCS remains variable across different healthcare settings.

Method
A retrospective cohort study was conducted using medical records of patients diagnosed with hemorrhagic stroke from January until December 2025. Data collected included demographic characteristics, admission GCS score, and patient outcomes. GCS scores were categorized into several categories. The primary outcome was in-hospital mortality. Statistical analysis was performed using Chi-square test to evaluate association between GCS categories and mortality, with a significance level of $p<0.05$.

Results
A total of 139 patients with hemorrhagic stroke were included in the study. Among them, 79 patients (56.8%) survived and the rest died during hospitalization. The distribution of admission GCS scores was 42 patients (GCS 3–8), 47 patients (GCS 9–12), 9 patients (GCS 13–14,) and 41 patients (GCS 15). Chi-square analysis demonstrated no statistically significant association between admission GCS score and in-hospital mortality ($p=0.992$).

Discussion
Admission GCS score was not significantly associated with in-hospital mortality among patients with hemorrhagic stroke in this study. Our findings suggest that GCS alone may not adequately capture the complexity of hemorrhagic stroke severity. Previous studies have shown that multidimensional prognostic scoring systems, such as ICH Score, may provide more accurate prediction of outcomes.

Conclusion
These findings highlight the importance of comprehensive prognostic assessment, particularly in regional hospitals with limited resources, to improve management of hemorrhagic stroke patients.

Keywords: Intracerebral hemorrhage, Glasgow Coma Scale, mortality

ID_37 Case Report /
Neurophysiology (Peripheral Nerve & Neuromuscular)

Atypical Presentation of Guillain-Barre Syndrome: Acute Inflammatory Demyelinating Polyneuropathy with Miller Fisher Variant in a 38-Year-Old Woman

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Abstract

Background
Guillain-Barre Syndrome (GBS) is an acute immune-mediated polyneuropathy, with acute inflammatory demyelinating polyradiculoneuropathy (AIDP) being the most common subtype. Miller Fisher Syndrome (MFS) is a rare variant characterized by ophthalmoplegia, areflexia, and sensory disturbance. Overlap between these subtypes is uncommon and may pose diagnostic challenges due to prominent cranial nerve involvement.

Case Summary
A 38-year-old woman presented with headache, dizziness, generalized paraesthesia, gait instability, and visual disturbance. Neurological examination revealed bilateral ophthalmoplegia, areflexia, sensory impairment in the upper and lower extremities, and multiple cranial nerve involvement, involving cranial nerves III, IV, VI, VII. Limb motor strength was preserved. Based on clinical findings, neurophysiology studies, cerebrospinal fluid (CSF) analysis, the patient was diagnosed with GBS. The patient received multidisciplinary management, including intravenous immunoglobulin (IVIG), supportive treatment, and rehabilitation with physical and speech therapy. Gradual neurological improvement was observed during follow-up, particularly in sensory symptoms, facial muscle movement, and functional mobility.

Discussion
Overlap between AIDP and MFS may present with a combination of cranial neuropathies, sensory disturbances, and variable motor involvement, which can challenge diagnostic process. Early identification and prompt treatment may improve neurological outcomes and prevent potential complications.

Conclusion
GBS may present with a broad clinical spectrum, including atypical manifestations, particularly when overlapping with MFS. Early detection of this overlap may facilitate accurate diagnosis and comprehensive neurological management.

Keywords: Guillain-Barre Syndrome, Miller Fisher Syndrome, Ophthalmoplegia, Cranial nerve palsy, Intravenous immunoglobulin

ID_38 Research / Neuro-Vascular

Is Tenecteplase Ready to Replace Alteplase as a Bridging Therapy Before Endovascular Thrombectomy? A Systematic Review and Meta-Analysis

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Abstract

Background
Tenecteplase (TNK) is a modified tissue plasminogen activator with pharmacological and practical advantages over alteplase for intravenous thrombolysis in acute ischemic stroke (AIS). The superiority of TNK compared to alteplase as a bridging therapy before endovascular thrombectomy (EVT) remains uncertain.

Method
We searched PubMed, Scopus, and ClinicalKey for randomized controlled trials (RCTs) and observational studies conducted between February 21, 2016 until February 21, 2026 comparing tenecteplase versus alteplase patients with AIS eligible for EVT. Primary outcomes were functional (modified Rankin Score, 0-2) at 3 months and successful reperfusion (mTICI 2b-3). Secondary outcomes were mortality at 3 months and intracranial hemorrhage (ICH) transformation post-EVT.

Results
Ten studies were included (5 RCT and 5 observational studies). Tenecteplase demonstrated comparable functional independence at 90 days compared with alteplase (RR 1.07, 95% CI 0.94–1.22) but showed a slightly higher rate of successful reperfusion (RR 1.03, 95% CI 1.00–1.07; p value = 0.035). No significant differences were observed in 90-day mortality (RR 1.02, 95% CI 0.89–1.16) or ICH (RR 1.01, 95% CI 0.90–1.13).

Discussion
The higher reperfusion rate observed with TNK may be attributable due to its higher fibrin specificity, longer half-life, and reduced inhibition by plasminogen activator inhibitor-1. However, this difference was not associated with improved clinical outcomes.

Conclusion
Tenecteplase demonstrated non-inferiority and appeared to be as effective as alteplase when used as bridging therapy prior to EVT; thus, alteplase remains a valid evidence-based option in settings where TNK is unavailable.

Keywords: Alteplase, Tenecteplase, Bridging Therapy, Endovascular Thrombectomy, Intracranial Hemorrhage, Mortality, mRS, Reperfusion Rate

ID_39 Case Report / Movement Disorder

Possible Progressive Supranuclear Palsy: Diagnostic Challenges and Clinical Approaches

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Abstract

Background

Progressive Supranuclear Palsy (PSP) is a progressive neurodegenerative disorder that presents a diagnostic challenge. In its early stages, the clinical features overlap other parkinsonian and neurodegenerative disorders, and the absence of specific biomarkers further complicates early recognition. As a result, diagnosis is often delayed, which may impact treatment planning and patients' quality of life.

Case Summary

A 71-year-old man presented with a one-year history of progressive balance impairment, accompanied by recurrent falls. Neurological examination revealed marked postural instability, akinesia, axial rigidity, and cognitive impairment. Brain magnetic resonance imaging (MRI) demonstrated the hummingbird sign and morning glory sign, with a third ventricle-to-internal skull diameter ratio (3rdV/ID) of 9.51. The patient showed a poor response to dopaminergic therapy (levodopa). Based on the Movement Disorder Society criteria, the clinical findings were consistent with a diagnosis of possible PSP.

Discussion

This case highlights the diagnostic complexity of PSP, particularly because of its overlap with other parkinsonian syndromes and the lack of a definitive diagnostic test. Accurate diagnosis relies on comprehensive clinical assessment, evaluation of levodopa responsiveness, cognitive testing, and supportive neuroimaging findings. Although certain MRI features can provide valuable objective evidence in differentiating PSP from Parkinson's disease, the diagnosis remains primarily clinical and probabilistic.

Conclusion

The diagnosis of PSP depends on integrating clinical findings, cognitive assessment, treatment response, and neuroimaging results. A multidisciplinary approach is essential to promote earlier recognition and optimize supportive management strategies.

Keywords: Progressive supranuclear palsy; atypical parkinsonism; akinesia; cognitive impairment; levodopa resistance

ID_40 Research / Other

Geriatric Syndromes Among Neurogeriatric Outpatients in Indonesian Tertiary Healthcare Center

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Abstract

Background

Population aging is accelerating worldwide and raises concern about a potential "silver tsunami" that may reshape healthcare systems. Older adults with neurological disorders frequently present with coexisting geriatric syndromes, such as falls and functional dependence, resulting in greater clinical complexity. This study aimed to describe the clinical characteristics, neurological diagnoses, and prevalence of geriatric syndromes among patients attending a neurogeriatric outpatient clinic at Cipto Mangunkusumo Hospital.

Method

A cross-sectional study was conducted using medical records of patients aged ≥60 years who had at least one visit to the neurogeriatrics outpatient clinic between January and December 2025.

Results

A total of 447 patients were included (median age 72 years; 58.6% women). Ischemic stroke was the most common neurological diagnosis (33.8%). Geriatric syndromes were common, particularly polypharmacy (88.4%; median nine medications), functional dependence (56.8%) and frailty (54.1%). Cognitive impairment occurred in 51.5%, most commonly vascular cognitive impairment (13.7%) and mixed-type dementia (8.5%). Comprehensive geriatric assessment showed generally preserved median functional, nutritional, and psychological scores.

Discussion

The findings reflect the growing impact of population aging on neurological practice. The high prevalence of cerebrovascular disease and cognitive impairment reflects the vulnerability of the aging brain to vascular and neurodegenerative processes. The coexistence of multiple geriatric syndromes highlights the multidimensional challenges encountered in neurogeriatric care.

Conclusion

Neurogeriatric patients demonstrate a high prevalence of cerebrovascular disease, cognitive impairment, and multiple geriatric syndromes. These results emphasize the importance of comprehensive geriatric assessment to better identify and manage the complex needs of older patients with neurological disorders.

Keywords: comprehensive geriatric assessment; cognitive impairment; geriatric syndrome; neurogeriatrics

ID_41 Research / Neuro-Immunology

Serum Glial Fibrillary Acidic Protein and Neurofilament Light Chain as Biomarkers for Assessing Disease Severity in Neuromyelitis Optica Spectrum Disorder: A Systematic Review

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Abstract

Background
Reliable biomarkers for disease severity in neuromyelitis optica spectrum disorder (NMOSD) remain limited. This review evaluates the potential role of serum glial fibrillary acidic protein (sGFAP) and neurofilament light chain (sNfL) in reflecting disease severity.

Method
Studies published in the past five years were identified through PubMed, Google Scholar, ScienceDirect, and Embase, using keywords related to NMOSD, GFAP, and NfL. The quality of all included studies was assessed using the Newcastle-Ottawa Scale (NOS).

Results
Ten good-quality studies comprising 659 patients were included. sGFAP correlated significantly with Expanded Disability Status Scale (EDSS) in 8/10 studies, particularly during acute attacks. sNfL correlated with EDSS in 6/10 studies, while 4 studies reported no significant association.

Discussion
sGFAP appears to be a more reliable biomarker for assessing disease severity in NMOSD than sNfL, given its stronger and more consistent correlation with EDSS scores. This aligns with NMOSD pathophysiology as an antibody-mediated astrocytopathy, in which astrocytes represent the primary target of immune-mediated injury. As GFAP is abundantly expressed in astrocytes, elevated sGFAP levels directly reflect disease-specific astrocytic damage. In contrast, sNfL, a structural component of neuronal axons, primarily reflects secondary neuroaxonal injury occuring downstream of astrocyte damage. Consequently, while sNfL indicates broader neuroaxonal injury within the central nervous system, sGFAP more specifically reflects the primary pathological mechanism of NMOSD and may therefore provide a more specific indicator of disease severity.

Conclusion
sGFAP may serve as a more specific and reliable biomarker than sNfL for assessing disease severity in NMOSD due to its closer association with astrocyte-mediated pathology.

Keywords: neuromyelitis optica spectrum disorder, glial fibrillary acidic protein, neurofilament light chain

ID_45 Case Report / Neuro-Vascular

Multiple Infarct Brainstem Present With Weber Syndrome: A Rare Case Report

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Abstract

Background
Weber syndrome is a ventromedial midbrain stroke characterized by crossed hemiplegia by oculomotor nerve deficits. Multiple brainstem infarcts can expand the findings to widespread manifestations.

Case Summary
A 58-year-old woman presented with a 7-day history of diplopia, accompanied by vertigo that worsened when both eyes were open and improved when one eye was closed. The symptoms were associated with nausea and vomiting for three days and ocular deviation for seven days. The patient had a history of uncontrolled hypertension and type 2 diabetes mellitus. Physical examination revealed a blood pressure of 197/110 mmHg. Neurological examination showed right lower motor neuron facial nerve palsy, sensory disturbance in the left V2 distribution, right eye diplopia with exotropia, right tongue deviation, and hemiparesis with pronator drift. Laboratory results hyperglycemia (227 mg/dL). Brain imaging revealed infarctions in the right mesencephalon and left pons.

Discussion
The clinical presentation is consistent with Weber syndrome, a midbrain stroke characterized by ipsilateral oculomotor nerve weakness and contralateral hemiparesis. The patient exhibited right oculomotor nerve deficits, including exotropia and diplopia, by alternating hemiparesis, consistent with a ventromedial mesencephalon lesion on imaging. Multiple infarcts make the clinical picture atypical or an overlap syndrome with broader manifestations. Management began in the subacute phase, showing partial neurological improvement.

Conclusion
Multiple infarcts manifesting as Weber syndrome help determine the location of the lesion in cases of alternating hemiparesis. Even the patient arrives outside acute phase, significant neurological improvement can indicate a favorable prognosis.

Keywords: weber syndrome, multiple infark, brainstem, hemiparesis alternas

ID_46 Case Report / Neuro-Oncology

Glioblastoma Multiforme Presenting with Progressive Neurological Deficits: A Case Report

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Abstract

Background
Glioblastoma multiforme (GBM) is the most frequent aggressive brain tumor, characterized by rapid growth and invasive behavior, resulting in poor prognosis despite aggressive treatment. This report describes a patient with progressive neurological deficits suggestive of GBM.

Case Summary
A 60-year-old male presented with a 12-day history of progressive right lower limb weakness, accompanied by heaviness and numbness, leading to gait disturbance and inability to walk within one week. The weakness progressed to involve the upper extremities and slurred speech, causing dependence in daily activities. There was no history of seizures, headache, visual disturbance, stroke, or hypertension. The patient reported increased drowsiness, and chronic smoking.

Patient received corticosteroids and neuroprotective agents. Blood pressure was 144/56 mmHg. Cranial nerve examination revealed no abnormalities. Motor strength was graded 2222/5555 in both upper and lower extremities. Glasgow Coma Scale was E4M5V2. Cranial CT revealed a 1.13 cm midline shift and an irregular, inhomogeneous, hypodense intra-axial mass with necrotic components measuring 3.3 × 3.0 × 3.6 cm in the left frontal subcortical region with surrounding vasogenic edema, suggestive of high-grade glioma. Surgical intervention was recommended but declined.

Discussion
GBM presents with progressive focal neurological deficits due to mass effect and tumor infiltration. Contralateral motor weakness and speech disturbance corresponded to left frontal lobe involvement. CT findings supported suspicion of a high-grade intracranial tumor.

Conclusion
GBM should be considered in progressive focal neurological deficits. Clinical and CT findings may strongly suggest GBM, although histopathological confirmation remains required.

Keywords: Glioblastoma Multiforme, High-grade glioma, Progressive neurological deficit

ID_47 Case Report / Neurophysiology (Epilepsy)

Hyperkinetic Seizures with Impaired Consciousness in a Frontal Lobe Epilepsy Patient - A Case Report

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Abstract

Background

Frontal lobe epilepsy (FLE) is one of the most common types of focal epilepsies, characterized by a heterogeneous spectrum of motor and non-motor semiologies. Hyperkinetic seizures are one such manifestation of FLE, occurring with preserved or impaired awareness. These symptoms are often mistaken as non-epileptic events, thus making accurate diagnosis challenging.

Case Summary

A 29-year-old female presented with recurrent episodes of uncontrolled hyperkinetic movements involving the right arm and leg, accompanied by tremulous perioral movements, and preceded by headache and vertigo-like dizziness. Seizure frequency increased during the first 24 hours of admission, with the patient's consciousness fluctuating throughout ictal periods. Video electroencephalography (vEEG) performed during hospitalization revealed interictal spike-and-wave discharges over the left frontal region. After hyperventilation, generalized ictal activity was observed, accompanied clinically by status epilepticus lasting approximately eight minutes. Intravenous phenytoin was administered and continued as oral maintenance, and seizure control was finally obtained with subsequent clinical improvement.

Discussion

Hyperkinetic seizures are a recognized manifestation of FLE and are often characterized by sudden vigorous motor activity. The frontal origin of seizures can lead to rapid propagation, producing generalized ictal patterns on EEG. Frontal spike-and-wave activity, particularly during activation procedures such as hyperventilation, supports the diagnosis. Early recognition is essential because appropriate antiepileptic therapy can effectively control seizure recurrence and prevent complications.

Conclusion

The case highlights the importance of considering FLE in patients presenting with hyperkinetic seizures and impaired consciousness. EEG findings, especially frontal spike-and-wave discharge, play a crucial role in confirming the diagnosis and guiding appropriate treatment.

Keywords: Frontal lobe epilepsy, hyperkinetic seizure, focal epilepsy

ID_48 Research / Neuro-Oncology

Association Between Serum Lactate Levels and Karnofsky Performance Status in Patients with Primary Intracranial Tumors: A Cross-Sectional Study

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Abstract

Background

Tumor cells exhibit uncontrolled proliferation accompanied by metabolic reprogramming characterized by increased aerobic glycolysis. The consequence of the Warburg effect, lactate becomes the predominant metabolic byproduct in brain tumor cells. Understanding tumor metabolic characteristics and patient's functional status are important for diagnosis, prognostic evaluation, and therapeutic planning.

Method

A cross-sectional study was conducted involving 32 patients diagnosed with primary intracranial tumors at Adam Malik General Hospital, Medan, who met the inclusion and exclusion criteria. Demographic data, serum lactate levels, and The Karnofsky Performance Status (KPS) scale were collected from all participants. Statistical analysis was performed using SPSS software, and evaluated using the Spearman rank correlation test.

Results

Among the 32 patients included in the study, meningioma was the most common primary intracranial tumor (46.9%). The median KPS score was 70 (range 40–90), while the median serum lactate level was 2.4 mmol/L (range 1.41–6.66 mmol/L). Spearman correlation analysis showed no statistically significant correlation between serum lactate levels and KPS scores ($p = 0.195$).

Discussion

Elevated serum lactate levels do not reflect poorer functional status (KPS score). The functional status of patients with primary intracranial tumors may be influenced by multiple factors, including tumor grade, location, and size.

Conclusion

There was no significant correlation between serum lactate levels and KPS scores in patients with primary intracranial tumors. These findings suggest that serum lactate alone may not serve as a reliable indicator of patient's functional status.

Keywords: Brain tumor metabolism; Karnofsky Performance Status; Primary intracranial tumor; Serum lactate; Warburg effect.

ID_49 Case Report / Neuro-Vascular

Altered Consciousness Mimicking Sleep in a Young Adult with Communication Barriers and Subarachnoid Hemorrhage: a challenging case in rural area

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Abstract

Background

Subarachnoid hemorrhage (SAH) in young adults is an uncommon but life-threatening neurological emergency. In patients with communication barriers, altered consciousness may mimic physiological sleep, leading to delaying recognition.

Case Summary

A 29-year-old male with congenital hearing and speech impairment was found unresponsive for more than 24 hours. Due to a lack of awareness of stroke symptoms, his family presumed he was sleeping. Communication barriers masked the initial thunderclap headache. Upon awakening, he exhibited vomiting, photophobia, diplopia, meningeal signs, and bilateral abducens palsy. Head computed tomography (CT) showed acute SAH in the suprasellar and ambient cisterns. CT angiography revealed no aneurysm but a non-visualized left transverse sinus. Managed conservatively, his deficits resolved completely.

Discussion

The significant diagnostic delay resulted both the family's lack of stroke awareness and the patient's communication limitations. However, the patient recovered fully. This clinical course is consistent with perimesencephalic SAH. Hemorrhage confined to the suprasellar and ambient cisterns, along with the non-visualized transverse sinus, suggested a venous rather than arterial source of bleeding. This benign, non-aneurysmal pathophysiology likely explains the excellent neurological outcome despite the prolonged delay in hospital admission.

Conclusion

Communication barriers and lack of stroke awareness significantly delay SAH recognition. Identifying the perimesencephalic pattern and its venous origin explains the favorable prognosis despite delayed medical intervention.

Keywords: Subarachnoid Hemorrhage; Perimesencephalic; Hearing dan Speech Impairment; Delayed Diagnosis.

ID_50 Research / Neuro-Vascular

Added Diagnostic Value of Routine CT Angiography in Code Stroke Protocol: Early Experience from a Tertiary Stroke Center

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Abstract

Background
Non-contrast CT is the standard initial imaging in acute stroke but provides limited information regarding vascular pathology. Integrating CT angiography (CTA) into the code stroke algorithm enables rapid identification of large vessel occlusion (LVO) and other vascular abnormalities that may influence acute management and secondary prevention strategies.

Method
We retrospectively analyzed patients evaluated under the code stroke protocol within a 24-hour onset window at Sardjito Hospital in December 2025. Demographic and clinical severity data were examined in relation to CT angiography (CTA) findings to determine the prevalence of LVO, intracranial stenosis, and other vascular abnormalities.

Results
A total of 77 patients activated the code stroke protocol (mean age 62.6 years; 54.5% female). CTA identified LVO in 4 patients (5.2%), enabling potential triage for mechanical thrombectomy. Intracranial stenosis was detected in 44 patients (57.1%), including 22 with isolated stenosis; among them, 14 patients presented with NIHSS ≥4. Additionally, CTA identified unruptured aneurysms in 6 patients (7.8%) of those presenting with hemorrhagic stroke.

Discussion
Routine CTA revealed a substantial burden of underlying vascular disease, including intracranial stenosis and aneurysms. These findings highlight the value of CTA not only for LVO detection but also for identifying vascular abnormalities that may influence acute treatment decisions and long-term stroke prevention strategies.

Conclusion
Routine CTA in the code stroke protocol provides rapid LVO detection while simultaneously identifying clinically relevant vascular abnormalities. This integrated approach may improve acute treatment triage and inform secondary stroke prevention strategies.

Keywords: Acute stroke, Cerebral tomography angiography, Code stroke, Stroke imaging

ID_51 Case Report / Neuro-Infection

Hydrophobia as a Clinical Manifestation of Rabies Encephalitis: Major Neglected Tropical Disease, A Case Report

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Abstract

Background
Rabies is an acute viral encephalitis primarily transmitted through bites from infected animals, particularly dogs. Clinically, rabies presents as paralytic or furious forms, with hydrophobia—a pathognomonic sign of the furious type—indicating brainstem and limbic involvement.

Case Summary
A 23-years-old man presented with a six-hour history of hydrophobia. He complain of refused to drink or bathe because exposure to water triggered dyspnea, difficulty of swallowing, fear of wind and hypersalivation. Three weeks prior, he had sustained a dog bite on the left crural region and did not receive post-exposure prophylaxis. The wound had healed at presentation. He was fully conscious, with blood pressure 144/93 mmHg, normal pulse rate, and temperature 37°C. Neurological examination showed no focal deficits. Laboratory findings revealed marked leukocytosis (36.78 × 10/L), neutrophilia, hypernatremia (154 mmol/L), and elevated blood urea nitrogen and creatinine levels. A clinical diagnosis of hydrophobia secondary to suspected rabies was made.

Discussion
Hydrophobia results from reflex spasms of the pharyngeal and laryngeal muscles triggered by liquid stimuli, secondary to brainstem neuronal dysfunction. The mortality approaches 100%; therefore, immediate post-exposure vaccination and administration of rabies immunoglobulin are essential. The patient received intensive supportive management and symptomatic sedation.

