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Impact of Air Pollution on the Clinical Exacerbation of Central Demyelinating Disease: Data from Northern Thailand MS and NMOSD Registry

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Introduction: Particulate matter (PM) 2.5 and PM10 are implicated in neurological diseases, yet their impact on central demyelinating diseases like multiple sclerosis (MS) and neuromyelitis optica spectrum disorder (NMOSD) remains unclear.

Objectives: To determine the association between the levels of PM2.5 and PM10 and the exacerbation of MS and NMOSD.

Materials and Methods: Patients with clinical exacerbations of MS and NMOSD in Northern Thailand from 2013 to 2022 were enrolled. Eligible patients were categorized based on air pollution exposure (defined as PM2.5 > 15 μm^3 and PM10 > 45 μm^3) or no air pollution exposure. Outcomes assessed included clinical characteristics, Expanded Disability Status Scale (EDSS), and functional outcomes.

Results: We analyzed 126 exacerbations (mean age: 44.9 \pm 14.9 years, 132 NMOSD, 49 first exacerbations), with the highest incidence four months post-peak air pollution. The exposure group had higher severity, showing increased rates of unfavorable EDSS at exacerbation and 90 days (56.3% vs. 23.6%, $P < 0.001$ and 47.9% vs. 16.4%, $P < 0.001$). Gadolinium enhancement in PM2.5 exposure was significantly higher (71.4% vs. 34.9%, $P = 0.01$). The PM2.5 exposure group also had a higher rate of second-line plasma exchange (21.4% vs. 7.4%, $P = 0.04$). PM2.5 exposure, not PM10, was associated with unfavorable EDSS at any time point, active radiological activity, risk of plasma exchange, and prolonged hospitalization.

Conclusion: PM2.5 and PM10 significantly impact MS and NMOSD patients, influencing disease severity, causing permanent disability, and prolonging hospitalization. A national policy on pollution control is imperative, and further data on long-term exposure together with other pollutants is still required.

Factors Associated with Status Epilepticus Treatment Outcomes: A Retrospective Study in A Tertiary Care Institution in Thailand

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Introduction: Status epilepticus (SE) is a medical emergency that requires prompt therapeutic interventions. Many individual medical and service system factors may influence successful seizure cessation. This study was designed to identify those factors for improving the quality of SE treatment.

Objective: To identify factors affecting good outcomes of treatment for SE.

Materials and Methods: This retrospective cohort study was conducted at Srinagarind Hospital, Khon Kaen University, Thailand, on SE patients 18 years and older seen between 2015-2021. Binary logistic regression was used to compare factors with good treatment outcomes (defined as seizure termination within 30 minutes of first antiepileptic drug (AED) administration).

Result: For patients with tonic-clonic SE, statistically significant higher odds ratios for good outcomes were found in a shorter onset-to-benzodiazepine time (odds ratio: 0.980, 95% CI: 0.962-0.998, $p=0.030$), a shorter onset-to-first AED time (odds ratio: 0.981, 95% CI: 0.962-1.000, $p=0.055$), and a good STESS score (4 or below) (odds ratio: 4.800, 95% CI: 1.650-13.967, $p=0.004$). However, for patients with nonconvulsive status epilepticus (NCSE), the odds ratios were not statistically significant. The study did not find any association between last type of AED, number of comorbidities, duration of hospitalization and treatment outcomes.

Conclusion: Treatment factors contributing to good treatment outcomes are shorter onset to benzodiazepine and first-line AED.

Enhancing Diagnostic Concordance in Parkinson's Disease: A Neurologist-Centric Analysis Using MediaPipe Hands

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Introduction: The diagnosis of Parkinson's disease (PD) relies on clinical criteria, particularly bradykinesia, which is subjectively assessed using scales such as UPDRS and MDS-UPDRS, impacting interrater reliability. However, the finger tapping test produces coefficients that vary among clinicians, resulting in reliability ranging from inadequate to exceptional.

Objectives: To improve the inter-rater reliability of the finger taps test in PD using MediaPipe Hands.

Materials and Methods: Three neurologists evaluated a random selection of 94 videos, utilizing MDS-UPDRS for bradykinesia diagnosis. Inter-rater reliability, measured by Krippendorff's alpha, was assessed both before and after neurologists viewed amplitude-time correlation graphs generated from the videos.

Results: Analysis of 94 participants (47 PD, 47 controls) indicated that PD participants were mostly male (59.6%), with symptoms lasting 1 to 5 years. UPDRS scores for PD participants were 1.9 (right hand) and 2.1 (left hand), while controls scored 0 for both hands. The Amplitude-time correlation graph revealed significant differences in tapping occurrences and amplitude percentages between PD and control groups. Krippendorff's alpha showed moderate-to-good agreement among neurologists for both the right and left hands, with and without the graph.