Conclusion
This case emphasizes hydrophobia as a hallmark of advanced rabies encephalitis and highlights the critical role of timely post-exposure prophylaxis and handling rabies bite cases in preventing fatal outcomes.

Keywords: Rabies encephalitis, hydrophobia

ID_52 Case Report / Neuro-Oncology

Symptomatic Epilepsy with Brain Tumor Carcinoma Metastase Mimicking Multiple Cerebral Abscesses : A Case Report

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Abstract

Background
Symptomatic epilepsy occurs in approximately 35% of patients with brain tumors and may represent the initial clinical manifestation. Intracranial tumors can mimic cerebral abscesses both clinically and radiologically because of overlapping neurological symptoms and imaging features, creating diagnostic challenges and potentially delaying appropriate management.

Case Summary
A 40-year-old male presented with recurrent seizures accompanied by vomiting, blurred vision, and persistent headache for six months. The patient also had a history of untreated dental caries for three years. On physical examination, he was fully conscious with a Glasgow Coma Scale score of E4V5M6. Blood pressure was 142/90 mmHg and other vital signs were within normal limits. Contrast-enhanced magnetic resonance imaging revealed multiple lesions in the right parieto-occipital lobe suggestive of cerebral abscesses. Electroencephalography demonstrated slowing waves in the right temporal and occipital regions. However, anatomical pathology examination revealed metastatic carcinoma with chronic suppurative inflammation. Immunohistochemical staining showed positivity for CK7 and TTF-1, confirming intracranial metastatic carcinoma. The final diagnosis was metastatic brain tumor mimicking multiple cerebral abscesses.

Discussion
Symptomatic epilepsy in brain tumor patients may result from neuroinflammation, disruption of neuronal networks, and imbalance of excitatory and inhibitory neurotransmitters. Because brain tumors may resemble cerebral abscesses on imaging, histopathological evaluation is often necessary to establish a definitive diagnosis.

Conclusion
Metastatic brain tumors should be considered an important differential diagnosis in patients with suspected cerebral abscess presenting with seizures. Early recognition and prompt management are essential to improve neurological outcomes.

Keywords: Brain tumor, cerebral abscess, epilepsy.

ID_53 Research / Pain and Headache

Exploring The Effectivity of Kinetic Oscillation Stimulation as a Novel Neuromodulation Therapy for Migraine : A Systematic Review

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Abstract

Background
Migraine is a major cause of disability-adjusted life years (DALYs) in neurological disorders. Despite the appropriate pharmacological treatment given, some patients still experience migraine attacks. Therefore, providing alternative options is necessary. Non-invasive neuromodulation is a treatment that is believed to be effective in reducing recurrence and pain severity. Kinetic oscillation stimulation (KOS) is one of the neuromodulations that has been studied. This study aims to explore the effectiveness of KOS as a neuromodulation therapy for migraine.

Method
A systematic review following PRISMA guidelines was conducted through PubMed, the Cochrane Library, and MedRxiv databases to identify randomized controlled trials (RCTs) that investigate KOS therapy for migraine. The quality assessment and risk-of-bias evaluation were performed using Cochrane ROB 2.0.

Results
Three RCTs met the inclusion criteria, including 284 patients of male and female patients aged 18–65 years old diagnosed with migraine, examined with KOS within 3–60 days. All the studies reported that KOS was beneficial in reducing pain severity.

Discussion
KOS is a minimally invasive nasal treatment that is believed to reduce pain by modulating the trigemino-autonomic reflex. The studies found that KOS is effective in reducing pain immediately. However, there were side effects reported, such as dizziness, epistaxis, and rhinorrhea.

Conclusion
KOS has been reported to improve pain intensity. Future research is needed to explore the potential of KOS as migraine therapy with a longer follow-up duration and larger subjects.

Keywords: Migraine, kinetic oscillation stimulation, neuromodulation, recurrence, pain reduction

ID_54 Case Report /
Neuro-Ophthalmology & Neuro-Otology

Risk of Recurrent Benign Paroxysmal Positional Vertigo due to Proton Pump Inhibitors Consumption: An Evidence-Based Case Report

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Abstract

Background

Proton pump inhibitors (PPI) are the most commonly prescribed potentially inappropriate medication category among older adults. However, limited research has been carried out on the relationship between PPI and the recurrence of benign paroxysmal positional vertigo (BPPV). This report aimed to identify whether the recurrence of BPPV can be caused by PPI consumption.

Case Summary

A 71-year-old woman with pre-existing hypertension experienced a sudden spinning sensation, especially whenever the patient moved her head and changed her position, followed by nausea and a positive Dix-Hallpike maneuver. Previously, the patient had experienced similar symptoms about a year ago. Three days ago, the patient suffered from epigastric pain and was treated with Omeprazole 20 mg and Lansoprazole 30 mg twice a day for 3 days ahead.

Discussion

A literature search was performed in PubMed, SCOPUS, and EBSCOHost. Relevant studies were identified, screened through Rayyan, and critically appraised using the Oxford Critical Appraisal Tools. Two studies involving 172.920 subjects were included. Subjects aged less than 65 years old or more than equal to 65 years old, with one or fewer comorbidities or more than one comorbidity, who had PPI intake are at increased risk of having recurrent BPPV. Furthermore, subjects who were prescribed PPI within 30 days or between 31 and 365 days were also at risk. Moreover, the longer dates of PPI use, the higher risk of having recurrent BPPV.

Conclusion

PPI consumption is a risk factor for recurrent BPPV.

Keywords: Proton pump inhibitors, Benign paroxysmal positional vertigo

ID_57 Research / Neuro-Vascular

CHARACTERISTICS OF ACUTE STROKE PATIENTS RECEIVING THROMBOLYSIS THERAPY AT BULELENG REGENCY HOSPITAL IN 2025

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Abstract

Background

Ischemic stroke is a neurological disease that is the leading cause of disability and death worldwide. Intravenous thrombolysis therapy in the acute phase has been proven effective in improving neurological outcomes when administered within the appropriate time window.

Method

This study is a retrospective descriptive study using secondary data. The study population consisted of all patients with acute ischemic stroke who received intravenous thrombolysis therapy. The variables studied included age, gender, symptom onset, NIHSS scores before and after therapy, and post-thrombolysis complications.

Results

This study aimed to determine the characteristics of acute ischemic stroke patients who received thrombolysis therapy at Buleleng District Hospital in 2025. This study obtained 41 data samples, which are presented in numbers and percentages for each category.

Discussion

Based on an analysis of 41 patients, the majority of whom were elderly and male. Most patients arrived at the hospital within less than 2 hours, thus falling within the optimal time window for thrombolytic therapy. The severity of stroke prior to therapy was predominantly moderate, which is an ideal candidate for thrombolytic therapy. After therapy, approximately 66% of patients showed clinical improvement based on a decrease in NIHSS scores. Post-thrombolysis complications were relatively low.

Conclusion

This study has limitations because it uses a descriptive design and a relatively small amount of data, as well as retrospective data collection from medical records without a control group, so it cannot assess causal relationships or the comparative effectiveness of therapy and may introduce information bias.

Keywords: Ischemic Stroke, Thrombolysis Therapy, NIHSS

ID_59 Research / Neuro-Behavior

Perivascular Diffusion Tensor Imaging Reveals Glymphatic Dysfunction in Alzheimer's Disease: A Network Meta-Analysis

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Abstract

Background

The glymphatic system clears brain waste including amyloid- (A), implicated in Alzheimer's disease (AD). This study evaluated glymphatic dysfunction in mild cognitive impairment (MCI) and AD using the diffusion tensor imaging analysis along the perivascular space (DTI-ALPS) index.

Method

A systematic search of PubMed, Scopus, and Web of Science was conducted up to February 2026. Studies including patients with Alzheimer's disease without major comorbidities were eligible. Random-effects meta-analysis evaluated differences in the ALPS index.

Results

A meta-analysis of 29 studies including a total of 5,827 patients showed significant DTI-ALPS differences, with higher indices in healthy control (HC)and MCI than AD (0.16 [0.13–0.19] and 0.08 [0.05–0.12]). SUCRA ranked HC highest (100%), followed by MCI (50%) and AD (0%). Meta-regression identified several moderators of ALPS differences, including age, cognitive scores (Mini-Mental State Examination [MMSE], Montreal Cognitive Assessment [MoCA]), Clinical Dementia Rating [CDR], Grey Matter Volume Fraction [GMVF], APOE 4 status, and p-tau levels. A42 was also a significant moderator in the HC–AD comparison (p = 0.0332), but not in MCI–AD (p = 0.0746).

Discussion

Our findings support glymphatic dysfunction across the AD continuum, with ALPS highest in HC and lowest in AD. Age, cognition, clinical severity, GMVF, APOE 4, and p-tau moderated these differences; ALPS inversely correlated with A42, consistent with previous evidence.

Conclusion

These findings further support the utility of the ALPS index for detecting altered cerebral interstitial fluid dynamics in MCI and AD. However, heterogeneity in ALPS measurements and variability across studies should be considered.

Keywords: alzheimer's disease, glymphatic, perivascular space

ID_60 Case Report / Neurophysiology (Epilepsy)

The Great Mimicker in the Emergency Department: A Case Report of Psychogenic Non-Epileptic Status Epilepticus Following Antidepressant Discontinuation

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Abstract

Background

Psychogenic non-epileptic seizures (PNES) are paroxysmal events that clinically resemble epileptic seizures but lack electroencephalographic (EEG) epileptiform activity. In emergency setting, PNES can manifest as "pseudo-status epilepticus," creating diagnostic challenges and potential iatrogenic risks.

Case Summary

A 27-year-old woman presented to the Emergency Department with five days of recurrent seizure-like episodes, escalating to 10 events within 30 minutes, mimicking status epilepticus. The episodes were characterized by generalized jerking with preserved awareness and full recall. Her history was notable for major depressive disorder with recent abrupt antidepressant discontinuation. Brain Computed Tomography (CT) and interictal EEG were unremarkable. Phenytoin (10 mg/kg) was initially administered for seizure control but was discontinued after PNES were diagnosed following psychiatric consultation. The patient improved after multidisciplinary psychiatric management.

Discussion

PNES may closely mimic refractory status epilepticus, particularly during acute stress or medication withdrawal. Recognition of key semiologic features, including preserved awareness, helps avoid unnecessary intubation and antiepileptic escalation. Psychiatric consultation followed by antidepressant medication and cognitive-behavioral therapy resulted in marked clinical improvement.

Conclusion

Early recognition of psychogenic status epilepticus is crucial to avoid diagnostic pitfalls and unnecessary medication, while ensuring timely psychiatric referral for therapies such as cognitive-behavioral therapy.

Keywords: Psychogenic non-epileptic seizures, status epilepticus, antidepressant discontinuation

ID_61 Case Report / Neuro-Infection

HIV-Associated Cerebral Vasculitis Presenting as First-Onset Seizure in a Young Adult

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Abstract

Background

New-onset seizure occurs about 21% of people living with Human Immunodeficiency Virus (HIV) with neurological complications. HIV-associated cerebral vasculitis is a rare but potentially underdiagnosed cause of multifocal ischemic brain lesions and seizures. This study aims to report a HIV-associated cerebral vasculitis presenting as first onset seizure in a young adult.

Case Summary

A 30-year-old man presented with a first-onset generalized tonic-clonic seizure occurring approximately 1.5 hours prior to hospital admission. The seizure lasted for about two minutes and resolved spontaneously. The patient had been diagnosed with HIV infection 10 months earlier and was on antiretroviral therapy consisting of Tenofovir, Lamivudine, and Dolutegravir. Postictal neurological examination revealed no focal deficits. Initial laboratory tests showed a complete blood count within normal limits and hypokalemia. Anti-Toxoplasma IgG was positive, and the calcium level was within normal limits. Brain computed tomography (CT) scan non contrast showed subacute ischemic cerebral infarction with suspected perifocal edema in the left parietal lobe, chronic ischemic cerebral infarction suggestive of vasculitis involving the left caudate nucleus and bilateral basal ganglia, as well as minimal intracerebral hemorrhage with differential diagnosis of prominent vascular structures in the right occipital lobe.

Discussion

Seizures often arise from opportunistic infections, toxoplasmosis, metabolic problems, or negative reactions to medications in patients with HIV. Conversely, cerebrovascular complications, such as HIV-associated vasculopathy and vasculitis, constitute less prevalent yet significant causes.

Conclusion

This case highlights the importance of considering HIV-associated cerebral vasculitis as a possible cause of seizures that appear for the first time.

Keywords: cerebral vasculitis, first-onset seizure, HIV infection, HIV-associated vasculopathy, multifocal ischemic stroke

ID_62 Case Report / Neuro-Immunology

Diagnostic Challenge of Acute Encephalitis with Neuropsychiatric Symptoms and Negative Anti-NMDA Receptor Antibody: A Case Report

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Abstract

Background

Encephalitis is characterized by inflammation of the brain parenchyma and may result from infectious or autoimmune processes. Viral infections remain the most common cause of encephalitis. However, autoimmune encephalitis, particularly anti-N-methyl-D-aspartate receptor (anti-NMDAR) encephalitis, has increasingly been recognized in young patients. Because clinical manifestations often overlap with viral encephalitis, diagnosis can be challenging, especially when neuronal antibody testing is negative.

Case Summary

A 19-year-old male presented with decreased consciousness following a generalized seizure preceded by incoherent speech. Eleven days before admission, he experienced intermittent fever and diarrhea. On arrival, he was agitated with a Glasgow Coma Scale (GCS) score of 10 without focal neurological deficits. During hospitalization, the patient reported visual and auditory hallucinations. Brain CT and contrast-enhanced MRI were unremarkable. Cerebrospinal fluid (CSF) analysis revealed pleocytosis. HSV PCR and MTB testing were negative, and anti-NMDAR antibody testing in CSF was also negative. Electroencephalography (EEG) showed abnormal activity. The patient recovered consciousness to a GCS score of 15 by the twelfth day of hospitalization.

Discussion

The presence of fever, seizure, and CSF pleocytosis suggested viral encephalitis. However, negative infectious studies, normal neuroimaging, and neuropsychiatric symptoms raised suspicion for autoimmune encephalitis. Despite negative anti-NMDAR antibody results, the clinical features and favorable response to immunotherapy supported the diagnosis of probable autoimmune encephalitis.

Conclusion

Autoimmune encephalitis presenting as acute encephalitis with neuropsychiatric symptoms despite negative anti–NMDAR antibody results can be challenging. Early initiation of immunotherapy is essential to improve clinical outcomes. Testing for other neuronal antibodies may be required to confirm the underlying autoimmune etiology.

Keywords: Autoimmune encephalitis; Anti-NMDA receptor encephalitis; Viral encephalitis; Neuropsychiatric symptoms

ID_64 Research / Movement Disorder

Cerebrospinal fluid and blood-based NfL and GFAP in Multiple System Atrophy: A Meta-Analysis

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Abstract

Background

Multiple System Atrophy (MSA) is a rare, rapidly progressive disease that often overlaps with other synucleinopathies. Reliable biomarkers are needed to facilitate early diagnosis. Neurofilament light chain (NfL) and glial fibrillary acid proteins (GFAP) are markers of neuroaxonal injury and astroglial activation, we aimed to synthesize available data on the utility of NfL and GFAP.

Method

A systematic search of PubMed, Proquest, Lancet, Wiley, and EbscoHost was conducted to identify observational studies evaluating NfL and GFAP in MSA versus other synucleinopathies. Meta-analyses were performed when ≥2 comparisons were available. Effect sizes were presented as standardized mean difference (SMD). Risk of bias was assessed with the Newcastle-Ottawa scale.

Results

Across 28 included studies, cerebrospinal fluid NfL was significantly higher in MSA than Parkinson's disease (PD; SMD 1.90), progressive supranuclear palsy (PSP; SMD 0.61), Parkinson's disease with dementia (PDD; SMD 1.31), dementia with Lewy Bodies (DLB; SMD 1.00) and corticobasal syndrome (CBS; SMD 0.31). Plasma NfL was elevated versus PD (SMD 2.10). CSF GFAP differentiated MSA from PD (SMD 0.45) and CBS (SMD -0.85) but not DLB or PSP.

Discussion

NfL and GFAP were selected due to their relevance to MSA pathophysiology. Compared to plasma and serum, CSF measurements had more significant effect sizes across multiple disease groups. Compared to GFAP, NfL had more significant effect sizes across multiple disease groups as NfL reflects neuroaxonal injury whereas GFAP reflects astrocytic activation, a secondary process.

Conclusion

NfL and GFAP has potential clinical utility in the diagnosis of MSA.

Keywords: Multiple system atrophy, NfL, GFAP, synucleionopathies, atypical parkinson

ID_65 Case Report / Neuro-Trauma

Acute Traumatic Paraplegia in A Young Adult: A Case Report of Spinal Cord Injury

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Abstract

Background

Traumatic spinal cord injury (tSCI) is a neurological emergency that can lead to permanent motor, sensory, and autonomic dysfunction. Early diagnosis and timely management are essential to prevent secondary spinal cord damage and improve clinical outcomes. This case report describes acute paraplegia in a young adult following thoracolumbar trauma.

Case Summary

Based on clinical and imaging findings, the patient was diagnosed with traumatic spinal cord injury classified as American Spinal Injury Association (ASIA) Impairment Scale Grade A. Initial management included spinal immobilization, intravenous fluids, analgesics, methylprednisolone therapy, and urinary catheterization. Surgical decompression and stabilization were recommended; however, the patient declined operative intervention.

Discussion

A 22-year-old male presented to the emergency department with sudden paralysis of both lower extremities accompanied by loss of sensation below the umbilical level after being struck on the back by heavy industrial equipment at his workplace. Neurological examination revealed flaccid paraplegia with motor strength of 0/0 in both lower limbs and complete sensory loss beginning at the T11 dermatome. Imaging evaluation demonstrated a compression fracture of the L1 vertebral body with narrowing of the intervertebral discs at T12–L1 and L1–L2, resulting in spinal cord compression.

Conclusion

This case highlights the importance of early recognition, accurate neurological classification, and multidisciplinary management in traumatic spinal cord injury to optimize clinical outcomes.

Keywords: traumatic spinal cord injury, paraplegia, thoracolumbar compression, ASIA

ID_66 Research / Pain and Headache

Vascular and Neurohormonal Modulators for Migraine Prophylaxis: A Systematic Review of Randomized Controlled Trials Evaluating Statins, Vitamin D, and Melatonin.

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Abstract

Background
Migraine is a common neurovascular disorder involving endothelial dysfunction, neurogenic inflammation, and neurohormonal dysregulation. Statins, vitamin D, and melatonin have been proposed as preventive therapies due to their vascular, immunomodulatory, and circadian regulatory effects. This systematic review aimed to evaluate the effectiveness of these agents in migraine prevention.

Method
This systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement. Literature searches were performed in PubMed, ScienceDirect, Wiley, and Cochrane databases. Randomized controlled trials evaluating statins, vitamin D, or melatonin for migraine prophylaxis were included. Study quality was assessed using the Cochrane risk-of-bias tool for randomized trials (RoB 2).

Results
Eleven trials involving 890 participants were included, comprising three statin trials, three vitamin D trials, four melatonin trials, and one combined statin–vitamin D trial. Most studies were small and predominantly enrolled female participants. Statin trials generally reported reductions in migraine frequency when used as adjunctive therapy. Vitamin D trials demonstrated modest reductions in headache frequency, particularly among participants with low baseline levels. Melatonin trials reported improvements in migraine days and sleep-related outcomes compared with placebo.

Discussion
These findings may reflect the vascular, inflammatory, and circadian mechanisms involved in migraine pathophysiology. However, heterogeneity in dosage, treatment duration, and baseline characteristics across studies may explain variability in outcomes.

Conclusion
Statins, vitamin D, and melatonin may provide modest benefit for migraine prophylaxis, although larger and well-designed randomized trials are needed to confirm their effectiveness.

Keywords: Melatonin, Migraine, Statins, Vitamin D

ID_67 Research / Neuro-Vascular

Occlusion and Beyond: The Accuracy of Deep Learning in Detecting Large Vessel Occlusion on Non-Contrast Computed Tomography—A Systematic Review and Meta-Analysis

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Abstract

Background
Delayed identification of large vessel occlusion (LVO) in acute ischemic stroke (AIS) worsens outcomes. Despite CT angiography (CTA) becoming the gold standard, non-contrast CT (NCCT) remains the most accessible initial modality worldwide. Deep learning (DL) shows potential for LVO detection on NCCT, but reported performance is variable and lacks a quantitative synthesis. This study aims to determine the pooled performance of DL models for LVO detection on NCCT.

Method
A systematic search of PubMed, Scopus, ScienceDirect, Taylor & Francis, and EBSCO was conducted through January 2026 following PRISMA guidelines. Eligible studies included suspected AIS patients, applied DL to NCCT for LVO detection, used CTA or MRI/MRA as the reference standard, and reported diagnostic accuracy metrics. Risk of bias was assessed using QUADAS-2. A random-effects meta-analysis was performed.

Results
Nine studies involving 3,879 patients were included. Five studies underwent quantitative synthesis. The pooled AUC was 0.88 (95% CI, 0.77–0.94). Pooled sensitivity and specificity were 0.80 (95% CI, 0.68–0.89) and 0.86 (95% CI, 0.74–0.93), respectively. Four additional studies without confidence intervals showed median sensitivity of 82.75% (IQR 73.85–83.05%) and specificity of 85.25% (IQR 76.05–94.25%).

Discussion
DL shows promising performance for detecting LVO on NCCT and may support early stroke triage when CTA is unavailable. However, substantial heterogeneity, methodological variability, and a predominantly high risk of bias across studies highlight the need for standardized validation and prospective real-world studies.

Conclusion
DL demonstrates robust diagnostic performance for LVO detection on NCCT.

Keywords: acute ischemic stroke, large vessel occlusion, deep learning, non-contrast computed tomography, diagnostic accuracy

ID_68 Case Report / Neuro-Infection

Case Series: Enterobacteriaceae Ventriculitis After VP Shunt Caused by Klebsiella pneumoniae vs Citrobacter koseri: Comparison of Treatment Effectiveness and Clinical Outcomes

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Abstract

Background

The selection of antibiotics in ventriculitis remains challenging. Different etiologies may lead to different therapeutic approaches and clinical outcomes.

Case Summary

A 49-year-old male with K. pneumoniae ventriculitis received intravenous meropenem (14 days) plus intrathecal gentamicin (8 days), complicated by hydrocephalus and declining consciousness without any meaningful improvement of CSF analysis. Compared with 51-year-old male with C. koseri ventriculitis was treated with intravenous amikacin and levofloxacin (7 days) showed clinical recovery, and meaningful improvement of CSF analysis.

Discussion

The recommended antibiotics for ventriculitis caused by K. pneumoniae are meropenem and intrathecal gentamicin, as the pathogen often produces extended-spectrum beta-lactamase (ESBL). In contrast, C. koseri remains sensitive to amikacin and levofloxacin. Clinical outcomes in ventriculitis caused by K. pneumoniae tend to be worse due to complex biofilm-forming mechanisms on ventriculoperitoneal (VP) shunt. This biofilm formation block antibiotics from achieving therapeutic concentrations in the cerebrospinal fluid, thereby increase inflammatory responses and leads to complications such as hydrocephalus. In contrast, C. koseri infections generally has better prognosis due to lower resistance rates. The minimal inhibitory concentration (MIC) required for intravenous antibiotics in C. koseri is lower than K. pneumoniae, resulting in broader therapeutic effectiveness and lower need for dose or frequency escalation to achieve therapeutic level. CSF analysis after 7 days treatment showed that K.pneumonia tends to be persistent showing the inflamation response than C.koseri.

Conclusion

C. koseri ventriculitis carries a more favorable therapeutic response and prognosis than K. pneumoniae, reflecting differences in resistance mechanisms, biofilm virulence, and antibiotic pharmacodynamics.

Keywords: Klebsiella pneumoniae, Citrobacter koseri, Ventriculitis

ID_69 Case Report / Neuro-Infection

Cerebral Disorder in Patients with Multiple Tuberculoma

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Abstract

Background
Cerebral tuberculoma is a serious form of Tubercolosis (TB) due to the hematogenous spread of Mycobacterium tuberculosis(MT). Central nervous system (CNS) TB accounts for 1.3% of all tuberculosis cases and 6.3% of extrapulmonary TB cases. Anti-TB drugs are important for the success of cerebral tuberculoma treatment but there are some challenges in establishing a diagnosis of cerebral tuberculoma.

Case Summary
A 24-year old woman came to RSUD Cibabat with complaints of headache, dizziness, frequent numbness in the feet and blurry vision. Ct-Scan with contrast result showed of multiple tuberculoma. Patient given anti-tuberculosis drugs and corticosteroid therapy. Patient symptoms such as headache and dizziness were reduced after couple months of treatment.

Discussion
Cerebral tuberculoma is a mass of granulomatous tissue that develops due to hematogenous spread of tuberculosis infection. The clinical manifestations are non-specific, such as headaches, seizures. vomiting, and intracranial hypertension. The minimum duration of therapy for cerebral tuberculoma is 12 months. Furthermore, the degree of clinical improvement depends on the size of the tuberculoma lesion.

Conclusion
Cerebral tuberculoma can be treated with antituberculosis drugs, at least 12 months of treatment. A thorough clinical examination, laboratory tests, and neuroimaging help to establish an accurate diagnosis especially patient with early onset to improve quality of life.

Keywords: Tuberculoma, Tuberculosis, Cerebral

ID_70 Case Report / Neuro-Behavior

Acute Psychosis as Side Effect of Levetiracetam

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Abstract

Background
Epilepsy is a common neurological disorder primarily managed with antiepileptic drugs (AEDs). Levetiracetam, a second-generation broad-spectrum AED, is widely used because of its favorable pharmacokinetic profile and minimal drug–drug interactions. However, psychiatric adverse effects, including psychosis, although rare, have been reported.

Case Summary
A 60-year-old man diagnosed with Epilepsy Partialis Continua (EPC), characterized by continuous involuntary movements of the left limbs without impaired consciousness. After discontinuation of phenytoin due to skin rash, levetiracetam was initiated with good seizure control. Neuroimaging revealed right frontal cortical dysplasia and electroencephalography showed epileptiform discharges in the corresponding region. Within two weeks of levetiracetam therapy, the patient developed acute psychotic episodes during rehospitalization.

Discussion
EPC is a rare focal motor seizure with continuous localized muscle contractions. EPC can be caused by vascular, infectious, neoplastic, metabolic, or structural brain abnormalities. Levetiracetam is a second-generation antiseizure drug widely used for refractory epilepsy. It works by binding to synaptic vesicle protein SV2A, reducing excitatory neurotransmitter release. The drug has high bioavailability, rapid absorption, and minimal CYP450 metabolism. Common adverse effects are neurobehavioral symptoms such as irritability, agitation, and mood changes. Psychosis occurs in ~1–3% of patients, presenting with hallucinations, delusions, or behavioral disturbances. Psychiatric symptoms are usually reversible after levetiracetam discontinuation.

Conclusion
Although levetiracetam is generally safe and effective, but clinicians should be aware of possible levetiracetam-induced psychosis and discontinue the drug if symptoms occur

Keywords: Epilepsy, Levetiracetam, Psychosis

ID_71 Research / Neuro-Restoration

Beyond Survival, Toward Cognitive Restoration: Artificial Intelligence for Cognitive Recovery in Stroke Rehabilitation — A Systematic Review

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Abstract

Background
Stroke is a leading cause of mortality and long-term disability, with cognitive impairment significantly affecting patients' quality of life (QoL). Meanwhile, artificial intelligence (AI)-based interventions are emerging as promising tools to enable more personalized cognitive rehabilitation. This study explores the potential of artificial intelligence (AI)–based interventions for cognitive recovery after stroke and evaluates the specific AI approaches associated with improved outcomes.

Method
Studies across PubMed, Scopus, and EBSCO databases over the years were screened following PRISMA guidelines. Original studies evaluating the use of AI, including ML or CT as tools for cognitive recovery in stroke patients, were retrieved. The risk of bias was assessed using the ROBINS-I tool. The data were extracted and reviewed systematically.

Results
Of the 238 studies screened, four met the inclusion criteria. All included studies assessed baseline cognitive status and post-intervention cognitive improvement. Three studies reported that AI usage significantly improved cognitive assessment scores compared with conventional rehabilitation. Additionally, one study demonstrated comparable outcomes through a non-inferiority analysis between AI-based and conventional approaches. The AI-based modalities evaluated across studies included Power-Afa (Italy), Erica (Italy), Zenicog® (Korea), also Neuronation and Lumosity (India).

Discussion
Cognitive impairment affects patients' quality of life, making effective rehabilitation a key component of long-term stroke management. AI-based modalities potentially enhance rehabilitation by enabling adaptive training, continuous performance monitoring, and personalized cognitive exercises tailored to individual needs, which support more targeted and engaging strategies to address persistent post-stroke cognitive deficits.

Conclusion
AI may offer higher potential for future personalized therapy assistance, including cognitive recovery in stroke rehabilitation.

Keywords: stroke, artificial intelligence, cognitive recovery, cognitive rehabilitation

ID_72 Case Report / Pain and Headache

Exosome Therapy for Pain Modulation and Functional Improvement in Anterior Cruciate Ligament Rupture

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Abstract

Background

Anterior Cruciate Ligament (ACL) rupture commonly causes severe knee pain and functional disability. Surgery and conventional treatments may require a long recovery and not be preferred by all patients. Recently, exosome-based therapy has gained attention since they play a role in pain relief through intercellular communication. This case investigates the therapeutic role of exosomes in ACL rupture.

Case Summary

A 55-year-old woman reported left knee pain for six months following a slipping accident. The Numeric Rating Scale (NRS) score was 7. Pain intensified with walking and knee bending. On physical examination, her left knee demonstrated limited flexion. Magnetic Resonance Imaging showed a complete ACL tear, lateral meniscus tear, and grade II osteoarthritis. The patient declined surgery. We performed three monthly 5cc exosome injections into the ACL, lateral meniscus, and intra-articular under ultrasound guidance. At the one-month follow-up, she no longer felt pain, with an NRS score of 0-1. She remained pain-free at six months and had resumed exercise, although tears and osteophytes persisted on imaging.

Discussion

This case demonstrates that exosomes result in pain and functionality improvement, even in the presence of underlying structural defects. This is achieved presumably via their modulation of nociceptive and inflammatory pathways. Exosomes may serve as a non-surgical alternative for ACL rupture, as alleviating pain and improving function are as important as structural integrity.

Conclusion

Exosomes provide pain and functional improvement in ACL rupture, despite persistent structural abnormalities. This case highlights the potential of exosomes as a minimally invasive, pain-modulating therapy in ACL rupture.

Keywords: Exosomes, pain modulation, functional improvement, ACL rupture

ID_73 Case Report / Neuro-Immunology

Recurrent Acute Sensory Myelitis Manifestation of Double Negative Neuromyelitis Optica Spectrum Disorder in a Pediatric Onset Patient: A Case Report

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Abstract

Background

Neuromyelitis optica spectrum disorder (NMOSD) is an autoimmune inflammatory and demyelinating disorder associated with six clinical presentation linked to aquaporin-4 immunoglobulin G antibodies (AQP4-IgG). The absence of AQP4-IgG and serum myelin oligodendrocyte glycoprotein IgG (MOG-IgG), diagnose with double-negative NMOSD (dn-NMOSD). The demyelinating disorder can manifest motor, sensory and autonomic dysfuction with levels of severity. NMOSD is rarely occured in children. Thus, the diagnosis can be challenging but has important treatment implications.

Case Summary

A 16-year-old female presented with hyperalgesia, paresthesia, and tremor involving the chest and upper extremities, accompanied by a superior visual field deficit in the left eye. At the initial presentation, symptoms were predominantly sensory, with markedly increased deep tendon reflexes and quadriplegia. The patient had a prior diagnosis dn-NMOSD at the age 14 and was receiving mycophenolate sodium, azathioprine, and low-dose methylprednisolone. High-dose intravenous methylprednisolone (1g/day) was administered during the relapse, resulting in marked clinical improvement.

Discussion

NMOSD relapsing-remitting disease that rarely occur at childhood, commonly presents with longitudinally extensive transverse myelitis (LETM), defined as spinal cord lesions extending across ≥3 vertebral segments. Despite extensive cervical and thoracic involvement, this patient initially exhibited predominantly sensory symptoms with preserved motor strength, which differs from the typical presentation characterised by prominent motor deficit. During relapse, however, mild generalised motor weakness became evident.

Conclusion

This case demonstrates the pediatric onset of ds-negative NMOSD may initially present with predominantly sensory manifestations despite extensive LETM and subsequently evolve with mild motor involvement during relapse, highlighting the importance of early recognition and prompt immunosuppressive therapy.

Keywords: Neuromyelitis optical spectrum disorder; double negative NMOSD; Longitudinally extensive transverse myelitis; Spinal cord demyelination; Pediatric onset;

ID_74 Case Report /
Neurophysiology (Peripheral Nerve & Neuromuscular)

Reversible F-wave suppression in Endocrine-related Hypokalemia

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Abstract

Background
Hypokalemia is known to alter neuromuscular membrane excitability and produce reversible electrophysiological abnormalities on nerve conduction studies. Altough electrolyte disturbances are recognized causes these changes, neurophysiological manifestations associated with endocrine disturbances have been rarely described.

Case Summary
A 38 year-old woman presented with recurrent episodes of limb weakness over the past two years, consistent with hypokalemic periodic paralysis. She had underlying subclinical hyperthyroidism and cortisol deficiency. During an acute episode of weakness, serum potassium was markedly reduce. Nerve conduction studies showed preserved distal motor conduction, decrease CMAP amplitude, absent bilateral tibial F-wave but preserved H-reflexes, suggesting motor axonal hypoexcitability. In the same time, Electroencephalography (EEG) revealed generalized epileptiform discharges, indicating increase cortical excitability. After normalization of serum potassium, repeated nerve conduction studies showed restoration of Tibial F-wave and increased CMAP amplitudes. Bilateral Ulnar F-wave and long exercise test were normal.

Discussion
The transient absence of bilateral Tibial F-wave occurred without evidence of demyelination, axonal loss or radiculopathy, indicating reversible motor axonal hypoexcitability. In contrast, EEG findings suggested increase cortical hyperexcitability. Endocrine disturbances may contribute to electrolyte imbalance and neuronal membrane instability, potentially affecting both peripheral and central nervous system excitability.

Conclusion
Complete restoration of F-wave responses after normalization of serum potassium, strongly support a functional metabolic mechanisms rather than structural pathology. In contrast, EEG findings suggested concurrent cortical hyperexcitability, possibly influence by cortisol deficiency. Recognition of this reversible electrophysiologic changes is important to avoid misinterpretation as structural neuropathy and illustrated the differential sensitivity of central and peripheral neural tissue to systemic endocrine disturbances

Keywords: Hypokalemia periodic paralysis, cortisol deficiency, subclinical hyperthyroidism, F-wave, membrane excitability.

ID_75 Research / Neuro-Vascular

Dual Versus Single Antiplatelet Therapy in Secondary Prevention of Ischemic Stroke: A Bayesian Network Meta- Analysis.

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Abstract

Background

Recurrent ischemic stroke remains one of the leading causes of morbidity and mortality worldwide. Antiplatelet therapy is considered the main strategy for secondary prevention; however, the comparative effectiveness among different antiplatelet regimens is still unclear.

Method

A systematic search was conducted in PubMed, Scopus, and the Cochrane Library to identify randomized controlled trials assessing antiplatelet therapy for the secondary prevention of ischemic stroke. A Bayesian network meta-analysis was performed to evaluate and compare multiple treatment regimens.

Results

A total of 24 randomized controlled trials involving 89,107 patients were included in the analysis. The combination of cilostazol and aspirin showed the highest effectiveness in preventing recurrent ischemic stroke (SUCRA = 92.7%). Ticagrelor monotherapy ranked second (SUCRA = 75.3%), followed by ticagrelor combined with aspirin (SUCRA = 56.5%). Dual antiplatelet therapy demonstrated a tendency toward an increased risk of major bleeding, although the difference was not statistically significant (RR 1.23; 95% CI 0.95–1.60).

Discussion

Dual antiplatelet therapy may be more effective than single therapy in preventing recurrent ischemic stroke, although not all dual regimens showed superiority over monotherapy. However, safety analysis indicated that both major bleeding ($P = 0.0009$) and overall bleeding events ($P < 0.0001$) were significantly higher with dual therapy compared with monotherapy. No significant differences were observed among treatment groups regarding hemorrhagic stroke, intracranial hemorrhage, or gastrointestinal bleeding.

Conclusion

Cilostazol and aspirin appears to be the most effective regimen for the secondary prevention of recurrent ischemic stroke. Nevertheless, individualized antiplatelet therapy should be considered based on patient characteristics and clinical context.

Keywords: Ischemic stroke, Secondary prevention, Antiplatelet therapy, Dual antiplatelet therapy, Major Bleeding

ID_76 Case Report / Neuro-Infection

Tuberculous Meningitis as A Differential Diagnosis of Cerebral Vascular Disease in Geriatric Patients: A Case Report

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Abstract

Background

Tuberculous Meningitis (TBM) is an extrapulmonal tuberculosis complication with the most severe mortality rate. Delayed work up diagnosis and treatment, especially in geriatric patients, can lead to poor prognosis with impaired consciousness.

Case Summary

A 75-year-old male presented with an intense headache, myalgia, prone to choking, history of ischaemic stroke, and pulmonary tuberculosis with incomplete treatment. Neurological examination revealed positive babinski reflex, nuchal rigidity, and hemiplegia on the left side. Radiology imaging showed patchy consolidation and infiltration, non-contrast CT Scan showed a wide infarct with no bleeding or inflammation. The cerebrospinal fluid is clear with an elevated protein of 69 mg/dL. The patient showed great progress with a high dose steroid and 4FDC as an initial TB treatment plan.

Discussion

The nuchal rigidity is commonly found in subarachnoid hemorrhage (SAH) and TBM. The similarity is important to determine the differential diagnosis. Based on thwaites scoring, this patient's score is -3 (age>36 [2]; history of illness ≥6 days [-5]) indicating possible TBM. Based on the lancet scoring system, the score is 10 indicating possible TBM.

Conclusion

Patients with a prior tuberculosis diagnosis are prone to develop a complication, it's important to explore every differential diagnosis.

Keywords: Tuberculous Meningitis, Cerebrovascular Disease, Subarachnoid Hemorrhage, Geriatric

ID_77 Case Report / Neuro-Vascular

Recurrent Stroke in a Young Woman With Normal Digital Subtraction Angiography: Vascular Event or Mitochondrial Stroke-Like Episode?

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Abstract

Background

MELAS syndrome, short for mitochondrial encephalomyopathy, lactic acidosis, and stroke-like episodes, is an uncommon mitochondrial disorder that may resemble ischemic stroke in young adults. Distinguishing mitochondrial stroke-like episodes from vascular stroke is difficult, especially in peripheral centers with limited access to advanced neuroimaging, metabolic testing, and mitochondrial deoxyribonucleic acid analysis.

Case Summary

A woman in her early 30s presented with two recurrent hyperacute neurologic episodes characterized mainly by unilateral motor deficits and headache. Her National Institutes of Health Stroke Scale (NIHSS) scores were 5 during the first event and 6 during the second. Intravenous thrombolysis was administered in both episodes; in the most recent event, the onset-to-needle time was 3.5 hours. In both admissions, neurologic deficits resolved completely, and she was discharged with an NIHSS score of 0. Computed tomography of the brain in both events was reported as lacunar infarction. Electrocardiography was normal, and digital subtraction angiography revealed no stenosis or occlusion. Glycated haemoglobin and lipid profile were within normal limits.

Discussion

Young age, recurrence, normal angiographic findings, complete neurologic recovery, and associated headache broaden the differential diagnosis to include stroke mimics, including mitochondrial stroke-like episodes. However, the abrupt onset, predominantly motor presentation, and repeated lacunar imaging pattern favor a vascular mechanism over a typical MELAS-related stroke-like episode.

Conclusion

This case underscores the diagnostic challenge of recurrent young-onset stroke and supports further evaluation with magnetic resonance imaging, serum lactate, electroencephalography, and mitochondrial deoxyribonucleic acid testing before attributing recurrent focal deficits to MELAS.

Keywords: MELAS syndrome; young-onset stroke; stroke-like episode; thrombolysis; diagnostic challenge

ID_78 Research / Neuro-Vascular

ARTIFICIAL INTELLIGENCE-ASSISTED CODE STROKE ACTIVATION FOR IDENTIFICATION OF THROMBOLYSIS-ELIGIBLE STROKE: A SYSTEMATIC REVIEW AND APPLICATION DEVELOPMENT

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Abstract

Background
Early identification of acute ischemic stroke in emergency departments is essential to ensure timely reperfusion therapy, particularly intravenous thrombolysis. Delays in stroke recognition and code stroke activation may lead to missed therapeutic windows and poorer clinical outcomes. Artificial intelligence (AI) has emerged as a promising tool to support rapid stroke detection, triage, and clinical decision-making.

Method
A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews guidelines to evaluate the role of artificial intelligence in acute stroke detection, emergency department triage, and thrombolysis eligibility. Relevant studies published between 2020 and 2025 were retrieved from major medical databases, including PubMed, using predefined keywords related to acute ischemic stroke, artificial intelligence, and thrombolysis. Based on the findings, an AI-assisted clinical decision-support application was developed to support rapid stroke symptom recognition, NIHSS assessment, and code stroke activation.

Results
The literature review indicated that several studies reported improved early stroke recognition and reduced delays in emergency stroke pathways. The developed application integrates symptom input, automated risk stratification, and NIHSS-based evaluation to identify patients potentially eligible for thrombolysis.

Discussion
AI-assisted triage systems may enhance clinical workflow in emergency departments and support faster decision-making in acute stroke management.

Conclusion
AI-assisted code stroke activation has the potential to accelerate the identification of thrombolysis-eligible acute ischemic stroke patients and improve the efficiency of emergency stroke care.

Keywords: acute ischemic stroke, artificial intelligence, thrombolysis, code stroke, emergency department

ID_79 Research / Neuro-Behavior

Potential Neurobiological Mechanisms of Curcumin Supplementation in Insomnia Disorder: A Systematic Review

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Abstract

Background
Insomnia is one of the most common sleep disorders worldwide, characterized by difficulty initiating or maintaining sleep, which results in impaired cognitive function. With the increasing psychosocial stress and lifestyle changes, the global prevalence of insomnia continues to rise. Currently, available pharmacological treatments for insomnia can improve symptoms but are often associated with side effects, risk of dependence, and high costs. Therefore, curcumin is expected to be a potential alternative therapy for insomnia. The aim of this study was to investigate the effect of curcumin supplementation consumption and sleep quality in individuals with insomnia.

Method
A search was conducted on four databases using keywords "curcumin", "insomnia", "sleep disorder". Studies investigating the mechanism of curcumin supplementation on sleep-related parameters in different populations were included.

Results
Curcumin influences sleep quality through several mechanism: (1) as a neuroprotective agent by reactive oxygen species scavenging and expressions of antioxidants like glutathione peroxidase, superoxide dismutase, and catalase; (2) decreases neurotoxicity, increases autophagy, brain-derived neurotrophic factor, and nerve growth factor; (3) as a potent anti-inflammatory agent that inhibits pro-inflammatory cytokines which disrupt sleep.

Discussion
Collectively, these findings demonstrate that curcumin attenuates neuroinflammation and oxidative stress associated with insomnia. While several studies reported improvements in sleep quality following curcumin supplementation, some studies found no significant effect, possibly due to differences in dosage, formulation, or study design.

Conclusion
Curcumin has been shown to have therapeutic effect for patients with insomnia disorder. Future research should focus on controlled clinical trials using standardized dosing and therapeutic efficacy.

Keywords: Curcumin, insomnia, neuro-inflammation, sleep disorder

ID_80 Case Report / Neurophysiology (Epilepsy)

Levetiracetam and Lamotigirine Induced Syndrom Steven – Johnson Syndrome : A Case Report

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Abstract

Background
Epilepsy is a chronic neurological disorder that requires antiepileptic drug therapy (AED) to achieve optimal seizure control. One of the most severe adverse drug reactions of AED is Stevens-Johnson syndrome (SJS). SJS is an acute life-threatening mucocutaneous reaction, characterized by extensive necrosis and detachment of the epidermis from the skin. The association of SJS with phenytoin and CBZ is well known, but it is not so well reported for other antiepileptic agents, including some newer ones such as levetiracetam and lamotrigine

Case Summary
A 17-year-old female presented with red rashes all over her body accompanied by itching, blisters, and pain on the oral mucosa since 14 days before hospitalization. The patient was previously diagnosed with symptomatic epilepsy and taking levetiracetam and lamotigrine. Patient had craniotomy procedure in 2023 and neuroimaging examination showed traumatic intracranial hemorrhage in the frontal lobe. Physical examination showed generalized hyperpigmented patches and crusting in the perioral region. The patient treated with medical therapy and the lesions regressed within 3 weeks.

Discussion
Levetiracetam causes SJS less frequently than lamotigrine, due to its pre-synaptic voltage-gated sodium channel inhibitor activity. Pathogenesis of SJS is not completely understood. Although SJS is rare, it has a significant mortality rate of about 10% and should be treated promptly with supportive therapies.

Conclusion
SJS is one of the rare but severe adverse effect of AED medication. Physicians should be aware of the early signs of rash and advised to discontinue AED administration as an initial management to prevent worsening of SJS symptoms

Keywords: Epilepsy, AED, Lamotigrine, Levetiracetam, SSJ

ID_81 Case Report / Neuro-Vascular

Visual Hallucinations as an Unusual Presentation of Temporal Lobe Infarction

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Abstract

Background
Stroke typically presents with focal neurological deficits. However, temporal lobe infarction may cause psychiatric symptoms such as hallucinations, potentially obscuring the underlying vascular etiology.