Conclusion: The amplitude-time correlation graph using MediaPipe Hands did not significantly enhance agreement in our study.

Incidence, Mortality Rate and Rate of Thrombolytic Therapy of Acute Stroke in Northeastern Thailand from 2017-2022

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Introduction: Stroke is a true medical emergency condition with thrombolytic treatment with recombinant tissue plasminogen activator as the standard treatment. In Thailand, including the Northeast region (Health region 7-10), stroke incidence and mortality rate have increased. However, there is no study of stroke incidence, recombinant tissue plasminogen activator (rtPA) access rate, and mortality rate by district in Northeastern Thailand

Objectives: This study aimed to present stroke incidence, access rate of thrombolytic treatment, and acute stroke mortality rates for each district in Northeast Thailand for the 5 years, 2017-2022.

Materials and Methods: The study drew from the Thai National Health Security Office's (NHSO) database for 2017 to 2022 and reported using rates per 100,000 population and percentage statistics.

Results: The overall incidence of acute stroke and acute ischemic stroke patients aged over 15 years in Northeastern Thailand were 264.19-331.70/100,000 population and 184.57-232.82/100,000 population respectively. The rtPA access rate was 6.09-8.01% (UC main) and 6.01-7.92% (UC refer). The mortality rate of acute ischemic stroke patients within 30 days and post-rtPA were 8.80-10.43% and 3.65-5.67% respectively.

Conclusion: In Northeastern Thailand, stroke incidence has shown an upward trend over the past 5 years. The number of acute ischemic stroke patients receiving rtPA has also been on the rise. The mortality rate in patients with acute ischemic stroke within 30 days declined from 2017 to 2019, then increased from 2020 to 2022. Particularly notable was the increase in the mortality rate among patients with acute ischemic stroke post-intravenous thrombolysis.

Prevalence of Cerebral Small Vessel Lesions in Mild Cognitive Impairment and Mild Alzheimer's Disease Patients in Memory Clinic

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Introduction: Alzheimer's disease (AD) raises global concern with its impact on daily living. Anti-amyloid monoclonal antibodies (mAb) serving as specific treatments used in mild cognitive impairment (MCI) and mild dementia due to AD. Severe cerebral small vessel disease (SVD) lesions such as microbleeds and white matter hyperintensities are listed as exclusions according to the recommendation for mAb treatment. In Thailand, there is no prevalence study of SVD lesions specifically in these patient groups. The findings will provide important information for considering cost-effectiveness of anti-amyloid therapy, being expected to become treatment option for Thai AD patients.

Objectives: The primary outcome is to declare prevalence of cerebral small vessel lesions and brain atrophy in MCI and mild AD. Secondary outcomes include analysis of risk factors for abnormal MRI finding and correlation between SVD severity and cognitive tests.

Materials and Methods: The cross-sectional study was carried out at King Chulalongkorn Memorial Hospital Memory Clinic. Amnesic MCI and mild AD patients were diagnosed by clinical criteria, cognitive tests and brain MRI. Serious medical conditions and incomplete MRI were excluded. Visual rating scales were used to evaluate SVD and brain atrophy lesions (microbleeds, Fazekas score, lacunes, MTA and GCA scores). Baseline characteristics data and cognitive tests were accessed from medical records. Simple and amended SVD scores were used to determine SVD severity and analyzed correlation with cognitive tests.

Results: In the study involving 102 patients, 73.5% had MCI, and 26.5% had mild AD, with average age at diagnosis of 75.0 ± 8.0 years. Microbleeds were present in 50% of patients, with only 17.6% had ≥ 4 lesions. Twenty individuals (19.6%) had either ≥ 4 microbleed lesions or Fazekas score of 3. There was no evidence of superficial siderosis or stroke involving large vessel territory. Those without microbleeds had higher TMSE score (25.4 vs 23.5; $p=0.009$). MTA score were associated with lower TMSE and MoCA scores (26.4 vs 22.7; $p<0.001$ and 22.1 vs 19.2; $p=0.001$, respectively). Weak negative correlation between simple & amended SVD scores and TMSE scores were showed ($r=-0.371$ and -0.384 , respectively; $p<0.001$), along with moderate negative correlation between MTA score and both TMSE & MoCA score ($r=-0.631$ and -0.443 , respectively; $p<0.001$).

Conclusion: With MCI and mild AD, 19.6% of the samples fell within the exclusion criteria for anti-amyloid therapy, in part of cerebrovascular imaging lesions. The results can be used to consider role of anti-amyloid therapy in Thailand in the future.

Prevalence of People Living with Dementia with Cyclic Temporal Pattern of Behavioral and Psychological Symptoms of Dementia in Memory Clinic of King Chulalongkorn Memorial Hospital: A Descriptive Diary-based Study

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Introduction: Behavioral and psychological symptoms of dementia (BPSD) profoundly impact individuals with dementia and their caregivers. Despite existing pharmacological interventions, symptom control remains challenging, often prompting polypharmacy with potential risks. Notably, in clinical practice, caregivers frequently report recurring patterns in patients' BPSD but lack empirical studies supporting these observations.