Case Summary
A 64-year-old male presented with visual hallucinations and incoherent speech three days prior to admission. He had no prior psychiatric history. Due to prominent psychotic symptoms, the patient was initially referred to a psychiatrist for suspected acute psychosis. Further history obtained from his wife revealed poorly controlled hypertension. Physical examination revealed a blood pressure of 170/90 mmHg. Neurological examination revealed no focal motor or sensory deficits except for a positive Babinski sign. Noncontrast head CT revealed an acute infarction in the left temporal lobe. The diagnosis was revised to acute ischemic stroke. The patient was treated according to the acute ischemic stroke protocol and showed gradual clinical improvement.

Discussion
Lesions involving the temporal lobe may disrupt the ventral visual processing pathways and limbic networks responsible for perception and reality monitoring, resulting in visual hallucinations. The absence of classic focal deficits may delay recognition of stroke, particularly in patients without prior psychiatric history.

Conclusion
Acute ischemic stroke should be considered in patients with vascular risk factors presenting with new-onset psychotic symptoms. Early neurological evaluation and neuroimaging are essential to avoid misdiagnosis and ensure timely stroke management.

Keywords: Acute ischemic stroke, visual hallucinations, psychotic symptoms, temporal lobe infarction

ID_82 Case Report /
Neurophysiology (Peripheral Nerve & Neuromuscular)

Early Recognition of Bell's Palsy in Primary Healthcare: A Case Report of Acute Facial Paralysis

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Abstract

Background
Bell's palsy is the most common cause of acute peripheral facial paralysis characterized by sudden onset unilateral facial nerve dysfunction without an identifiable cause. Early recognition is important to differentiate it from other neurological conditions such as stroke and to ensure appropriate management.

Case Summary
A 47-year-old woman presented to a primary healthcare with a three-day history of sudden onset facial asymmetry, slurred speech, and difficulty closing her left eye. The patient also reported water leakage from the right corner of her mouth while drinking. Physical examination revealed right-sided facial weakness with inability to fully close the left eye and deviation of the mouth. No limb weakness or other neurological deficits were observed. The patient was clinically diagnosed with Bell's palsy and treated with corticosteroid therapy and artificial tears. The patient was advised to follow up at the primary healthcare center until clinical symptoms resolve and quality of life improves.

Discussion
Bell's palsy can present with acute facial paralysis that may mimic stroke, creating diagnostic challenges in primary care settings. Careful clinical evaluation is necessary to distinguish peripheral facial nerve palsy from central neurological causes.

Conclusion
This case highlights the importance of early recognition and clinical examination in patients presenting with acute facial paralysis to ensure timely diagnosis and management of Bell's palsy.

Keywords: Bell's palsy, facial paralysis, stroke mimic, primary care

ID_84 Research /
Neurophysiology (Peripheral Nerve & Neuromuscular)

Effects of Cerebrospinal Fluid Evacuation on Intraoperative Auditory Brainstem Response Monitoring

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Abstract

Background
This study was performed to assess the effect of cerebrospinal fluid (CSF) evacuation on the waveforms of intraoperative Auditory Brainstem Response (ABR) monitoring.

Method
From January 2015 to February 2022, 147 patients underwent brain surgery at Shinshu University Hospital with intraoperative ABR monitoring. Amplitude and latency of the 1st, 3rd, and 5th waves of the ABR at the start of the surgery and post-CSF evacuation were recorded bilaterally. The ABR wave changes between the affected and non-affected sides were compared. The warning sign was defined by a 1 ms latency delay or more than 50% reduction of the ABR 5th wave amplitude compared to the baseline recording.

Results
ABR was monitored in 115 affected sides and 132 non-affected sides. CSF evacuation significantly affected the 1st wave latency ($p<0.001$), 5th wave latency ($p<0.001$) and amplitude ($p<0.001$), 1st–5th wave distance ($p<0.001$), and 3rd–5th wave distance ($p<0.001$) on the affected sides, compared to the non-affected sides. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of ABR were 100%, 82%, 32%, and 100% when the baseline was set before the durotomy, and 100%, 87%, 40%, and 100% when the baseline was established after the durotomy.

Discussion
These findings suggest that physiological changes following CSF evacuation can influence ABR waveforms even before surgical manipulation. Alterations in perilymph dynamics through the cochlear aqueduct may contribute to latency prolongation and amplitude reduction observed after CSF drainage.

Conclusion
CSF evacuation affected ABR latency and amplitude; therefore, the monitoring baseline should be established after CSF evacuation to improve specificity.

Keywords: Auditory Brainstem Response, Intraoperative Neuromonitoring, Neurosurgery, Cerebrospinal Fluid, Cochlear nerve

ID_85 Research / Neuro-Vascular

Efficacy and Safety of Intra-Arterial Tenecteplase After Successful Endovascular Thrombectomy in Acute Ischemic Stroke

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Abstract

Background
The use of adjunctive thrombolytic agents following endovascular thrombectomy (EVT) in acute ischemic stroke has been suggested to improve outcomes. Recently, tenecteplase emerged as a potential alternative to the more widely utilized alteplase, but safety and efficacy regarding its use remain uncertain.

Method
A systematic search was conducted according to PRISMA 2020 guidelines across PubMed, Scopus, and ScienceDirect databases. Randomized controlled trials (RCTs) comparing EVT with and without sequential administration of intra-arterial tenecteplase (IA-TNK) were sought. The quality of each study was assessed using the ROBINS-I tool.

Results
A total of 4 RCTs (n = 1115) were included. IA-TNK is associated with excellent functional outcomes (modified Rankin Scale [mRS] score of 0-1) (RR = 1.23; 95% CI 1.07-1.42; p = 0.005). Furthermore, IA-TNK did not significantly increase the rates of symptomatic ICH (RR = 1.46; 95% CI 0.88-2.40; p = 0.14) and 90 days mortality (RR = 0.92, 95% CI 0.73-1.16; p = 0.49). However, severe systemic bleeding (RR = 1.26, 95% CI 1.02-1.56; p = 0.03) was observed in the IA-TNK group.

Discussion
Our results aligned with earlier meta-analysis investigating adjunctive thrombolysis after EVT. While sICH and mortality did not differ between the groups, excellent functional outcomes in patients receiving IA-TNK is achieved at the cost of possible severe systemic bleeding.

Conclusion
IA-TNK offers a substantial benefit to improve functional outcomes, but caution should be exercised especially in populations with higher bleeding risk.

Keywords: Tenecteplase, Intra-arterial thrombolysis, Endovascular thrombectomy, Acute ischemic stroke

ID_86 Case Report / Neuro-Trauma

Isolated Abducens Nerve Palsy Following Mild Traumatic Brain Injury: An Early Indicator of Increased Intracranial Pressure?

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Abstract

Background

Mild traumatic brain injury (mTBI) is often considered benign, yet intracranial lesions and secondary injury mechanisms such as increased intracranial pressure (ICP) may occur. Abducens nerve palsy is an uncommon but potentially important neurological manifestation following mTBI

Case Summary

A 45-year-old male presented with decreased level of consciousness after a traffic-related head injury. Initial neurological assessment showed a Glasgow Coma Scale score of 13–14. Non-contrast head computed tomography revealed traumatic subarachnoid hemorrhage in the left parietal region and small bilateral temporal lobe contusions without midline shift or mass effect. During hospitalization, the patient developed diplopia, and examination demonstrated isolated left abducens nerve paresis. Persistent headache, nausea, and vomiting raised suspicion of increased ICP. Hyperosmolar therapy with mannitol resulted in marked improvement of headache and gastrointestinal symptoms, although the abducens nerve palsy persisted at discharge. The patient was managed conservatively and discharged in stable condition with planned outpatient follow-up

Discussion

This case illustrates that isolated abducens nerve palsy in mTBI may represent a false-localizing sign related to altered intracranial pressure dynamics rather than focal structural injury. The nerve's long intracranial course, sharp angulation at the petrous apex, and fixation within Dorello's canal increase its susceptibility to stretching during traumatic brain displacement or transient intracranial hypertension

Conclusion

Isolated abducens nerve palsy following mTBI may serve as an early indicator of increased intracranial pressure and should prompt careful neurological monitoring to detect evolving secondary brain injury

Keywords: Abducens nerve; Brain injury; Cranial nerve palsy; Dorello canal; Head trauma

ID_88 Case Report /
Neuro-Ophthalmology & Neuro-Otology

Unilateral Headache Ophthalmoplegia with Severe Ptosis: A Rare Case Report of Tolosa-Hunt Syndrome in Banten Province Hospital

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Abstract

Background
Tolosa-Hunt syndrome (THS) is a rare disorder characterized by severe unilateral orbital or periorbital headache accompanied by ophthalmoplegia due to idiopathic granulomatous inflammation of the cavernous sinus or superior orbital fissure. THS is often misdiagnosed because its symptoms resemble other conditions including infectious, neoplastic, and vascular diseases. Careful clinical assessment is required to exclude alternative etiologies, and a favorable response to corticosteroids may support the diagnosis.

Case Summary
A 56-year-old man presented with a three-month history of sudden severe left-sided headache unresponsive to analgesics, followed by progressive left eyelid ptosis and blurred vision. Visual acuity was 6/6 in the right eye and 6/50 in the left eye, improving to 6/10 with pinhole correction. Extraocular movement examination demonstrated ophthalmoparesis with severe limitation in multiple directions. Slit lamp examination revealed a dendritic corneal lesion. Laboratory findings showed elevated erythrocyte sedimentation rate (108 mm/hour) and increased D-dimer levels. Computed tomography revealed left maxillary, ethmoidal, and frontal sinusitis. Magnetic resonance imaging was not performed due to limited availability. After exclusion of other etiologies and partial response to corticosteroid therapy, a presumptive diagnosis of THS was established. Follow-up showed mild improvement of ptosis, although ophthalmoparesis persisted.

Discussion
THS typically presents as painful ophthalmoplegia involving cranial nerves III, IV, and VI. MRI is useful to detect cavernous sinus inflammation but diagnosis may remain clinical when imaging is unavailable.

Conclusion
THS should be considered in patients presenting with unilateral headache and ophthalmoparesis. Early recognition and careful exclusion of other etiologies are essential for appropriate management.

Keywords: Tolosa-Hunt syndrome, painful ophthalmoplegia, cavernous sinus, unilateral headache

ID_89 Research / Neuro-Vascular

Association Between the Wells Score and Functional Clinical Outcomes Among Patients with Acute Ischemic Stroke

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Abstract

Background
Acute ischemic stroke is frequently associated with deep vein thrombosis (DVT), which may lead to pulmonary embolism and increased mortality. The Wells score, a clinical prediction tool for DVT, reflects thromboembolic risk and may be associated with poorer functional outcomes, making it a potential early screening parameter in patients with acute ischemic stroke.

Method
This prospective cohort study included 35 patients who meet the inclusion criteria between May to November 2025. DVT risk was assessed using the Wells score, and functional outcomes were evaluated using the modified Rankin Scale (mRS). Correlations were analyzed using Spearman's test ($p < 0.05$)

Results
Subjects predominantly had a moderate Wells score probability (65.7%) and poor functional outcomes with higher mRS scores (77.1%). Spearman correlation showed a weak significant positive association between the Wells score and mRS score ($r = 0.347$; $p = 0.041$), indicating that higher Wells scores were associated with poorer functional outcomes.

Discussion
The Wells score is a clinical prediction tool used for estimating DVT probability. In acute ischemic stroke, it can serve as an early screening method, where a score ≥ 2 indicates an approximately 40% probability of DVT. Common contributing factors in stroke patients include paralysis, muscle weakness, and prolonged immobilization, which increase the risk of DVT and subsequent thromboembolic complications that may worsen functional clinical outcomes.

Conclusion
The Wells score was significantly associated with functional outcomes in acute ischemic stroke, showing a weak positive correlation and indicating its potential value for early DVT risk assessment.

Keywords: Acute Ischemic Stroke ; Deep Vein Thrombosis ; Wells Score

ID_90 Research / Neuro-Vascular

Bidirectional Videoconference vs Telephone Consultation in Telestroke Activation for Acute Stroke Care: A Systematic Review and Meta-Analysis

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Abstract

Background
Telemedicine is widely used around the world in emergency settings, especially in acute stroke care which is known as telestroke. Nonetheless, the evidence of the best method for telestroke is still limited. This study aims to determine the most optimal method for telestroke activation.

Method
A systematic search in PubMed, Scopus, ScienceDirect, Taylor & Francis, and EBSCO was conducted to identify studies published up to January 2026. Eligible studies included patients with acute stroke presented to the hospital, in-hospital telestroke utilization with bidirectional videoconference method, and telephone consultation as the comparator. Risk of bias was assessed using the RoB 2 and ROBINS-I tools. A random-effects meta-analysis was performed using RStudio.

Results
Five studies with a total of 541 patients involving in-hospital telestroke activation were included. Telestroke with videoconference method effectively decreased the onset-to-treatment time (standardised mean difference -5.60 min; 95% CI -26.68, 15.48; I2 = 57.0%) and intracranial hemorrhage rate (OR 0.68; 95% CI 0.15, 3.07; I2 = 5.8%).

Discussion
In-hospital telestroke with bidirectional videoconference method associated with better clinical outcomes in contrast to the traditional consultation via telephone. However, substantial heterogeneity and moderate to high risk of bias were observed. Hence, further studies with larger populations and minimal heterogeneity are needed before routine clinical application of telestroke.

Conclusion
Bidirectional videoconference is a promising approach for in-hospital telestroke activation. Hence, its application may improve acute stroke care.

Keywords: Acute ischemic stroke; telestroke; telephone; thrombolysis; door-to-needle time

ID_91 Research / Neuro-Vascular

Remote Ischemic Preconditioning in Aneurysmal Subarachnoid Hemorrhage: A Systematic Review and Meta-Analysis

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Abstract

Background
Aneurysmal subarachnoid hemorrhage (aSAH) is associated with delayed cerebral injury (DCI), leading to poor outcomes. Remote ischemic preconditioning (RIPC) may mitigate early brain injury through anti-inflammatory effects and improved cerebral perfusion. However, its clinical efficacy in aSAH remains unclear.

Method
Following PRISMA guidelines, we searched PubMed, Cochrane, ScienceDirect, and Scopus through February 2025 for RCTs and observational studies comparing RIPC with controls in patients with aSAH receiving conventional treatment. The primary outcome is DCI; secondary outcomes included vasospasm, mortality, hospital length of stay (LOS), and safety. Risk of bias was assessed using the Cochrane ROB-2 and ROBINS-I. Pooled effects were estimated using a random-effects model in RevMan 5.4.

Results
Four studies (200 patients) were included. Three studies showed low risk of bias and one had moderate risk. Meta-analysis revealed no significant differences between RIPC and control in DCI (OR 0.58, 95% CI 0.29–1.14; P = 0.12), vasospasm (OR 1.06, 95% CI 0.50–2.24; P = 0.88), and mortality (OR 0.75, 95% CI 0.32-1.76; P= 0.51). However, two studies reported shorter hospital LOS, and across all studies RIPC was associated with only mild, reversible adverse events.

Discussion
Despite the non-significant results, RIPC may confer neuroprotection against DCI when applied intermittently, whereas daily application may lead to "hyperconditioning," potentially desensitizing endogenous protective pathways. Optimal cuff pressure may be individualized to the minimal pressure required for arterial occlusion rather than fixed numerical thresholds.

Conclusion
RIPC is a safe adjunctive therapy that may reduce hospital LOS, with greater efficacy when applied intermittently.

Keywords: remote ischemic preconditioning (RIPC), aneurysmal subarachnoid hemorrhage (aSAH), delayed cerebral ischemia (DCI), vasospasm, mortality, hospital length of stay (LOS)

ID_92 Research / Neuro-Oncology

Diagnostic Accuracy of Combined Intraoperative Neurophysiological Monitoring for Predicting Neurological Deficits During Intramedullary Spinal Cord Tumor Resection: A Meta-Analysis

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Abstract

Background

Intramedullary spinal cord tumor (IMSCT) resection carries a high risk of postoperative neurological deficits due to injury to critical spinal cord pathways. Intraoperative neurophysiological monitoring (IONM) using Somatosensory Evoked Potentials (SSEP), Motor Evoked Potentials (MEP), and D-wave may improve detection of intraoperative injury, but added benefit of combining modalities remains unclear.

Method

PRISMA-guided systematic review was conducted using PubMed, Cochrane Library, and Scopus through February 2026. Studies evaluating SSEP, MEP, and D-wave during IMSCT surgery were included. Postoperative sensory and motor deficits assessed within 24–48 hours using the McCormick Scale or equivalent measures served as the reference standard. Pooled diagnostic accuracy was estimated using a bivariate random-effects model, and comparisons using Z-tests.

Results

A total of 750 cases from 18 studies were analyzed. Single-modality showed limited sensitivity: SSEP demonstrated 49.1% sensitivity and 85.2% specificity, MEP 57.9% sensitivity and 87.5% specificity, and D-wave 20.0% sensitivity with 93.0% specificity. Dual-modality SSEP+MEP improved performance (sensitivity 83.2%, specificity 90.0%), while triple-modality SSEP+MEP+D-wave achieved the highest accuracy (sensitivity 99.8%, specificity 95.2%). Triple-modality monitoring was significantly superior to SSEP (p=0.028), MEP (p=0.011), and D-wave (p=0.035), but not significantly different from SSEP+MEP alone (p=0.320).

Discussion

Combined monitoring improves diagnostic performance by integrating complementary information from sensory and motor pathways. However, because MEP already reflects corticospinal tract function, the additional contribution of D-wave may be limited when SSEP and MEP are used together.

Conclusion

Combined IONM improves prediction of postoperative neurological deficits during IMSCT surgery. SSEP+MEP may represent the most efficient monitoring strategy

Keywords: intramedullary, spinal cord tumor, intraoperative neurophysiological monitoring

ID_93 Research / Neuro-Infection

Advancing Therapeutic Innovation in Neurosyphilis: An Umbrella Review and Integrated Bioinformatic Analysis to Identify Repurposable Drug Candidates

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Abstract

Background
Neurosyphilis clinical cure rates range from 18–44%, with 33–86% of patients experiencing persistent psychiatric manifestations. Amidst a 32% case increase in the USA (2020–2021), the effectiveness of crystalline penicillin remains insufficiently explored. The Tp47 lipoprotein of Treponema pallidum is a potential therapeutic target. This umbrella review evaluates current treatments and explores drug repurposing targeting Tp47 through integrated bioinformatics.

Method
This PRISMA-compliant review used ROBIS and AMSTAR-2 for quality assessment. Bioinformatics involved virtual screening of 4,947 repurposable compounds against Tp47 using Molegro Virtual Docker. Ligands ranked by MolDock, ReRank, and H-Bond scores.

Results
Five systematic reviews (2,387 participants) were included. Aqueous penicillin was the primary regimen, followed by ceftriaxone. Clinical improvement occurred in 81.7% of patients; 18.3% had persistent symptoms. Serological improvement was noted in 67.7% of serum and 50.0% of CSF tests; CSF white blood cells and protein normalized in 77.1% and 75.7% of cases. Meta-analysis (236 cases) showed no significant difference between ceftriaxone and penicillin G (OR 2.85, 95% CI 0.41–19.56). A CCA analysis will be performed. Screening identified nine candidates with MolDock scores from -199.358 to -138.848, forming stable hydrogen-bond and steric interactions. These compounds demonstrated stronger predicted binding than reference beta-lactam antibiotics, suggesting potential inhibitory activity against Tp47.

Discussion
Current therapies show variable responses and rely on repurposed antibiotics. Identified candidates exhibit superior binding stability compared to standard treatments, highlighting their potential as novel Tp47 inhibitors.

Conclusion
Tp47-targeted drug repurposing offers promising candidates for further validation to address neurosyphilis therapeutic gaps.

Keywords: Neurosyphilis, Treponema pallidum, Drug Repurposing, Bioinformatics, Tp47 Protein

ID_94 Research / Neuro-Oncology

CANAGLIFLOZIN TARGETS METABOLIC VULNERABILITIES IN GLIOBLASTOMA: NETWORK PHARMACOLOGY AS A PRECISION MEDICINE STRATEGY IN NEUROONCOLOGY

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Abstract

Background

Glioblastoma Multiforme (GBM) is an aggressive brain tumor with poor prognosis. Metabolic disturbances such as hyperglycemia and insulin resistance, rather than Type 2 Diabetes Mellitus itself, are linked to worse outcomes. Canagliflozin, an SGLT2 inhibitor, may target these vulnerabilities. This study explores its molecular targets and pathways in GBM using network pharmacology

Method

: A network pharmacology-based bioinformatics analysis was performed. Canagliflozin's structure was retrieved from PubChem, and potential targets were predicted using SwissTargetPrediction. GBM-related genes were obtained from GeneCards, with overlapping targets identified via Venn analysis. Protein–protein interactions were analyzed using STRING and Cytoscape, hub genes ranked with CytoHubba, and functional enrichment (GO and KEGG) conducted to elucidate key pathways.

Results

Thirteen overlapping targets were identified, including EGFR, JAK2, MTOR, ERBB2, and BRAF, forming a highly interconnected PPI network ($p = 1.22 \times 10$). Key hub genes were dominated by EGFR- and mTOR-related signaling. GO enrichment indicated roles in protein phosphorylation and tyrosine kinase activity, while KEGG pathways highlighted EGFR and ErbB signaling, endocrine resistance, and central carbon metabolism in cancer

Discussion

Hub genes regulate GBM proliferation mainly through EGFR and ErbB pathways, aligning with clinical associations of hyperglycemia and insulin resistance with poor prognosis. Canagliflozin may suppress tumor growth and enhance radiosensitivity by activating AMPK and inhibiting mTOR, JAK2, and SRC. These effects disrupt metabolic reprogramming and support precision neurooncology strategies targeting GBM-specific vulnerabilities.

Conclusion

Network pharmacology analysis reveals Canagliflozin targets critical oncogenic and metabolic pathways in GBM, offering a rationale for precision medicine strategies in neurooncology and highlighting its potential for therapeutic repurposing.

Keywords: Canagliflozin, glioblastoma, network pharmacology, neurooncology, precision medicine, bioinformatics

ID_95 Research / Neuro-Vascular

Turning Failure Into Success: Meta-Analysis of Rescue Stenting Following Unsuccessful Mechanical Thrombectomy in Acute Ischemic Stroke

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Abstract

Background

: Mechanical thrombectomy (MT) is an established treatment for acute ischemic stroke. However, a subset of patients experience MT failure, often due to intracranial atherosclerotic disease. Rescue stenting (RS) has been proposed as a salvage strategy, but its clinical benefit remains uncertain.

Method

We conducted a systematic review and meta-analysis in accordance with PRISMA guidelines. Searches were performed in Medline, Google Scholar, and Cochrane Central. Eligible studies comparing RS versus non-rescue treatment after MT failure were included. Pooled estimates were calculated using risk ratios (RR) with 95% confidence intervals (CI). Heterogeneity was assessed using Chi and I statistics, and subgroup analyses were performed when I exceeded 50%. Outcomes assessed were mortality, symptomatic intracranial hemorrhage (sICH), functional independence (mRS 0–2), and successful reperfusion (mTICI 2b–3).

Results

Seven studies met inclusion criteria. After sub-group analysis, our study found that RS significantly reduced mortality (RR <1, Z = 2.20, P = 0.03; I = 0%), decreased sICH (RR <1, Z = 2.05, P = 0.04; I = 0%), improved functional independence (RR >1, Z = 2.87, P = 0.004; I = 23%), and increased successful reperfusion (RR >1, Z = 4.52, P < 0.00001; I = 0%).

Discussion

Rescue Stenting may improve outcomes after failed Mechanical Thrombectomy by maintaining vessel patency and preventing re-occlusion, particularly in intracranial atherosclerotic lesions. Sustained reperfusion may explain the observed reductions in mortality and hemorrhagic complications, as well as improved functional recovery in patients with Acute Ischemic Stroke.

Conclusion

RS after failed MT is associated with lower mortality, fewer hemorrhagic complications, better functional outcomes, and higher reperfusion rates. These findings suggest RS is an effective and safe salvage option in selected patients with acute ischemic stroke

Keywords: Rescue stenting, mechanical thrombectomy failure, acute ischemic stroke, risk ratio, modified Rankin Scale.

ID_96 Research / Neuro-Vascular

Admission Neutrophil-to-Lymphocyte Ratio Predicts In-Hospital Mortality in Late-Presenting Ischemic Stroke

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Abstract

Background
A substantial proportion of ischemic stroke patients in secondary care settings present beyond the therapeutic window for reperfusion therapy due to geographic barriers and limited public awareness. In this population, early risk stratification remains challenging. The neutrophil-to-lymphocyte ratio (NLR), an accessible marker of systemic inflammation, has been associated with poor outcomes in acute ischemic stroke, but evidence in late-presenting patients remains limited. This study aims to evaluate the association between admission NLR and in-hospital mortality among ischemic stroke patients who present more than 24 hours after symptom onset.

Method
This retrospective cohort study included 65 patients presenting >24 hours after symptom onset. Receiver operating characteristic (ROC) analysis determined the optimal NLR cut-off. Univariate logistic regression was used to assess the association between elevated NLR and in-hospital mortality.

Results
In-hospital mortality was 16.9% (n=11). The median NLR was significantly higher in non-survivors than survivors (7.08 vs. 3.27; p=0.005). ROC analysis identified an optimal NLR cut-off value of 5.24 (AUC= 0.772). Patients with NLR ≥5.24 had significantly higher odds of mortality (OR= 15.75; 95%CI: 2.99–82.92; p= 0.001).

Discussion
Because these patients arrive beyond the established windows for acute reperfusion, management relies heavily on secondary prevention and complication management. The NLR could serve as a valuable triage marker to identify patients at risk of clinical deterioration, justifying closer observation and early intervention for complications.

Conclusion
Elevated admission NLR is strongly associated with increased in-hospital mortality in late-presenting ischemic stroke patients and may serve as a practical biomarker for early risk stratification in resource-limited settings.

Keywords: ischemic stroke, neutrophil-to-lymphocyte ratio, in-hospital mortality, neuroinflammation

ID_98 Case Report / Neuro-Infection

Varicella Encephalitis in a Young Immunocompetent Adult: A Rare Case

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Abstract

Background

Viral Encephalitis caused by Varicella Zoster Virus (VZV) is uncommon in immunocompetent young adults, with only a limited number of cases reported in the literature.

Case Summary

A 35-year-old male came with severe headache, memory impairment, confusion, and brief syncope. He was alert and had no focal neurological deficits. The initial Montreal Cognitive Assessment (MOCA) was 25/30. The affected domain was recall memory. He had no previous illnesses or Varicella infections. Serologic tests for HIV, Hepatitis B and C Virus were negative. A Brain Computed Tomography (CT) Scan, continued with a contrast-enhanced Brain Magnetic Resonance Imaging (MRI), revealed multiple infarcts in the right cerebellum. Cerebrospinal Fluid (CSF) analysis demonstrated elevated protein levels with positive Nonne and Pandy test, and Polymerase Chain Reaction (PCR) testing of CSF was positive for VZV. Intravenous Acyclovir was given for fourteen days. His headache improved within four days, and his MOCA score improved to 30/30 at discharge.

Discussion

Varicella Encephalitis (VE) presents with a wide spectrum of clinical manifestations. In this case, the patient initially presented with altered mental status following syncope, preceded by a severe headache. Early imaging suggested a cerebrovascular event due to the presence of cerebellar infarcts. However, the presence of confusion and cognitive impairment raised suspicion of an intracranial infection. Lumbar Puncture (LP) was therefore performed, confirming VZV infection. Clinical symptoms and cognitive function improved following intravenous Acyclovir therapy.

Conclusion

Diagnosing VE in immunocompetent adults is challenging due to its nonspecific presentation. Early LP should be considered when atypical neurological symptoms suggest possible intracranial infection.

Keywords: Cognitive Impairment, Varicella Zoster Virus, Viral Encephalitis, Varicella Encephalitis.

ID_99 Case Report / Neuro-Infection

Relapsing Plasmodium vivax Cerebral Malaria in a Returning Soldier : Diagnostic Challenges in Tropical Endemic Settings

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Abstract

Background
Plasmodium vivax (P. vivax) malaria has traditionally been regarded as a benign infection. Cerebral involvement in P. vivax infection is uncommon and becomes more complex when the episode presents as a relapse. Recognition of relapsing cerebral malaria may be challenging because clinical manifestations often overlap with other tropical febrile illnesses.

Case Summary
We report a 33-year-old Indonesian soldier presenting with recurrent high-grade fever and severe headache one week after discharge from another hospital with suspected dengue infection. Further anamnesis revealed that he had served in Papua for five years and returned to Java a year ago. On admission, he was febrile and agitated with severe diffuse headache (Visual Analog Scale (VAS) score 8). His neurological status showed fluctuating consciousness with Glasgow Coma Scale (GCS) scores of 14–15, accompanied by episodes of confusion and temporal disorientation. Laboratory evaluation revealed anemia, leukocytosis, thrombocytopenia, elevated urea and peripheral blood smear confirmed P. vivax. Chest radiography suggestive of pulmonary edema and cranial computed tomography (CT) showed diffuse cerebral edema. The patient required intensive care due to neurological deterioration but subsequently improved with intravenous artesunate and supportive therapy.

Discussion
Relapsing P. vivax malaria with cerebral involvement illustrates the diagnostic challenge posed by overlapping tropical febrile illnesses, neurological manifestations, and prior endemic exposure with waning semi-immunity.

Conclusion
Clinicians should maintain a high index of suspicion for malaria in febrile patients with neurological symptoms, especially with prior endemic exposure, as early recognition and treatment are crucial to prevent severe complications.

Keywords: Cerebral malaria, relapse malaria, diagnostic challenges

ID_100 Case Report / Movement Disorder

Clonazepam as an Alternative Therapy for Benign Essential Blepharospasm

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Abstract

Background
Benign Essential Blepharospasm (BEB) is a focal cranial dystonia characterized by involuntary, repetitive, bilateral contractions of the orbicularis oculi muscles, leading to intermittent or persistent eyelid closure. The condition may cause significant functional impairment in daily activities. Botulinum toxin type A injection is considered the first-line therapy; however, limited availability in some settings necessitates alternative pharmacological treatments. Clonazepam, a benzodiazepine, has GABAergic modulatory effects that may suppress hyperactivity in motor circuits involved in dystonia.

Case Summary
A 51-year-old woman presented with uncontrolled bilateral blinking movements that began one month before admission and worsened over the previous two weeks. The movements disappeared during sleep and were not associated with other neurological deficits. Neurological examination revealed bilateral spasms of the orbicularis oculi muscles with an initial Jankovic Rating Scale (JRS) score of 7. Laboratory results were within normal limits. The patient initially received trihexyphenidyl 1 mg/day, increased to 2 mg/day, resulting in partial improvement (JRS 4) but accompanied by sedation and impaired concentration. Treatment was subsequently switched to clonazepam 0.75 mg/day, leading to significant symptom improvement (JRS 3) without notable adverse effects and with improved daily functioning.

Discussion
BEB is associated with dysfunction of the basal ganglia–thalamo–cortical circuit and impaired central inhibition of the trigemino-facial reflex pathway. Clonazepam enhances GABA-A–mediated inhibition, reducing excitability of brainstem reflex pathways. In settings with limited access to botulinum toxin, clonazepam may serve as an effective alternative therapy.

Conclusion
Clonazepam initiated at a low dose may be considered a therapeutic option for blepharospasm when other treatments provide unsatisfactory results.

Keywords: Benign Essential Blepharospasm, focal dystonia, clonazepam, pharmacological therapy, Jankovic Rating Scale.

ID_101 Case Report / Neuro-Vascular

Neurogenic Stunned Myocardium in Acute Ischemic Stroke: Case Reports Highlighting the Complexity of the Brain-Heart Axis

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Abstract

Background
Acute ischemic stroke may trigger cardiovascular complications by disrupting central autonomic pathways, leading to neurogenic stunned myocardium (NSM). Characterized by transient myocardial dysfunction and electrocardiographic (ECG) abnormalities without coronary obstruction, NSM frequently mimics acute coronary syndrome (ACS). This similarity creates significant diagnostic and therapeutic challenges, particularly in resource-limited settings.

Case Summary
We report two patients with acute ischemic stroke and ECG findings suggestive of ACS. The first case, a 46-year-old male with partial left middle cerebral artery (MCA) stenosis, presented with recurrent transient right hemiparesis; ECG revealed transient ST-segment elevation in the inferior leads without concomitant troponin elevation or echocardiographic wall motion abnormalities. The second, a 62-year-old female, presented with right hemiparesis and persistent ST-segment elevation in inferior and lateral leads, accompanied with slight elevated troponin levels, and reduced ejection fraction. In both cases, typical cardiac symptoms were absent. Due to the unavailability of immediate coronary angiography, a conservative approach was adopted, prioritizing stroke management.

Discussion
NSM likely results from a catecholamine surge following neurologic injury, with the insular cortex playing a pivotal role in autonomic regulation. Differentiating NSM from ACS is challenging without coronary angiography. Diagnosis relies on clinical context, the absence of chest pain, and neuroimaging.

Conclusion
NSM represents a critical manifestation of the 'brain-heart axis' that closely mimics ACS. These cases highlight the diagnostic and therapeutic challenges encountered when acute stroke and myocardial injury coexist, particularly in settings where coronary angiography is unavailable. Consequently, a multidisciplinary approach remains critical for navigating these clinical challenges.

Keywords: neurogenic stunned myocardium, acute ischemic stroke; brain-heart axis; myocardial injury; electrocardiographic changes; autonomic dysfunction

ID_103 Case Report / Neuro-Behavior

Autoimmune Thyroid Associated Moyamoya Disease with Favorable Outcome

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Abstract

Background

Moyamoya Disease (MMD) is a progressive vasculopathy characterized by stenosis of Internal Carotid Artery (ICA) and Circle of Willis, leading to fragile collateral vessel formation. Autoimmune disorders may contribute to its development, with a reported prevalence of 45.36/100,000 among patients with autoimmune thyroid disease (ATD).

Case Summary

A 31-year-old woman with a two-year history of ATD, previously treated with antithyroid medication but discontinued after symptomatic improvement, presented with sudden right-sided sensory disturbance followed by right-sided weakness and speech difficulty within one day.

Neurological examination revealed right hemiparesis, hemisensory, and global aphasia. Brain MRI–MRA with contrast demonstrated multiple moyamoya-like collateral vessels with bilateral occlusion of the M1-Middle Cerebral Artery and A1-Anterior Cerebral Artery, along with mild-to-severe stenosis of ICA.

Laboratory examination showed elevated free T4 levels, positive lupus anticoagulant, and anticardiolipin IgG antibodies with previous positivity for anti-thyroid peroxidase and antinuclear antibodies. She was diagnosed with MD associated with ATD, Systemic Lupus Erythematosus, and Antiphospholipid Syndrome. She was treated with thiamazole, pulse-dose corticosteroids, immunosuppressive therapy, warfarin, and aspirin. Before discharge, free T4 levels normalized. At 1.5-month follow-up, neurological deficits improved and she regained sentence production after initial global aphasia.

Discussion

MMD may present with stroke, seizures, headache, and cognitive impairment. Language impairment reported approximately 26% cases. Autoimmune disorders occur in 22–31% of patients with MMD, suggesting an immunological contribution. Thyroid dysfunction may accelerate disease progression through sympathetic activation and intracranial vasoconstriction.

Conclusion

This case highlights the association between ATD and MMD, emphasizing importance of evaluating autoimmune etiologies in young patients with stroke.

Keywords: ATD, MMD

ID_104 Research / Neuro-Vascular

The Relationship Between Serum S100B Protein Levels and Clinical Outcomes in Patients with Spontaneous Intracerebral Hemorrhage at Adam Malik General Hospital, Medan

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Abstract

Background
Elevated serum S100B levels have been reported to correlate with neurological severity, and clinical outcomes in patients with spontaneous intracerebral hemorrhage (ICH), suggesting potential as a prognostic biomarker for predicting clinical outcomes in patients with ICH.

Method
This cross sectional study included 26 patients with ICH treated at Adam Malik General Hospital, Medan, between June and November 2025. Serum S100B levels were measured within 48 hours after hemorrhage onset using the Enzyme-Linked Immunosorbent Assay (ELISA) method. Clinical outcomes were evaluated using the modified Rankin Scale (mRS). Data normality was assessed using the Shapiro–Wilk test. The relationship between serum S100B levels and clinical outcomes was analyzed using Spearman correlation with significance level of $p<0.05$.

Results
The majority of study subjects had mild ICH volume (65.4%). The median S100B level at 48 hours was 127.4 pg/mL. Spearman correlation showed a positive association between serum S100B and mRS scores ($r=0.434$; $p=0.02$), indicating worse clinical outcomes with higher S100B levels.

Discussion
Elevated serum S100B levels reflect the extent of brain injury and secondary inflammatory responses. The observed correlation with mRS suggests that S100B may serve as a useful biomarker for assessing neurological damage and predicting functional outcomes in patients with spontaneous ICH.

Conclusion
Serum S100B levels are associated with clinical outcomes in patients with spontaneous intracerebral hemorrhage and may serve as a potential prognostic biomarker.

Keywords: Spontaneous intracerebral hemorrhage; S100B protein; modified Rankin Scale; biomarker.

ID_105 Case Report / Neuro-Vascular

Beyond Thrombosis: Spontaneous Subdural Hemorrhage Unveiling Suspected Antiphospholipid Syndrome in the Puerperium

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Abstract

Background

Postpartum Subdural Hemorrhage (SDH) necessitates autoimmune investigation. This case identifies Antiphospholipid Syndrome (APS) as a potential etiology, urging its inclusion in the differential diagnosis for young patients

Case Summary

A 32-year-old woman, 40 days postpartum, was admitted to the emergency department with a sudden decrease in consciousness preceded by severe headache, accompanied by seizures and vomiting. A head CT scan revealed a 66.4 cc subdural and intraparenchymal hemorrhage, for which a craniectomy for hematoma evacuation was performed. Five months post-operation, the patient reported a history of headaches starting in the early gestation of her second pregnancy. Laboratory investigations yielded positive results for antinuclear antibodies (ANA) and anti-beta-2 glycoprotein I antibodies with a titer of 118.7, fulfilling the diagnostic criteria for APS.

Discussion

Although APS is primarily recognized as a thrombotic disorder, hemorrhagic complications can occur and may be the initial clinical presentation. Subdural hemorrhage in this context is a complication resulting from decreased platelet levels driven by autoantibody processes. These findings suggest that the bleeding is caused by antibodies attacking membranes, rendering the bridging veins in the subdural space highly susceptible to hemorrhage. In cases of spontaneous SDH in young women, it is crucial to thoroughly explore medical and pregnancy histories to identify prothrombotic risk factors, ensuring a more targeted diagnostic workup. Autoimmune should be a key consideration in establishing the causal diagnosis

Conclusion

Spontaneous SDH is a rare complication of APS. Screening for autoimmune and thrombophilic disorders should be considered, as early recognition of APS has important implications for secondary prevention and long term management.

Keywords: APS, Spontaneous SDH, Postpartum

ID_106 Research / Neurophysiology (Epilepsy)

Statins in Post-Stroke Epilepsy: A Meta-Analysis of Efficacy and Safety

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Abstract

Background
Post-stroke seizure (PSS), particularly post-stroke epilepsy (PSE) was associated with increased mortality and disability in stroke patients. Statins were widely used as preventive measure against stroke and several studies showed that statin used was associated with a reduced risk of PSS. The aim of this meta-analysis was to evaluate how statin use affect both the efficacy and safety outcomes related to PSS and PSE.

Method
A systematic review and meta-analysis following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was conducted across multiple databases for cohort studies involving adult stroke patients treated with statin for PSS or PSE for prevention. Meta-analysis was conducted with Review Manager 5.4.

Results
A total of 5 articles that met our inclusion criteria were included. Statin use was associated with a lower risk of PSS or PSE (OR 0.68, 95%CI 0.57-0.82; p <0.002). From the five articles, no side effects of statin administration in patients with PSS or PSE were reported.

Discussion
Statins improved the integrity of the blood–brain barrier by reducing inflammatory responses and acting as neuroprotective agents, which could decrease the risk of stroke progressing to PSS or PSE. They were able to protect cortical GABAergic neurons and maintaining inhibitory effects on neural stimulation during cerebral ischemia. Additionally, statins reduced gliosis, thereby helping to prevent the development of PSS or PSE.

Conclusion
Statins were shown to be statistically associated with a decreased incidence of PSS or PSE without significant adverse effects.

Keywords: statin, post-stroke epilepsy, seizure, stroke

ID_107 Case Report / Neuro-Infection

Asterixis and Encephalitis: Rare Neurological Manifestations Found in Weil's Disease

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Abstract

Background

Weil's disease represents a severe form of leptospiral infection that may be life-threatening. Neurological manifestations are uncommon, and currently there are no established guidelines regarding the optimal management of these complications.

Case Summary

A 49-year-old man presented to the emergency department with a four-day history of sudden-onset headache with fever and nausea. He had worked as a farmer for 15 years. On admission, the patient was compos mentis, and physical examination was unremarkable. Initial laboratory evaluation revealed mild thrombocytopenia and slightly elevated urea and creatinine levels. During the first day of hospitalization, the patient developed oliguria. Further laboratory tests demonstrated normal electrolyte, total bilirubin and liver function levels, but serologic testing was positive for IgM leptospira, marking diagnosis of leptospirosis. Despite aggressive rehydration and antibiotic therapy, renal function deteriorated and hemodialysis was initiated. On the fifth day, the patient developed decreased consciousness without focal neurological deficits. Subsequent examination revealed nuchal rigidity and flapping tremors on both hands everytime we extended patient's arms. Brain CT scan suggested encephalitis. The clinical picture was consistent with inflammatory meningoencephalitis secondary to Weil's disease. The patient's condition progressively worsened, and he died on the thirteenth day of hospitalization.

Discussion

Bilateral asterixis may occur in metabolic encephalopathy; however, the encephalitis observed in this case may represent a second, immune-mediated phase following resolution of the initial infection.

Conclusion

Asterixis and encephalitis are rare manifestations that can be found in Weil's disease. Further researches and reports are needed to get better approach and to choose best treatment for such cases.

Keywords: asterixis, weil's disease, encephalitis, case report, neuroleptospirosis

ID_108 Research / Other

After-Dark Devices, Before-Dawn Disturbance: Screen Time and Sleep Quality among Adolescents in Manado, Indonesia

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Abstract

Background
Sleep disruption among urban adolescents is increasingly attributed to evening screen exposure, which suppresses melatonin via blue light emission. Despite global evidence, data from Indonesian cities remain sparse. This study examined the correlation between nighttime screen time and sleep quality among adolescents in Manado, North Sulawesi.

Method
A cross-sectional study was conducted among high school students aged 15–17 years in Manado. Participants completed the Indonesian version of the Pittsburgh Sleep Quality Index (PSQI) and reported average nightly screen time (categorized: none to >4 hours). Exclusion criteria included non-users of electronic devices. Spearman's correlation analyzed the relationship between screen time and PSQI global score.

Results
Among 108 eligible participants (55.6% female; median age 16 years), 62.0% demonstrated poor sleep quality (PSQI interpretation >5). Screen time showed a significant moderate positive correlation with PSQI score ($r = 0.38$, $p < 0.001$), independent of age and sex. Adolescents reporting >4 hours of nightly screen use exhibited the highest PSQI scores.

Discussion
The results indicate a significant association between longer screen time and poorer sleep quality due to melatonin suppression from blue light emitted by digital screens. A study conducted in China, Thailand, and Malaysia also found a similar association among adolescents. However, this study could not exclude the possibility of circadian rhythm disorders among adolescents.

Conclusion
Excessive screen time may negatively affect sleep quality among urban Manadonese adolescents. These findings underscore the need for sleep hygiene interventions addressing nighttime device use in this population.

Keywords: Screen Time, Sleep Quality, Adolescents, PSQI, Indonesia

ID_109 Case Report / Neuro-Vascular

Fluctuating Neurological Deficits in Severe Proximal Basilar Artery Stenosis: Conservative Management or Endovascular Angioplasty?

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Abstract

Background
Symptomatic basilar artery (BA) stenosis is a high-risk cause of posterior circulation ischemia with potential for recurrent events despite optimal medical therapy. The decision between conservative treatment and endovascular angioplasty remains challenging, particularly in patients with fluctuating symptoms.

Case Summary
A 62-year-old man with hypertension, poorly controlled type 2 diabetes mellitus, and prior ischemic stroke presented with a two-month history of oscillopsia, intermittent headache, and transient left-sided weakness. Symptoms progressed to persistent imbalance, diplopia, and gait instability. Brain imaging demonstrated acute infarctions in the left thalamus and right anterior pons, multiple chronic posterior circulation infarcts, occlusion of the right vertebral artery, and severe proximal BA stenosis. Digital subtraction angiography (DSA) confirmed approximately 90% symptomatic proximal BA stenosis with reduced flow to the right anterior inferior cerebellar artery. Despite anticoagulation, statin therapy, and risk factor control, the patient continued to experience symptoms that significantly interfered with daily activities. Given the high procedural risk, conservative management was chosen with close monitoring. A three-month observation period with repeat DSA was planned to reassess vascular status and determine the need for angioplasty.

Discussion
This case highlights the unstable course of severe BA stenosis despite medical therapy. Although angioplasty may improve perfusion, BA interventions carry substantial risk due to brainstem perforators, with perforator infarction from "snow-plow" effect during angioplasty being a major concern, particularly in proximal lesions.

Conclusion
Severe symptomatic BA stenosis presents a challenging therapeutic dilemma. Short-term observation with planned reassessment may be appropriate, but progressive symptoms require close follow-up and early consideration of endovascular treatment.

Keywords: Atherosclerosis, basilar artery stenosis, conservative management, endovascular angioplasty

ID_110 Research / Neuro-Vascular

Descriptive Analysis of Demographic and Door-to-Needle Time on Hyperacute Neurological Dynamics Post-Intravenous Thrombolysis

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Abstract

Background

The 24-hour NIHSS scores are standard prognostic markers, neurological dynamics during the "hyperacute phase" (first hour post-thrombolysis) are critical early indicators of successful reperfusion and long-term independence in Acute Ischemic Stroke (AIS).

Method

This observational study evaluated the impact of gender, age, and arrival time on hyperacute NIHSS dynamics following intravenous rt-PA. Data included 58 AIS patients (NIHSS ≥ 3, onset < 6 hours) at M. Hatta Brain Hospital (July 2024–June 2025). Outcomes at one-hour post-bolus were "Good" (NIHSS reduction ≥2) or "Poor" (reduction < 2).

Results

Overall, 75.9% achieved a Good Outcome. Good outcomes were most prevalent in the 45-64 age group (25/44), while poor outcomes were highest in the 65-75 group (7/14). Males had higher baseline severity (7.94 vs. 7.04) and more Good Outcomes (78.8% vs. 72.0%), though females averaged a greater NIHSS reduction (3.0 vs. 2.88). Most patients (77.6%) arrived within the ≥ 3-hour window.

Discussion

Biological recovery potential post-thrombolysis is relatively equal across demographics. The hyperacute NIHSS response reflects early recanalization, emphasizing that rapid intervention, not demographics, drives success.

Conclusion

IV thrombolysis is highly effective regardless of age or gender. Protocols must prioritize reducing door-to-needle time over demographic-based exclusions.

Keywords: Acute Ischemic Stroke; Thrombolytic Therapy, NIHSS, Demographic Factors, Door-to-Needle.

ID_111 Case Report /
Neurophysiology (Peripheral Nerve & Neuromuscular)

Delayed Recognition of Myasthenic Crisis Presenting as Community-Acquired Pneumonia Leading to Respiratory Failure: A Case Report

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Abstract

Background

Myasthenia gravis (MG) is an autoimmune neuromuscular disorder characterized by fluctuating skeletal muscle weakness due to impaired neuromuscular transmission. One of its most serious complications is myasthenic crisis, a life-threatening condition caused by severe respiratory muscle weakness leading to respiratory failure that requires mechanical ventilation. Respiratory infections, including community-acquired pneumonia (CAP), are among the most common triggers and may complicate the clinical diagnosis.

Case Summary

A 61-year-old woman with a recent history of myasthenia gravis presented with acute dyspnea and generalized weakness. Initial clinical evaluation suggested community-acquired pneumonia. although the initial chest radiograph showed no significant abnormalities. During hospitalization, the patient developed rapid clinical deterioration characterized by worsening dyspnea, severe hypercapnia, respiratory acidosis, and decreased level of consciousness, requiring endotracheal intubation and mechanical ventilation. Due to prolonged ventilator dependence, a tracheostomy was performed. Further evaluation suggested a myasthenic crisis triggered by infection.

Discussion

This case highlights the diagnostic challenge in differentiating pulmonary infection from neuromuscular respiratory failure in patients with MG. Delayed recognition of myasthenic crisis may result in severe respiratory compromise and prolonged intensive care management.

Conclusion

Early recognition of respiratory muscle weakness and close respiratory monitoring are crucial in MG patients presenting with dyspnea. Maintaining a high clinical suspicion for myasthenic crisis can facilitate timely diagnosis and management, potentially preventing severe complications and reducing morbidity.

Keywords: myasthenia gravis, myasthenic crisis, respiratory failure, community-acquired pneumonia, delayed recognition.

ID_112 Research / Neuro-Behavior

CENTRAL NERVOUS SYSTEM MEDICATIONS AS MODIFIABLE RISK FACTORS FOR DELIRIUM IN HOSPITALIZED PATIENTS: A SYSTEMATIC REVIEW

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Abstract

Background
Delirium is an acute neurological syndrome characterized by disturbances in attention, awareness, and cognition due to sudden brain dysfunction. It commonly occurs in hospitalized patients and is associated with increased mortality and prolonged hospital stays. Delirium is multifactorial and may be triggered by conditions such as infection, metabolic disturbances, hypoxia, and the use of medications affecting the central nervous system, which represents potentially modifiable risk factors.

Method
This study was conducted as a systematic review to evaluate the association between central nervous system medications and the occurrence of delirium. Literature searches were performed in PubMed, Google Scholar, the Cochrane Library, and the Directory of Open Access Journals (DOAJ). A total of 219 articles were identified, and after applying the inclusion and exclusion criteria, 15 studies were included in the final analysis.

Results
The analyzed studies showed that benzodiazepines were the medication class most consistently associated with an increased risk of delirium across multiple studies, while the relationship between opioid use and delirium showed heterogeneous findings.

Discussion
These findings suggest that medications affecting the central nervous system may contribute to delirium through alterations in neurotransmitter balance and cognitive function.

Conclusion
Several central nervous system medications are associated with an increased risk of delirium in hospitalized patients. Careful evaluation of medication use may play an important role in delirium prevention.

Keywords: Delirium, Drug-Related, Hospitalized Patients, Central Nervous System Agents

ID_113 Case Report / Neuro-Immunology

Recurrent Respiratory Failure in a Myasthenic Crisis Complicated by Pneumonia

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Abstract

Background

Myasthenia gravis (MG) is a rare autoimmune disease occurs due to the presence of antibodies that attack the postsynaptic membrane at the neuromuscular junction, whereas a myasthenic crisis is a neurological emergency resulting from life-threatening respiratory failure. MG patients are highly susceptible to pneumonia due to immunosuppressive therapy and the risk of aspiration, leading to recurrent respiratory failure with a high mortality rate.

Case Summary

We report the case of a 61-year-old man with a history of myasthenia gravis who presented with complaints of difficulty swallowing and shortness of breath that progressively worsened, leading to respiratory failure and subsequent intubation. During his hospitalization, the patient received two cycles of Therapeutic Plasma Exchange (TPE) and was given empirical antibiotics for pneumonia, his clinical condition improved, and he was extubated. Within 24 hours, the patient experienced leading to recurrent respiratory failure and re-intubation. The patient underwent another 2 cycles of TPE and was administered antibiotics based on culture results.

Discussion

The recurrent respiratory failure observed in this patient was caused by myasthenic crisis, which was further complicated by pneumonia. TPE is the recommended immunotherapy because it directly removes acetylcholine receptor (AChR) antibodies; treatment for the pneumonia is based on the results of culture test.

Conclusion

Pneumonia and myasthenic crisis are interrelated because pneumonia can trigger a myasthenic crisis, and myasthenia can also lead to pneumonia.

Keywords: Myasthenia Gravis, Myasthenic Crisis, Therapeutic Plasma Exchange

ID_114 Research / Movement Disorder

Mortality Rate in Patients with Parkinsonism: a Five-Year Longitudinal Study at Tertiary National Hospital

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Abstract

Background

Parkinsonism, comprising Parkinson's disease (PD) and atypical parkinsonism, is increasingly prevalent worldwide, yet data on survival and prognostic factors in Indonesia are limited. This study aimed to determine the fiveyear survival rate and mortalityassociated factors in patients with parkinsonism at Dr. Cipto Mangunkusumo Hospital.

Method

We conducted a retrospective cohort study of patients with parkinsonism who visited the Neurology Department of RSCM between 2021 and 2025 and were followed for up to five years. Cox proportional hazards models were applied to explore associations among age at onset, disease severity, parkinsonism subtype, and survival.

Results

A total of 107 patients with Parkinsonism were included, consisting of 57 (53%) samples with PD and 50 (47%) samples with atypical Parkinsonism. The 5-year mortality rate of parkinsonism is 12.1%. The mean of disease duration among the deceased patients was 3.46 ± 2.37 (95% confidence interval (CI) 2.175-4.748). On univariate Cox regression analysis, older age at onset (hazard ratio (HR) 2.5, 95% CI 0.298–21.088), severe stage at diagnosis (HR 2.745, 95% CI 0.305–24.685), and atypical parkinsonism (HR 1.375, 95% CI 0.282–6.712) were associated with reduced survival.

Discussion

Older age of onset may increase mortality due to reduced physiological reserve and comorbidities, while the advanced stage reflects a more complex neurodegeneration process. In addition, atypical parkinsonism generally follows a more aggressive course.

Conclusion

These findings highlight the need for early identification and closer monitoring of patients with older age at onset, advanced stage, and atypical parkinsonism to optimize longterm management.

Keywords: Parkinsonism; Parkinson's disease; survival; prognosis; mortality; Indonesia

ID_117 Research / Movement Disorder

Wrist-Worn Nerve Stimulation for Essential Tremor: A Systematic Review of Randomized Controlled Trial

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Abstract

Background
Essential tremor (ET) is one of the most prevalent debilitating nerve-related movement disorder. Peripheral nerve stimulation (PNS) emerges as noninvasive and nonpharmacological approach for ET. This study aims to evaluate the efficacy and safety of transcutaneous PNS for ET.

Method
Databases were searched utilizing guidelines by Preferred reporting items for systematic reviews and meta-analyses (PRISMA). This review analyzed studies focusing on efficacy, safety and QoL outcomes, restricted only to randomized controlled trial (RCT) type of study. Quality of the study is assessed using Cochrane Risk of Bias (RoB 2).

Results
Three RCT involving 290 patients were included in this study. Improvement of activities daily living (ADL) score in treatment group were found in two RCTs (n=202). In one single center RCT (n=88), PNS improve tremor amplitude but arm tremor severity and ADL score revealed no significant improvement compared to sham. Most common adverse event was skin irritation, which is mild and resolve immediately.

Discussion
Drug therapy for ET is often unsatisfactory and lose effectiveness overtime. Surgical approach that targeting the ventral intermediate nucleus of the thalamus (VIM) as the central tremor network are highly effective but considered invasive. Current studies showed that transcutaneous PNS may have potential benefits for treating ET. Median and ulnar nerve stimulation may modulate VIM, thus mitigates ET symptoms. More data is needed due to inconsistent results within the RCTs.

Conclusion
Transcutaneous PNS may provide non-invasive and safe therapy approach for ET, but further research is needed for implementing PNS in clinical practice.

Keywords: transcutaneous peripheral nerve stimulation; essential tremor; action tremor

ID_118 Research / Neuro-Restoration

Effects of Transcranial Direct Current Stimulation on Executive Functions in Children With Autism Spectrum Disorder: A Systematic Review of Randomized Trials

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Abstract

Background
Executive function (EF) deficits in children with autism spectrum disorder (ASD) significantly impact independence. Transcranial direct current stimulation (tDCS) is a promising neuromodulation technique aimed at improving EF by restoring excitatory–inhibitory (E/I) balance in the prefrontal cortex. This systematic review evaluates the effectiveness and safety of tDCS for enhancing EF in children with ASD.

Method
Following PRISMA guidelines, we searched PubMed, Cochrane Library, and Europe PMC up to March 2026 for randomized controlled trials (RCTs) published in the last decade involving children (≤18 years). Risk of bias was assessed using Cochrane RoB 2. Primary outcomes included standardized EF scales (e.g., BRIEF), behavioral assessments (CARS, ABC), and neurophysiological data (EEG and fNIRS). Secondary outcomes included tDCS stimulation parameters and adverse events.

Results
Five RCTs (N=202) were included. Most studies utilized 1–2 mA sessions (15–20 minutes, 8–20 sessions) targeting the dorsolateral prefrontal cortex. tDCS significantly improved inhibitory control, sustained attention, and social responsiveness. Cognitive flexibility and planning improvements were comparable to conventional therapy. Neurophysiological data suggested increased cortical activation and normalized E/I balance. Adverse effects were mild and transient, primarily scalp erythema.

Discussion
Findings suggest that tDCS enhances EF by modulating prefrontal cortical networks. The neurophysiological evidence of increased activation supports the role of tDCS in facilitating neuroplasticity. The benefits appear greater when combined with behavioral training, indicating a synergistic effect where tDCS serves as a potent "optimizer" for existing therapies.

Conclusion
tDCS is a safe and promising adjunctive intervention for improving EF in children with ASD. Larger trials are required to standardize protocols and determine long-term efficacy.

Keywords: transcranial direct current stimulation (tDCS), autism spectrum disorder (ASD), executive function (EF), Neuroplasticity, Prefrontal cortex.

ID_121 Research / Neuro-Pediatric

Seizure Reduction and Global Clinical Improvement with Fenfluramine in Drug-Resistant Pediatric Epilepsy: A Meta-Analysis of Randomized Controlled Trials

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Abstract

Background
Drug-resistant epilepsy (DRE) affects up to 40% of children, causing persistent seizures, developmental challenges, and reduced quality of life. Fenfluramine (FFA) shows potential to reduce seizures and improve daily functioning, but pediatric-specific outcomes remain limited.

Method
This systematic review and meta-analysis was conducted according to PRISMA 2020 guidelines. Outcomes included ≥25%, ≥50%, ≥75%, and 100% seizure reduction, longest convulsive seizure-free interval (LCSFI), and Clinical Global Impression of Improvement (CGI-I). Random-effects meta-analysis was performed using Review Manager 5.4.

Results
Three RCTs involving 348 pediatric patients were included. FFA significantly increased responder rates across all seizure reduction thresholds: ≥25% (OR 2.17, 95% CI 1.56–3.02), ≥50% (OR 6.24, 95% CI 3.76–10.36), and ≥75% reduction (OR 10.91, 95% CI 5.14–23.14), all p<0.00001. Seizure freedom (OR 6.96, 95% CI 1.58–30.63, p=0.01). p<0.00001) and longer seizure-free intervals (MD 0.88 days, p<0.00001) obtained by FFA. CGI-I responses were higher, both by investigators (OR 4.50, 95% CI 2.98–6.79) and caregivers (OR 3.87, 95% CI 2.13–7.02).

Discussion
Fenfluramine significantly improved seizure responder rates and seizure-free intervals in pediatric DRE, with progressively larger effect sizes at higher responder thresholds. Its serotonergic modulation may enhance inhibitory signaling in hyperexcitable developmental epilepsy networks, while concordant CGI-I ratings indicate meaningful functional improvement beyond seizure reduction.

Conclusion
Fenfluramine provides clinically meaningful seizure control and functional improvement in pediatric drug-resistant epilepsy, highlighting its potential as an adjunctive therapy for severe developmental epilepsies.

Keywords: Pediatric, Drug-resistant epilepsy, Fenfluramine, Seizure Reduction, Seizure Freedom

ID_123 Case Report / Neuro-Vascular

Sudden Unexpected Death of Young Adult Due to Subarachnoid Hemorrhage Associated with Aneurysm Rupture : A Case Report

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Abstract

Background
Subarachnoid hemorrhage (SAH) is a dangerous neurological disorder with sudden onset and mostly without any premonitory warnings. The main symptom of a SAH is a thunderclap headache, which is a very intense and painful headache that comes on suddenly. The most common cause of non-traumatic SAH is intracranial aneurysm.

Case Summary
A 30-years old man was transferred to emergency room after presenting the worst headache of his life, causing him to fall from standing due to severity. He denied any alleviating or aggravating factors. Headache followed with nausea, vomiting, and photophobia. On physical examination showed in normal range without neurological deficits when he arrived, but the next fifteen minutes he lost consciousness. The laboratory found leukocytosis with 27600/uL. On head CT-Scan without contrast showed diffused SAH and suggested to be transferred to bigger hospital for CT angiography. He received intravenous tranexamic acid and vitamin K to reduce the rebleeding before transferring the patient. The man's condition reportedly worsened in ICU and died the day after.

Discussion
Non-traumatic SAH mostly caused by intracranial aneurysm rupture. The most common type of aneurysm is saccular aneurysm which located in anterior circulation (85%) and posterior circulation (15%). Neurological imaging is the main examination to diagnose SAH. The patient head CT-Scan showed Fisher Scale Grade IV with IVH, and The Hunt & Hess Scale 4.

Conclusion
Thunderclap headache is one of the most common symptom of SAH. The major cause of SAH is ruptured intracranial aneurysm. The diagnosis is mainly confirmed by neuroimaging. Treatment is primarily to prevent rebleeding and other complications.

Keywords: Subarachnoid Hemorrhage, Aneurysm, Headache

ID_124 Research / Neuro-Vascular

Clinical Profile and Management of Hemorrhagic Stroke in Polycythemia Vera: A Scoping Review

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Abstract

Background
Polycythemia vera (PV) is a myeloproliferative neoplasm primarily associated with arterial and venous thrombosis due to hyperviscosity. Although PV is often associated with prothrombotic states, hemorrhagic stroke is a rare complication leading to a gap of evidence and clinical dilemma regarding optimal management. This scoping review aims to map the clinical features, laboratory profiles, and management strategies of hemorrhagic stroke in patients with PV.

Method
Following JBI methodology and PRISMA-ScR guidelines, a systematic search was conducted across PubMed, EBSCOhost, Scopus, and ScienceDirect. From 72 identified records, five case reports met inclusion criteria for final data synthesis after screening.

Results
The five included cases involved patients aged 50–76 years, mostly female. Laboratory findings at the time of stroke typically showed high hematocrit (up to 74%) and thrombocytosis, one case occurred in the late myelofibrosis stage with thrombocytopenia. Hemorrhagic manifestations included spontaneous intracerebral, subarachnoid hemorrhage, and hemorrhagic transformation of ischemic infarcts. Primary mechanisms were identified with hyperviscosity-induced stasis, endothelial damage, and platelet dysfunction, including acquired von Willebrand disease. Management focused on rapid cytoreduction, red cell apheresis, or hydroxyurea (1000–2000 mg/day), alongside blood pressure control. Surgical intervention was reported in one case. All patients showed clinical improvement post-intervention.

Discussion
The findings highlight a therapeutic dilemma in PV-related hemorrhagic stroke, where the need for cytoreduction must be balanced against impaired hemostasis. Significant heterogeneity exists in clinical presentation, reflecting the rarity of the condition and the lack of standardized treatment protocols.

Conclusion
Aggressive management of hematological parameters is essential for treating PV-related hemorrhagic stroke. Further research is required to optimize therapeutic guidelines.

Keywords: Polycythemia Vera, Hemorrhagic Stroke, Intracerebral Hemorrhage, Clinical Profile, Management, Scoping Review

ID_125 Case Report / Neurophysiology (Epilepsy)

Neuropsychiatric Comorbidities in Drug-Resistent Epilepsy : A Clinical Challenge

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Abstract

Background

Epilepsy is associated with complex comorbidities, including psychiatric disorders reciprocal in nature. Epilepsy with psychiatric comorbidity may develop drug resistance, negatively affecting quality of life and prognosis.

Case Summary

A 18 year old women with recurrent seizures since age 5. Tonic-clonic seizures, unconscious during seizures, conscious after seizures. Sometimes experiencing auditory, visual hallucinations followed by jerking of both hands, the patient is conscious, and triggered by emotional stress. Interictal EEG results: epileptiform spike-wave activity dominant in the right frontal region, bilateral fronto-temporal slowing. Valproic acid 2x750 mg obtained postural and resting tremors. Changing medication to phenytoin 2x200 mg resulted gait ataxia and gingival enlargement. Combination of Carbamazepine 3x400 mg, Gabapentin 2x300 mg, Levetiracetam 2x500 mg, Clobazam 3x10 mg, Psychiatric Consultation, given Risperidone 2x1 mg, Fluoxetine 1x20 mg at night, showed clinical improvement after 1 month evaluation.

Discussion

Epilepsy with psychiatric comorbidity, valproic acid >750 mg/day may cause postural and resting tremor. Phenytoin may cause gait ataxia and gingival enlargement within 2–3 months. Combination therapy with carbamazepine, gabapentin, and levetiracetam is used for tonic-clonic seizures, with clobazam as add-on in drug-resistant epilepsy. Psychiatric evaluation supports screening and management. Risperidone is first-line for first-episode psychosis. Fluoxetine has minimal effect on seizure threshold. Combined Antiseizure Medications (ASM) and antipsychotic therapy helps control seizures and psychiatric symptoms.

Conclusion

Psychiatric comorbidity in epilepsy is complex and reciprocal. Drug-resistant epilepsy may occur, affecting quality of life and prognosis. Management requires multidisciplinary care, appropriate combination ASM, antipsychotic therapy, monitoring of adverse effects and drug interactions.

Keywords: Epilepsy, Neuropsychiatric Comorbidity, Drug-Resistant Epilepsy, Antiseizure Medications

ID_126 Research / Neurophysiology (Epilepsy)

Non-Invasive Brain Stimulation for Drug-Resistant Epilepsy: Evidence from a Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Abstract

Background

Approximately, one-third of patients with epilepsy develop drug-resistant epilepsy (DRE), representing a major therapeutic challenge. Non-invasive brain stimulation (NIBS) has emerged as a promising neuromodulation strategy for seizure control. However, its efficacy and safety remain trivial.

Method

A study evaluating NIBS in DRE patients was conducted following PRISMA guidelines. Eligible studies included DRE patients. Primary outcomes were responder rate (RR) and seizure reduction (SR). Secondary outcomes included quality of life (QoL) and adverse events (AE). Pooled effect estimates were calculated using random-effects models.

Results

Nine studies involving 246 patients were included. Meta-analysis demonstrated significant seizure reduction with tDCS at week 4 (MD=-44.39%, 95% CI -62.16 to -26.61; p<0.00001) and TMS at week 12 (MD=-13.32, 95% CI -17.04 to -9.61; p<0.00001). TMS also significantly improved responder rate at week 4 (OR=36.17, 95% CI 3.97–329.24; p=0.001) rather than week 8. Evidence for tVNS, tACS, and TNS remains limited due to small sample sizes. Improvements in QoL were reported across studies, and no serious AE were identified.

Discussion

TMS improves patients' response and reduces seizure frequency significantly, whereas tDCS benefits the latter. The remaining shows promising results. Although encouraging, these findings should be interpreted attentively.

Conclusion

NIBS, particularly tDCS and TMS, show promising results in reducing seizure burden among DRE patients. These findings support the growing role of NIBS as adjunctive therapy in DRE. Larger randomized trials are required to determine optimal protocols and long-term outcomes.

Keywords: drug-resistant epilepsy, non-invasive brain stimulation, transcranial magnetic stimulation, transcranial direct current stimulation

ID_127 Case Report / Neurophysiology (Epilepsy)

Juvenile Absence Epilepsy Exacerbated by Carbamazepine

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Abstract

Background

Carbamazepine (CBZ) is an effective antiepileptic drug (AED) in managing partial and generalized tonic-clonic seizure. Despite its efficacy, CBZ has been reported to exacerbate seizures, including absence seizure. Here, we describe a case of juvenile absence epilepsy (JAE) exacerbated by CBZ.

Case Summary

A 17-year-old male, presented to the hospital with frequent absence seizures with history of tonic-clonic seizures for years. Previously he was routinely administered divalproex sodium, clobazam, and CBZ, but had absence seizure almost every day for the past 1 year. Electroencephalography (EEG) shows 4-5 Hz generalized poly spike-wave. Then CBZ was discontinued. After 3 months of follow-up, the patient had one absence seizure.

Discussion

AEDs may cause a paradoxical worsening seizure, new seizure types, or exacerbate existing ones. Sodium channel blocker drugs, specifically carbamazepine, are known to exacerbate absence seizures. However, the mechanism is not well understood. Absence seizures are thought to be caused by loss of inhibition in inhibitory gamma-aminobutyric acid (GABA)-ergic reticular thalamic neurons. Several studies have hypothesized that carbamazepine might exert action on these inhibitory networks. Studies determined that carbamazepine selectively and dose-dependently inhibited firing of thalamic reticular neurons, reduced GABAergic transmission at thalamic reticular synapses onto thalamocortical neurons, and reduced action potential firing from thalamic reticular neurons in Scn8a haploinsufficient mutant (Scn8amed/+) mice.

Conclusion

In patients with atypical presentation, diagnosing epilepsy and selection of therapy might be difficult. This report shows such a difficulty describing a case of CBZ-induced seizure exacerbation in a patient with JAE.

Keywords: carbamazepine, exacerbation, absence

ID_128 Case Report / Neuro-Restoration

Transcranial Direct Current Stimulation As an Adjunctive Therapy For Pharmacotherapy Refractory Chronic Motor Tic: A Case Report

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Abstract

Background

Chronic motor tic is characterized by sudden, rapid, recurrent, nonrhythmic movements associated with dysfunction of the striato-thalamo-cortical network. Pharmacotherapy remains the main treatment but some patients show limited response or develop adverse effects that limit dose optimization. Transcranial direct current stimulation (tDCS) is a noninvasive neuromodulation technique that modulates cortical excitability and may provide therapeutic benefit in tic disorders.

Case Summary

A 13-year-old boy presented with a six-year history of involuntary oromandibular deviation and leftward neck rotation occurring during speech or stressful situations such as answering questions at school. Symptoms were partially reduced when chewing gum. Brain magnetic resonance imaging and electroencephalography were normal. Previous treatments including haloperidol, clonazepam, and trihexyphenidyl showed no improvement. Clonidine produced partial benefit but dose escalation caused nausea and dizziness. Tic frequency reached approximately sixty episodes per day. The patient received adjunctive tDCS combined with low-dose clonidine and aripiprazole. Stimulation was delivered twice weekly with an anode over the left dorsolateral prefrontal cortex and a cathode over the right hemisphere. After eighteen sessions, tic frequency decreased to approximately fifteen episodes per day with occasional tic-free days and improved speech fluency.

Discussion

tDCS may enhance cortical inhibitory modulation by altering neuronal membrane potentials and synaptic plasticity. Anodal stimulation over the dorsolateral prefrontal cortex may strengthen executive control over motor networks and improve suppression of involuntary movements. Repeated stimulation sessions may also induce neuroplastic changes that contribute to sustained clinical improvement.

Conclusion

tDCS may represent a promising adjunctive therapy for chronic motor tic with inadequate response to pharmacological treatment.

Keywords: Chronic motor tic, Transcranial direct current stimulation, Neuromodulation, Tic disorder

ID_129 Research / Neuro-Infection

Association Between Mean Platelet Volume (MPV) And Platelet Ratio (MPV/PLT) In Differentiating Bacterial Meningitis From Tuberculous Meningitis

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Abstract

Background
The early differentiation between bacterial meningitis (BM) from tuberculous meningitis (TBM) is essential for management strategies and clinical outcomes. The main problems are no good diagnostic rapid test is available. The Mean Platelet Volume (MPV)-to-platelet ratio has been reported to reflect inflammatory activity in various infectious diseases. The aims of this study was evaluate the role of the MPV-to-platelet ratio in differentiating BM from TBM.

Method
The retrospective study approach using medical record data included 28 patients with confirmed diagnosis of meningitis who were admitted to the RSUP dr. Kariadi Semarang between January 2022 until December 2025. The data of MPV-to-platelet ratio was analyzed by Mann Whitney Test.

Results
A total of 28 patients met the inclusion criteria, including 15 with BM and 13 with TBM. The median MPV/PLT ratios were statistically higher in BM patients than TBM patients (0,029 vs 0.028, p=0.036). The AUC value for MPV/PLT ratio was 0.541, with a 0.029 cut-off value having a sensitivity of 53,3% and a specificity of 53,8%.

Discussion
MPV reflects platelet size and activation status, while platelet count reflects platelet production and peripheral consumption during inflammation. The pathogenesis of TBM is slower progression of inflammation and different immune pathways may lead to distinct patterns of platelet activation and turnover compared with BM. This study had several limitations, including its retrospective design, performance at a single center and small sample size.

Conclusion
MPV/PLT ratio has diagnostic value in differentiating between BM from TBM. Further large-scale, prospective studies are necessary for validation.

Keywords: meningitis,mean platelet volume,inflammation, platelets

ID_130 Research / Neuro-Infection

Diagnosis Of Tuberculous Meningitis (TBM) : Descriptive Study in Adult Patients Using Marais Criteria

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Abstract

Background
Tuberculous meningitis (TBM) is a severe form of tuberculosis with high morbidity and mortality, and its early diagnosis is challenging due to the low sensitivity of CSF microbiological tests. The Marais criteria were developed to improve diagnostic accuracy by combining clinical, laboratory, and radiological findings.

Method
A retrospective descriptive study was conducted on 46 adult TBM patients. Data included clinical criteria, CSF findings, brain imaging, and evidence of tuberculosis elsewhere, with diagnoses classified as probable or possible TBM using the Marais criteria.

Results
Fever (91.3%), headache (84.8%), and neck stiffness (71.7%) were the most common symptoms. Neurological deficits occurred in 87% of patients and decreased consciousness in 67.4%. Based on the Marais criteria, 76% were classified as probable TBM and 23% as possible TBM. Significant associations were found with CSF criteria and cerebral imaging, but not with clinical criteria or evidence of tuberculosis elsewhere.

Discussion
The criteria for defining MTB cases according to Marais state that the determination of the MTB diagnosis score can indeed be carried out if there are at least results from a CSS examination or a CT scan of the head with contrast. Thus, the determination of the MTB diagnosis score can still be done even if a CSS examination is not conducted. In this study, there were no patients who fell into the definitive diagnosis classification.

Conclusion
The Marais criteria are useful in supporting the diagnosis of TBM in adult patients. CSF findings and cerebral imaging play an important role in improving diagnostic accuracy.

Keywords: Tuberculous meningitis, Marais criteria, cerebrospinal fluid, brain imaging, diagnosis.

ID_132 Case Report / Neuro-Vascular

Cervical Spasm in Disguise: A Case of Intracranial Hemorrhage due to Cerebral Venous Thrombosis in a Female on Oral Contraceptives

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Abstract

Background

Cerebral venous thrombosis (CVT) is a rare and potentially life-threatening cause of stroke, accounting for an incidence of 0.5% from all strokes. About one-third of CVT cases present with intracerebral hemorrhage (ICH). Predisposing factors include inherited thrombophilia and acquired hypercoagulable state. Comprehensive history taking and high clinical suspicion must be established to successfully diagnose CVT, especially in this case.

Case Summary

A 48-year-old female presents with headache, nausea, and vomiting a day before admitted to hospital. She has a history of uterine leiomyoma and was on oral contraceptive pills for 6 months. After three days of treatment, symptoms of headache and nausea did not resolve. Non-contrast brain computed tomography (CT) displayed an ICH in the left temporo-parieto-occipital lobe. Subsequently, magnetic resonance venography (MRV) was ordered and revealed a thrombus in the left transverse-sigmoid sinus. The patient was treated with anticoagulation and symptoms resolved gradually.

Discussion

Females presenting with headache, nausea, vomiting and oral contraceptive usage must raise a high clinical suspicion of CVT. Brain MRV is the diagnostic gold standard as it revealed the cause of ICH and presenting symptoms. Anticoagulation is the mainstay treatment despite the presence of ICH.

Conclusion

Early identification with MRV is essential to prevent mortality and shorten the length of stay (LOS) in hospital. Thorough history taking and risk factor management is quintessential for treatment.

Keywords: anticoagulation, cerebral venous thrombosis, cervical spasm, hypercoagulability, intracranial hemorrhage, magnetic resonance venography, oral contraceptive pills, stroke, thromboembolism.

ID_133 Case Report / Neuro-Oncology

Central Nervous System Extramedullary Relapse of Acute Myeloid Leukemia After Autologous Stem Cell Transplantation: A Case Report

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Abstract

Background
The central nervous system (CNS) is a recognized site of extramedullary relapse in acute myeloid leukemia (AML). Mass-forming intracranial leukemic infiltration is often described as myeloid sarcoma in the literature and is linked to poor patient prognosis.

Case Summary
A 31-year-old male initially diagnosed with AML in December 2024 had undergone autologous hematopoietic stem cell transplant (HSCT) in October 2025, and was receiving midostaurin therapy. In early February 2026, he had escalating headaches with nausea, vomiting, and visual disturbance. Campimetry demonstrated left homonymous hemianopia with central sparing, localizing to a retrochiasmal lesion. Contrast-enhanced brain magnetic resonance imaging (MRI) revealed multiple nodular lesions and surrounding vasogenic edema in both occipital lobes, the left temporal lobe, and the left cerebellum. An evaluation MRI conducted 10 days afterwards revealed rapid enlargement with increasing edema, a 0.7 cm midline shift, and a new small left parietal lesion. A whole body fluorodeoxyglucose (FDG) positron emission tomography–computed tomography (PET-CT) scan revealed FDG-avid foci within the intracranial sites, without extracranial involvement. A biopsy was recommended for the patient, but was not pursued at the patient's and family's request to proceed with referral.

Discussion
In the context of post-autologous HSCT AML, rapid multifocal intracranial progression, along with CNS-limited PET-CT uptake, supported presumed extramedullary CNS relapse, despite the unavailability of histopathology confirmation.

Conclusion
Neurological deficits with progressively worsening headaches in AML patients prompt immediate neuroimaging and consideration of CNS extramedullary relapse. PET-CT may assist in confirming a CNS-confined diagnosis when extracranial involvement is not evident. Histopathology confirmation should be pursued when feasible.

Keywords: acute myeloid leukemia, central nervous system, extramedullary relapse, autologous stem cell transplantation, intracranial mass lesion

ID_134 Case Report / Neuro-Vascular

Silent Advanced Moyamoya Disease in an Asymptomatic Elderly Patient: A Rare Case Report

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Abstract

Background

Moyamoya disease (MMD) is a rare cerebrovascular disorder characterized by progressive steno-occlusive non atherosclerotic of the terminal internal carotid artery (ICA) and its major branches, leading to the formation of abnormal collateral vessels. The disease commonly presents with ischemic or hemorrhagic events. However asymptomatic MMD elderly patients is rare and may be detected incidentally.

Case Summary

A 77-year-old man presented to the neurology outpatient clinic for a routine health evaluation. He had a history of controlled hypertension and reported no neurological symptoms. Neurological examination showed no abnormalities. Brain magnetic resonance imaging (MRI) revealed occlusive of the M1 segment of the middle cerebral artery. Digital Subtraction Angiography (DSA) demonstrated total occlusion of the left middle cerebral artery (M1 segment) with collateral circulation from the anterior cerebral artery, posterior cerebral artery, and superficial temporal artery without delayed arterial filling, consistent with advanced moyamoya disease stage V–VI. The patient was managed conservatively with antiplatelet therapy, statin treatment, and control of vascular risk factors.

Discussion

The asymptomatic clinical presentation in advanced stages may be attributed to the presence of well-developed collateral circulation capable of maintaining adequate cerebral perfusion. This hemodynamic compensatory mechanism may allow some patients to remain free of neurological deficits despite occlusion of major cerebral arteries.

Conclusion

This case highlights that advanced moyamoya disease can remain clinically silent in elderly patients. Cerebrovascular imaging is essential for detecting occult vascular abnormalities and enabling appropriate monitoring to prevent future cerebrovascular complications.

Keywords: Moyamoya disease, cerebral collateral circulation, cerebrovascular disorder, stroke.

ID_135 Case Report / Neuro-Oncology

Giant Supratentorial Intracranial Tumor Mimicking Childhood Epilepsy: Diagnostic And Management Challenges In A Secondary Referral Hospital

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Abstract

Background
Intracranial tumors in children are often incidental findings. However, large tumors may present with seizures and focal neurological deficits. Delayed diagnosis may occur due to limited access to neuroimaging, referral constraints, and socioeconomic barriers.

Case Summary
A 7-year-old boy presented with progressive right-sided weakness, recurrent seizures, headache, and decreased level of consciousness. He had a history of seizures since early childhood and was previously diagnosed and treated as epilepsy without prior neuroimaging. Over the preceding three months, seizure frequency increased and motor impairment progressed. Clinical history was limited following recent loss of the primary caregiver. Non-contrast computed tomography (CT) scan of the brain revealed a large hypodense cystic lesion in the left temporoparietal region and causing a 1.7 cm midline shift. Due to neurological deterioration and delayed access to tertiary care, the patient underwent decompressive surgery at a secondary referral hospital, including cyst drainage via craniectomy and burr hole decompression without shunt. Histopathology showed a non-specific inflammatory cyst with no malignant evidence, although the clinical presentation raised suspicion for malignancy.

Discussion
This case demonstrates how large intracranial tumors may masquerade as epilepsy and highlights the importance of neuroimaging in children with seizures accompanied by focal deficits. Limited resources and socioeconomic factors contributed to delayed diagnosis and management. Although referral to a tertiary referral hospital was recommended, prompt and life-saving treatment must be prioritized based on clinical judgement.

Conclusion
Clinicians must remain vigilant and maintain a comprehensive diagnostic approach when treating pediatric patients with red flag features, particularly in limited-resources settings and referral barriers.

Keywords: intracranial tumors, supratentorial tumor, pediatric oncology

ID_136 Case Report / Other

Polysomnographic Characterization of Sleep-Related Breathing Dysfunction in Myasthenia Gravis: A Comparative Case Series on Complaints of Sensations of Drowning, and Nocturnal Dyspnea

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Abstract

Background

Sleep-disordered breathing in myasthenia gravis (MG), including hypoventilation, obstructive, central, and mixed apnea, is increasingly recognized; obstructive sleep apnea has been reported in up to 36% of patients. Respiratory and airway muscle fatigability may worsen during sleep, especially in REM, when physiologic atonia further impairs ventilation. This study compared polysomnographic (PSG) findings in two MG patients with nocturnal dyspnea and drowning sensation.

Case Summary

A 34-year-old woman had generalized weakness, ptosis, nocturnal drowning sensation, dyspnea, and recurrent awakening. She is diagnosed with MGFA Class IIA, refused thymectomy and received IVIg with pharmacologic therapy. PSG showed moderate sleep apnea (AHI 15.1), sleep quality 71%, and oxygen saturation 97%–83%. A 25-year-old woman had generalized weakness, ptosis, exertional dyspnea, snoring, and repeated awakening from shortness of breath. She is diagnosed with MGFA Class IIA underwent thymectomy and TPE with better clinical improvement. PSG showed moderate sleep apnea (AHI 21.8), sleep quality 70%, and oxygen saturation 95%–84%.

Discussion

PSG differentiates obstructive, central, and mixed apnea using airflow, respiratory effort, and oxygenation signals. In MG, nocturnal drowning sensation may reflect respiratory-muscle fatigability worsened by REM-related atonia, promoting hypoventilation or apnea. Poor sleep quality may worsen fatigue and quality of life. Definitive MG therapy may improve nocturnal respiratory dysfunction.

Conclusion

PSG identified sleep apnea and oxygen desaturation in both patients, supporting its value for detecting nocturnal respiratory involvement, guiding treatment and preventive measurement.

Keywords: myasthenia gravis; polysomnography; sleep apnea; breathing disorder

ID_139 Case Report / Neuro-Vascular

Acute Subdural Hematoma Following Spinal Anesthesia in Patient Undergoing Appendectomy: a Case Report

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Abstract

Background
Spinal anesthesia is considered safe for many types of surgery. However, it can cause several complications, such as back pain, post-dural puncture headache (PDPH), infection, hematoma, nerve injury, and even serious complications such as intracranial hemorrhage.

Case Summary
A 48-year-old woman with acute exacerbation on chronic appendicitis underwent elective open appendectomy under spinal anesthesia. At 2 days postoperatively, the patient fainted for less than one minute, she developed a severe headache which did non subside with analgesia, she also complained a double vision. Focal motor seizure on both of the leg was also observed. Brain computed tomography revealed right frontoparietal subdural hematoma with a mild midline shift. The patient was managed conservatively with bed rest, analgesics, mannitol, and intravenous fluids. She made a full recovery and was discharged 10 days later.

Discussion
Subdural hematoma (SDH) following spinal anesthesia is a rare but important anesthesia complication. The bleeding is suspected to be caused by a sudden drop in intracranial pressure due to loss of cerebrospinal fluid (CSF) at the lumbar puncture site. Sudden caudal displacement of the brain can cause traction on the arachnoid membrane and/or venous structures and lead to bleeding from ruptured blood vessels. Conservative management can be chosen for mild and stable SDH to avoid surgical risk, it involves close observation, symptomps and intracranial pressure control.

Conclusion
A thorough neurological examination is needed and imaging tests should be done early in patients experiencing severe post-spinal headache with neurological deficits, as it may due to SDH.

Keywords: subdural hematoma, spinal anesthesia, postspinal headache, non-traumatic subdural hematoma

ID_140 Research / Pain and Headache

Repetitive Transcranial Magnetic Stimulation vs Deep Brain Stimulation in Treatment of Central Post-Stroke Pain: An Analysis of Efficacy and Review of Safety

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Abstract

Background
Repetitive transcranial magnetic stimulation (rTMS) and deep brain stimulation (DBS) have shown promising therapeutic potential in the management of central post-stroke pain (CPSP) by modulating neural activity within central pain-processing pathways. However, current evidence regarding their comparative efficacy and safety remains limited.

Method
Literature was procured from databases, subjected to screening, and analyzed through a meta-analysis utilizing RevMan v5.4 and RStudio for meta-regression. The risk of bias was evaluated using the Cochrane Risk of Bias Tool 2 for randomized controlled trials and the Newcastle–Ottawa Scale for cohort studies.

Results
In the six studies included (n=94), DBS yielded a statistically significant reduction in numeric rating scale (NRS) (SMD = 1.55, 95%; CI = 1.05–2.04; I = 0%). In contrast, rTMS produced a modest reduction, bordering on statistical significance (SMD = 0.76, 95% CI = 0.01–1.51; I = 56%). Collectively, neuromodulation therapies significantly improved pain scores (SMD = 1.18, 95% CI = 0.54–1.83; I = 66%). The difference between DBS and rTMS was not statistically significant (p = 0.09). Little to no adverse events were reported in either intervention. The methodological quality of the included studies ranged from low to moderate.

Discussion
Neuromodulation therapies were associated with a significant overall reduction in pain scores. DBS produced more consistent effects, whereas rTMS responses varied due to differences in stimulation. Current evidence does not confirm the superiority of either neuromodulation modality, as limited sample sizes and study numbers may reduce statistical power.

Conclusion
Although DBS showed a numerically greater effect than rTMS in treating CPSP, no statistically significant difference was observed, with minimal reported adverse events in both interventions.

Keywords: Repetitive Transcranial Magnetic Stimulation, Deep Brain Stimulation, Central Post-Stroke Pain, Numeric Rating Scale, Safety

ID_141 Research / Pain and Headache

Predictors of Chronic Post-Traumatic Headache Following Head Injury: A Systematic Review and Meta-Analysis

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Abstract

Background

Background: Chronic post-traumatic headache (PTH), persisting >3 months after head injury, affects over 25% of adults with mild traumatic brain injury (mTBI) and contributes to prolonged disability. Evidence synthesis addressing predictors of PTH chronification remains limited.

Method

Methods: A PROSPERO-registered systematic review and meta-analysis following PRISMA 2020 searched PubMed/MEDLINE, Scopus, Cochrane Library, EuropePMC, and Epistemonikos. Studies including adults (≥18 years) with confirmed mTBI (ICHD-3/WHO criteria) reporting predictors of chronic PTH (>3 months) were eligible. Three reviewers independently screened studies, extracted data, and assessed quality using the Newcastle-Ottawa Scale (NOS). Random-effects meta-analysis generated pooled odds ratios (ORs) with 95% confidence intervals (CIs), and heterogeneity was assessed using I.

Results

Results: Ten studies (>600,000 participants) were included. Acute PTH occurred in 47–59% and chronic PTH in 23–36%. Six predictors were identified: headache at emergency department presentation (OR 2.88–3.43), female sex (OR 1.70–2.52), psychiatric comorbidity such as anxiety or depression (AOR 2.47), prior mTBI (OR 2.52), post-traumatic insomnia, and abnormal CT/MRI findings (OR 2.88). Machine-learning modelling identified four PTH trajectory subgroups with 84% classification accuracy. Inter-study heterogeneity was substantial (I = 50–93%).

Discussion

Discussion: Findings isolate chronic PTH as a predictive outcome beyond general post-concussion symptoms. Chronification may involve trigeminal sensitization and neuroinflammation; ICHD classification variability and moderate NOS scores.

Conclusion

Conclusion: Female sex, ED headache, psychiatric comorbidity, prior mTBI, insomnia, and abnormal neuroimaging predict chronic PTH and may support risk-based prevention. Prospective studies using standardized ICHD-3 criteria with longer follow-up are needed.

Keywords: Keywords: post-traumatic headache; mild traumatic brain injury; concussion; chronic headache; predictors; risk factors; systematic review; meta-analysis; ICHD-3

ID_142 Case Report /
Neurophysiology (Peripheral Nerve & Neuromuscular)

Myasthenic Crisis Complicated by Aspiration, Cardiac Arrest, and Hypoxic-Ischemic Encephalopathy, with Subsequent Diagnosis of Systemic Lupus Erythematosus: A Case Report

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Abstract

Background
Myasthenic crisis is a life-threatening exacerbation of myasthenia gravis that causes bulbar dysfunction and/or respiratory weakness severe enough to require ventilatory support. Coexisting systemic autoimmune disease may complicate diagnosis and treatment.

Case Summary
A 41-year-old female with a known diagnosis of myasthenia gravis (MG) presented after several days without pyridostigmine. She became dysphagic when eating, leading to vomiting, acute dyspnea, and loss of consciousness, followed by emergency intubation and cardiopulmonary resuscitation, which resulted in a return of spontaneous circulation. Blood gas revealed mixed hypercapnic-metabolic acidosis with marked hyperlactatemia (8.92 mmol/L), indicating severe peri-arrest systemic hypoperfusion. During intensive care, she developed quadriparesis, recurrent seizures, and prolonged ventilator dependence. Serum acetylcholine receptor antibody was strongly positive (24.90 nmol/L), supporting acetylcholine receptor (AChR)-positive myasthenia gravis. Brain magnetic resonance imaging (MRI) revealed hyperintense basal ganglia and slightly hyperintense cortical cerebri, suspected for hypoxic-ischemic encephalopathy. Autoimmune workup of anti-nuclear antibody (ANA) indirect immunofluorescence (IF) and profile showed positivity with a speckled pattern at 1:100 and borderline ribonuclearprotein/Smith (RNP/Sm) antibody reactivity. The immunology team diagnosed systemic lupus erythematosus (SLE) and initiated mycophenolate sodium and methylprednisolone. She underwent six sessions of therapeutic plasma exchange.

Discussion
This case illustrates a catastrophic myasthenic crisis cascade, from treatment interruption and bulbar dysfunction to complications of aspiration, cardiac arrest, and neurological injuries. The coexistence of MG and SLE is uncommon and can complicate neurologic and immunologic manifestations.

Conclusion
Early airway control, immunotherapy, and reassessment of coexisting autoimmune disease are crucial in myasthenic crisis because secondary complications may determine the outcome.

Keywords: myasthenia gravis, myasthenic crisis, systemic lupus erythematosus, aspiration, cardiac arrest, hypoxic-ischemic encephalopathy

ID_143 Research / Neuro-Vascular

Research Trends and Emerging Insights on Panax notoginseng Saponins in Acute Ischemic Stroke: A Systematic Literature Review

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Abstract

Background
Panax notoginseng saponins (PNS) has garned increasing attention as a potential therapeutic agent for acute ischemic stroke. However, quantitative analyses of research trends and knowledge structures in this field remain limited. This study aimed to evaluate the research progress and identify key trends in studies investigating PNS in acute ischemic stroke.

Method
A comprehensive literature search analysis conducted using the Scopus database to identify publications related to the role of PNS in acute ischemic stroke. The search strategy included terms such as "stroke", "Panax notoginseng saponin", and "xuesaitong" focusing on studies exploring neuroprotective, anti-inflammatory, antioxidant, and antiplatelet effects. Relevant data were extracted and analyzed, and research networks were visualized using VOSviewer.

Results
A total of 43 publications met the inclusion criteria. The annual number of publications demonstrated a fluctuating but overall increasing trend from 2017 to 2024, indicating growing scientific interest in this research area. Evidence-Based Complementary and Alternative Medicine was identified as the leading journal. Keyword co-occurrence analysis revealed that major research themes included "Panax notoginseng saponin," "Xuesaitong," "ginseng," and "herbal medicine," highlighting the focus on pharmacological mechanisms and therapeutic efficacy of PNS in acute ischemic stroke.

Discussion
These findings suggest that current research mainly focuses on the neuroprotective mechanisms of PNS, including anti-inflammatory, antioxidant, anti-apoptotic, and angiogenic effects associated with neuronal survival and vascular protection after ischemic injury.

Conclusion
Research on PNS in acute ischemic stroke continues to grow, highlighting its potential as a neuroprotective therapeutic agent and a promising adjunctive therapy for improving stroke outcomes.

Keywords: Panax notoginseng saponins; acute ischemic stroke; neuroprotection; bibliometric analysis; neuroinflammation.

ID_144 Research / Neuro-Behavior

When Sleep Breaks Apart: The Cognitive Impact of Sleep Fragmentation in Adults—A Systematic Review

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Abstract

Background

Sleep continuity is increasingly recognized as a key determinant of cognitive and neural health. Beyond sleep duration and clinically defined sleep disorders, sleep fragmentation has emerged as a distinct neurophysiological phenomenon. Evidence suggests that fragmented sleep may contribute to early deficits in cognitive function including attention, vigilance, and executive function. However, existing evidence remains fragmented, and sleep fragmentation is often grouped with other sleep disorders.

Method

This systematic review followed PRISMA guidelines and we include both experimental dan observed sleep fragmentation from adults aged 18–65 years without neurological and psychological problems affecting cognitive. Sleep fragmentation should be objectively measured using polysomnography, actigraphy, or clearly defined experimental fragmentation protocols. The primary outcome was overall cognitive performance, while domain-specific cognitive outcomes (vigilance, executive function, processing speed, working memory, and cognitive flexibility) were analysed separately. Data were analysed using vote counting based on the direction of effect with a binomial test and harvest plot.

Results

Fourteen of the sixteen included studies favoured the unfragmented sleep group, while two reported no clear difference in overall cognitive outcomes between two groups ($p=0.00012$). However, when cognitive domains were analysed separately, we found no significant differences ($p>0.5$).

Discussion

This study found that sleep fragmentation significantly affects overall cognitive performance but not vigilance, executive function, processing speed, working memory, and cognitive flexibility due to a limited number of studies.

Conclusion

Sleep fragmentation is associated with poorer overall cognitive performance in the adult population. Nevertheless, evidence for specific cognitive domains remains inconclusive.

Keywords: Sleep fragmentation, Sleep Continuity, Cognitive performance, Polysomnography, Actigraphy

ID_145 Case Report / Neuro-Restoration

QEEG-Guided Multimodal Neuromodulation Using tDCS and Alpha Binaural Beats in Pediatric Autism Spectrum Disorder: A Case Report

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Abstract

Background

Autism spectrum disorder (ASD) involves abnormalities in cortical excitability, neural oscillations, and large-scale network connectivity. Given the marked neurophysiological heterogeneity of ASD, quantitative electroencephalography (QEEG) provides an objective biomarker to identify individualized neural dysregulation and guide targeted neuromodulation. Multimodal neuromodulation may provide synergistic circuit modulation beyond single-modality approaches while remaining non-invasive and relatively cost-effective.

Case Summary

From September 2025 to January 2026, a 6-year-old boy diagnosed with ASD (DSM-5) underwent a personalized neuromodulation program at Sensory Land Kids Clinic (Jakarta, Indonesia) while continuing standard therapies (occupational, sensory integration, speech, and behavioral). Initial QEEG was performed prior to intervention using the International 10–20 system and repeated after each cycle. Cycle 1 applied simultaneous tDCS (0.5 mA; anode F3, cathode F4) with alpha-frequency binaural beats (BB). Post-cycle QEEG revealed a substantial reduction in right-hemisphere beta relative power toward the low range. Cycle 2 was then adapted to a sequential priming protocol consisting of 30 minutes of alpha BB followed by 1 mA tDCS using a right prefrontal montage (F8–Fp2). No adverse effects occurred. The Autism Treatment Evaluation Checklist (ATEC) score improved from 67 to 55. Post-treatment QEEG demonstrated suppression of pathological beta activity, increased alpha power, and partial normalization of phase-lag connectivity.

Discussion

The synergy between electrical and auditory stimulation may involve stochastic resonance and neural entrainment. Alpha-frequency binaural beats may act as a neural primer enhancing responsiveness to tDCS-induced plasticity. Improved phase-lag connectivity suggests more efficient sensorimotor network integration in ASD.

Conclusion

QEEG-guided multimodal neuromodulation may offer a promising neurorestorative strategy for pediatric ASD.

Keywords: Autism spectrum disorder; transcranial direct current stimulation; binaural beats; neuromodulation; quantitative electroencephalography; neurorestoration.

ID_146 Case Report /
Neuro-Ophthalmology & Neuro-Otology

Probable Tolosa-Hunt Syndrome Presenting as Painful Ophthalmoplegia Initially Suspected as Cluster Headache and Intracranial Aneurysm

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Abstract

Background

Tolosa-Hunt syndrome (THS) is a disorder characterized by painful ophthalmoplegia caused by granulomatous inflammation of the cavernous sinus. Because several other conditions may produce similar manifestations, THS is considered a diagnosis of exclusion. Intracranial aneurysms involving the cavernous internal carotid artery are important differentials to exclude in patients presenting with painful ophthalmoplegia.

Case Summary

A 56-year-old woman presented with a four-day history of right-sided hemicranial headache accompanied by ipsilateral autonomic symptoms. One day before presentation, she developed diplopia, ptosis, and painful ophthalmoplegia. Neurological examination demonstrated isolated right cranial nerve III palsy with preserved pupillary reflexes. Initial evaluation raised suspicion for cluster headache due to unilateral headache and cranial autonomic symptoms. Non-contrast head CT-scan revealed no intracranial hemorrhage or mass lesion. Because of persistent ophthalmoplegia, intracranial aneurysm was suspected, and CT cerebral angiography was performed, which showed no aneurysm or vascular abnormality. A working diagnosis of probable Tolosa-Hunt syndrome was considered, and intravenous methylprednisolone therapy was initiated, resulting in gradual improvement of ocular motility.

Discussion

This case highlights the diagnostic challenge of painful ophthalmoplegia and the overlap between Tolosa-Hunt syndrome, cluster headache, and intracranial aneurysm. Exclusion of aneurysmal disease through vascular imaging was essential before considering THS. Although magnetic resonance imaging was not performed, the clinical presentation, exclusion of alternative etiologies, and response to corticosteroid therapy supported the diagnosis.

Conclusion

Tolosa-Hunt syndrome should be considered in patients presenting with painful ophthalmoplegia after vascular causes have been excluded. Careful clinical evaluation combined with vascular imaging may allow a reasonable working diagnosis and facilitate early corticosteroid therapy.

Keywords: Tolosa-Hunt syndrome, Painful Ophthalmoplegia, Oculomotor Nerve Palsy, Cavernous Sinus, Intracranial Aneurysm

ID_147 Research / Neurophysiology (Epilepsy)

From Pixels to Patients: A Systematic Review and Meta-Analysis of Mobile Health Interventions for Quality of Life and Mental Health in Epilepsy

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Abstract

Background
Epilepsy is a neurological disorder characterized by recurrent unprovoked seizures and associated with significant physical and psychosocial burdens, often impairing patients' quality of life and mental health. Mobile health (mHealth) interventions have the potential to support patient management. However, evidence regarding the effectiveness of mHealth interventions in improving these outcomes among patients with epilepsy remains limited.

Method
This study searched PubMed, EBSCOHost, Scopus, and Cochrane Library following PRISMA guidelines to identify randomized controlled trials evaluating mHealth interventions in epilepsy. A meta-analysis estimated pooled effects on quality of life (QOLIE-31), anxiety (GAD-7), and depression (PHQ-9).

Results
mHealth interventions showed a small but statistically significant improvement in quality of life (SMD = 0.39; 95% CI 0.02 to 0.75), although substantial heterogeneity was observed (I = 90%). Depression scores were significantly reduced with consistent results across studies (MD = −2.31; 95% CI −3.41 to −1.20; I = 0%). In contrast, no significant improvement was observed for anxiety (MD = −0.23; 95% CI −2.44 to 1.99), with considerable heterogeneity (I = 83%).

Discussion
mHealth interventions were associated with improvements in quality of life and depression among epileptic patients. However, no significant improvement was observed in anxiety outcomes. These findings suggest that mHealth interventions could serve as a supportive component into epilepsy patient care. This meta-analysis has limitations, including high heterogeneity due to the different formats of the mHealth interventions and conflicting results. These limitations highlight the need for development of standardised mHealth intervention and employing consistent outcome measures.

Conclusion
mHealth interventions may improve quality of life and depression in epileptic patient, suggesting a promising approach to support patient care.

Keywords: Epilepsy, mHealth, Mental Health, Quality of Life.

ID_148 Research / Neuro-Vascular

Direct Oral Anticoagulants Versus No Anticoagulation In Atrial Fibrillation Patients With Prior Intracranial Hemorrhage: A Systematic Review And Meta-Analysis Of Randomized Trials

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Abstract

Background

Anticoagulation for stroke prevention in atrial fibrillation (AF) patients with prior intracranial hemorrhage (ICH) is clinically challenging due to the high risk of recurrent
bleeding. The optimal management strategy in this high-risk population remains uncertain. This study evaluated the efficacy and safety of direct oral anticoagulants (DOACs) versus no anticoagulation in this high-risk population.

Method

Following PRISMA 2020 guidelines, we searched PubMed, Taylor & Francis,Wiley, and Springer through February 8, 2026. RCTs comparing DOACs to no anticoagulation in adults with AF and prior ICH were included. Risk of bias was assessed using the Cochrane RoB 2.0 tool; pooled hazard ratios (HR) were calculated for recurrent ICH and ischemic stroke.

Results

Three RCTs were included. DOAC therapy was associated with a significantly higher risk of recurrent ICH (HR = 4.03, 95% CI: 1.63–9.93, p = 0.002; I = 2%). Conversely, DOACs significantly reduced ischemic stroke risk (HR = 0.49, 95% CI: 0.27–0.87, p = 0.02), although heterogeneity was high (I = 73%).

Discussion

DOACs provide a clear benefit in stroke reduction but carry a fourfold increase in recurrent ICH risk. The substantial heterogeneity in stroke outcomes suggests that the net
clinical benefit may vary significantly based on individual patient profiles, necessitating a cautious, personalized approach to therapy

Conclusion

DOACs effectively prevent ischemic stroke but significantly increase recurrent ICH risk in AF patients with prior ICH. These findings highlight a critical therapeutic tradeoff, emphasizing the need for individualized risk-benefit assessments.

Keywords: Atrial fibrillation, Intracranial hemorrhage, Direct oral anticoagulants, Ischemic stroke

ID_150 Research / Movement Disorder

Determinants of Diagnostic Delay in Parkinsonism: A Multicenter Study

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Abstract

Background
Diagnosis of Parkinsonism is not typically done in a short time. Many factors affect the time required to reach the diagnosis. We aim to describe time-to-diagnosis in our cohort and some of its determinants.

Method
We conducted a cross-sectional study involving Parkinsonism patients from multiple centers. Secondary data were collected, which include demographics, motor symptom onset, time of diagnosis, severity measures, cognitive status, and gait characteristics.

Results
A total of 101 patients (68.3% male) were recruited with a median age of 63 (23-95) and an age of onset of 60 (19-90). The majority (42.5%) of patients were late-onset, Hoehn and Yahr (H&Y) stage 2 (47.8%), with an MDS-UPDRS score of 30.50 (3-94) and a MoCA score of 26 (4-30). In our cohort, the median time-to-diagnosis is 1 year (0–19). We found a significant difference in time-to-diagnosis between onset groups, falls/postural instability ($p<0.05$), and a weak correlation with MoCA (=0.268). There is no significant association with MDS-UPDRS, H&Y, freezing, or gait difficulty ($p>0.05$).

Discussion
Falls or postural instability, and the late-onset group had a faster time-to-diagnosis. Patients with more intact cognition, which may reflect preserved function, had longer time-to-diagnosis. These findings seem to suggest that patient awareness, incentives of healthcare contact, or degree of clinical suspicion are the determinants of time-to-diagnosis in Parkinsonism. There was no association with severity, consistent with the lack of disease-modifying treatment.

Conclusion
These findings may suggest that time-to-diagnosis in Parkinsonism may be influenced more by symptom recognition and clinical suspicion. Improved clinical and patient awareness is needed.

Keywords: Parkinsonism, Parkinson's disease, Diagnostic time

ID_151 Research / Neuro-Behavior

Sleepless Nights in Parkinson's Disease: A Systematic Review on Objective Evidence of Non-Invasive Neurostimulation for Sleep Improvement

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Abstract

Background
While Parkinson's Disease (PD) has become one of the most common neurodegenerative conditions, sleep disorders are commonly observed in these patients. Neurostimulation has emerged as a potential therapy to improve this condition, yet objective evidence remains unsynthesized.

Method
Keywords searching through Google Scholar following a systematic search of PubMed, Scopus, and ScienceDirect was conducted in January 2026, adhering to PRISMA guidelines. Eligibility includes PD patients with sleep disorders, non-invasive neurostimulation as intervention therapy, and reported objective sleep parameters. Risk of bias was assessed using RoB 2.

Results
Of 89 studies screened, five involving 241 patients were included. Four reported polysomnography outcomes, while one study demonstrated an actigraph outcome. Most of the studies used repetitive Transcranial Magnetic Stimulation (rTMS). However, one study used Transcranial Direct Current Stimulation (tDCS) intervention. Nonetheless, non-invasive neurostimulation across all of the studies showed improvement in sleep parameters measurement.

Discussion
This review examines the impact of neurostimulation on sleep disorders in Parkinson's disease using objective measures such as polysomnography and actigraphy. Studies by Wu et al. and Feng et al. reported increased rapid eye movement sleep percentage, total sleep time, and sleep efficiency after low-frequency rTMS targeting the dorsolateral prefrontal cortex, alongside reduced awakenings and sleep latency. Khedr et al. and Van Dijk et al. observed similar results using parietal cortex stimulation. Besides, Lu et al. demonstrated similar improvement and an increase in sleep duration using tDCS. However, limitations include substantial heterogeneity and small sample sizes.

Conclusion
Non-invasive neurostimulation robustly promises results in sleep parameters in PD patients suffering from sleep disorders.

Keywords: Parkinson's Disease; sleep disorders; neurostimulation; brain stimulation; polysomnograhy; actigraph

ID_153 Case Report / Neurophysiology (Epilepsy)

Post-Traumatic Epilepsy with Left Temporal Epileptiform Discharge on EEG: A Case Report of a 22-Year-Old Male

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Abstract

Background

Post-Traumatic Epilepsy (PTE) is characterized by recurrent unprovoked seizures occurring more than seven days after the initial trauma with a reported incidence ranging from 2–50% depending on the severity of the injury. The temporal lobe is particularly vulnerable to coup-contrecoup injury mechanisms in head trauma.

Case Summary

A 22-year-old male was brought to the emergency department with impaired consciousness accompanied by generalised tonic-clonic seizures. The onset was sudden. The patient had a history of a road traffic accident one year prior. Once the patient was clinically stable, motor strength was assessed at 4/4 in all extremities. HIV serology was non-reactive. Contrast-enhanced head CT scan revealed no infarction, intracranial haemorrhage, or space-occupying lesion (SOL). EEG demonstrated epileptiform discharges in the left temporal region. Acute seizure management was initiated with an intravenous phenytoin drip, followed by divalproex sodium 2 × 500 mg, citicolin 2x500mg as maintenance therapy.

Discussion

that PTE occurs more frequently in males within the 15–27 year age group. The left temporal epileptiform discharge on EEG is consistent with the site of coup-contrecoup injury from the prior head trauma. The temporal lobe sits directly above the sphenoid ridge and petrous ridge. when the brain strikes these ridges, focal cortical damage in the left temporal region. A collaborative rehabilitation programme with the Department of Physical Medicine and Rehabilitation (PMR) was initiated to improve motor strength and functional recovery.

Conclusion

A multidisciplinary treatment approach integrating anticonvulsants, neuroprotective agents, and motor rehabilitation has proven to yield favourable clinical outcomes and serves as a replicable management model for similar cases

Keywords: post-traumatic epilepsy, traumatic brain injury, epilepsy, neurological emergency

ID_158 Research / Neurophysiology (Epilepsy)

Epilepsy in Chromosome 15 Aberrations: A Scoping Review

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Abstract

Background
Chromosome 15 aberrations are estimated to occur in 1 of 5,000–30,000 births, frequently associated with mild to severe seizures. This review aims to map clinical and genetic heterogeneity in Chromosome 15-related epilepsies.

Method
A comprehensive search of PubMed, ScienceDirect, and the Cochrane Library was conducted to identify studies on chromosome 15 aberrations associated with epilepsy. Data extraction focused on the genotype–phenotype landscape, diagnostic testing, and inheritance patterns. Eligible study included case reports, case series, case–control studies, and cohort studies. This scoping review followed the PRISMA-Scoping Review guidelines.

Results
Seven studies comprising 43 patients were included, of whom 90.7% were pediatric cases. Most used testings were karyotyping, fluorescence in situ hybridization/FISH, chromosomal microarray analysis/CMA. The most frequent aberrations were microdeletions (91.6%), duplications (4.7%), uniparental disomy (1.9%), trisomy (0.9%), and pericentric inversion (0.9%), with hotspot variants involved the 15q11–13 region. The most common seizure types were tonic–clonic and myoclonic seizures (each 14.9%), followed by focal seizures (13.8%). Associated comorbidities included neurodevelopmental disorders, psychiatric conditions, and structural anomalies (congenital heart defects).

Discussion
Seizures associated with chromosome 15 abnormalities frequently coexist with neurodevelopmental and psychiatric comorbidities, reflecting the involvement of multiple genes within the affected chromosomal region. Several studies suggest that maternal inheritance may confer up to a 50% transmission risk, whereas recurrence risk estimates for paternal uniparental disomy remain unclear.

Conclusion
These findings highlight the importance of chromosomal testing in patients with epilepsy and coexisting neurodevelopmental disorders.

ID_159 Research / Neuro-Behavior

Decoding Glymphatic System Dysfunction and Immuno-Metabolic Architectures in Early Alzheimer Disease: An Integrated Bibliometric, Multiomic, and Bioinformatic Study

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Abstract

Background

Glymphatic system failure is an upstream pathogenic driver in Alzheimer disease. While Aquaporin-4 polarization is emphasized, a multiomic framework linking cellular metabolism with spatial neuro-immune crosstalk remains fragmented. This study maps global research and constructs an immuno-metabolic network using spatial transcriptomic data.

Method

A bibliometric mapping from database inception identified principal research clusters. Concurrently, a Python-based bioinformatic pipeline integrated real-world single-cell RNA sequencing and spatial transcriptomic datasets from the Gene Expression Omnibus. Random Forest and Least Absolute Shrinkage and Selection Operator algorithms executed dimensionality reduction and differential hub gene selection. Intercellular networks were validated via inferential signaling algorithms.

Results

The 1,842-manuscript bibliometric network validated a shift toward glymphatic clearance. Multiomic integration isolated six upstream hub genes regulating astrocytic plasticity and perivascular macrophage metabolite elimination. Spatial models demonstrated severe downregulation in hyaluronan clearance signaling and a quantifiable increase in memory CD4+ T cell adaptive immune activity within perivascular spaces.

Discussion

This network demonstrates a paradigm shift from a singular amyloid focus to compartmental cellular metabolic failure. The study directly quantifies attenuated immunoregulatory signaling negatively associated with glymphatic channel integrity prior to macroscopic neurofibrillary accumulation, utilizing robust empirical datasets to ensure generalizability.

Conclusion

Genomic-level bioinformatic integration empirically confirms an inter-regulative network among glymphatic drainage dysfunction, metabolic shifts, and immune repression in early Alzheimer disease, providing a quantitative architecture for novel intraparenchymal clearance pharmacological interventions.

Keywords: Glymphatic System, Multiomics, Spatial Transcriptomics, Alzheimer Disease, Aquaporin-4, Bioinformatic Modeling.

ID_163 Research / Neurophysiology (Epilepsy)

The Association between Sleep Architecture and Excessive Daytime Sleepiness: A Polysomnography Study

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Abstract

Background

Excessive Daytime Sleepiness (EDS) is a major limiting symptom in sleep disorders, affecting daytime functioning and quality of life. Different sleep stages have different restorative function, affecting the pathophysiology of EDS. The aim of this study is to analyse the association between sleep architecture and excessive daytime sleepiness based on Polysomnography (PSG) and Epworth Sleepiness Scale (ESS).

Method

This is a retrospective analytical study on 2024-2025 PSG data from Cipto Mangunkusumo National Hospital. Sleep architecture was classified into N1 (normal range: 3-8% of total sleep time), N2 (45-55%), N3 (12-23%) and REM Sleep (20-25%). Wake After Sleep Onset (WASO) and Sleep Efficiency (SE) data were also obtained with normal values defined at <30 minutes and >85%, respectively. EDS was classified into positive (ESS >10) and negative (ESS ≤10).

Results

A population of 98 subjects (58% male, mean age 43 y.o) were included in the analysis. EDS was found in 71% of subjects. There was a significant association between N1 sleep and EDS ($p<0.007$) where EDS is 1.92x more likely in subjects with higher N1 sleep proportion. There was no statistically significant association between other stages of sleep (N2, N3, REM) or other sleep parameters (WASO, SE) with EDS.

Discussion

Subjects with high proportion of N1 will have lower proportion of other stages of sleep. The restorative function of sleep happens mainly during deep sleep (N3 and REM). This explains the excessive daytime sleepiness found in this study.

Conclusion

Sleep architecture is an integral part of the restorative function of sleep and should be considered in patients with EDS.

Keywords: excessive daytime sleepiness (EDS), polysomnography (PSG), sleep architecture