Objectives: The primary objective of our research is to explore the prevalence of predictable, cyclic BPSD patterns to minimize risks associated with excessive medication use.

Materials and Methods: Implementing a diary-based approach, we recruited 24 dementia patients attending a memory clinic. Participants documented patients' BPSD occurrences using hourly recordings across a 28-day period. We categorized BPSD subcategories based on the NPI-Q framework. Cyclic patterns were defined as recurrent BPSD episodes demonstrating consistent intervals within a 50% deviation range.

Results: Strikingly, 83% (n=20) of participants exhibited cyclic BPSD patterns. Among the various BPSD subcategories, anxiety, apathy, nighttime behavioral disturbances, and appetite/eating abnormalities emerged as the most prominent features within these predictable fluctuations. Variation in median intervals was observed across subcategories, ranging from 1.0 day to 3.5 days, thereby substantiating the biopsychosocial model of BPSD pathogenesis.

Conclusion: Cyclic BPSD patterns are surprisingly common, suggesting potential for personalized medication schedules based on predicted symptom peaks. Further research with larger populations is needed to validate these findings and develop tailored interventions for improved dementia care.

Changes in Epileptic Network Functional Connectivity of Medial Temporal Lobe Epilepsy with Hippocampal Sclerosis Patients Analyzed Using EEG

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Introduction: Medial temporal lobe epilepsy with hippocampal sclerosis (MTLE-HS) is an important epilepsy syndrome in the clinical setting. It is characteristically drug-resistant and often requiring epilepsy surgery for seizure control. Scalp EEG is often performed in MTLE-HS patients as part of treatment planning. Functional networks could be constructed from EEG data and could provide information regarding brain network changes in MTLE-HS patients. These findings could help in understanding the pathophysiology and may predict treatment outcome.

Objectives: To assess the different functional connectivity patterns constructed with scalp EEG data using connectivity measures coherence (Coh) and phase-locking value (PLV) between different patient subgroups.

Materials and Methods: The study included individuals aged 15 years and older with MTLE-HS who received 24-hour video EEG monitoring between 2018 and 2023. EEG data was retrieved from Chulalongkorn Comprehensive Epilepsy Center (CCEC). Connectivity measures were calculated pairwise between each electrode of a recorded EEG to construct a connectivity matrix which were then compared between groups 1) left-sided and right-sided lesions 2) favorable and unfavorable surgical outcomes.

Results: 41 patients with MTLE-HS who received 24-hour EEG monitoring were identified. 18 patients with left-sided lesions and 13 patients with right-sided lesions were included in analysis. Significant difference between PLVs of the two groups were found in delta frequencies ($M_{left} = 0.47$ $IQR_{left} = 0.05$, $M_{right} = 0.49$ $IQR_{right} = 0.03$, $U = 61$, $p < 0.05$), but not connectivity measures in other sub-bands. There was no significant difference between connectivity measures between favorable ($n = 8$) and unfavorable ($n = 8$) surgical outcomes. ANOVA revealed effect of the analyzed groups only when considering interactions from other variables.

Conclusions: Some functional connectivity differences in MTLE-HS groups could be detected with scalp EEG. Their use in clinical setting may need further research incorporating a larger sample size, or identification of other potential variables that may affect outcome.

Effect of Mozart K.448 on Interictal Epileptiform Discharges in Drug-Resistant Adult Epilepsy Patients in King Chulalongkorn Memorial Hospital

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Background: Treatment options for drug-resistant epilepsy i.e., epilepsy surgery, ketogenic diet or neuromodulations are inaccessible in some settings. Complimentary music therapy is of interest by many researchers. However, evidence from randomized-controlled trials (RCTs) to support its efficacy are still scarce but required.

Objectives: To validly assess the efficacy of Mozart K.448 on reducing interictal epileptiform discharges (IEDs) in adult patients with drug-resistant focal epilepsy.

Method: This is a crossover RCT study. Adults with drug-resistant focal epilepsy were included. Stratified 1:1 randomization by epileptic foci, temporal and extratemporal foci, was performed. Intervention consisted of two arms i.e., Mozart arm and control arm. Study period encompassed 2 consecutive nights, each night consisted of baseline and intervention period. Outcomes were IED number and proportion of patients with significant IED reduction i.e., reduction $\geq 25\%$. Intention-to-treat and per-protocol analyses were performed. Within-group, within-subject and between-group analyses were used to test differences of IED number when listened to Mozart piece as compared with baseline or with Control. Wilcoxon match signed rank test was employed.

Results: Twenty-six patients were randomized; 13 in Mozart and 13 in control arm. Overall, 16 (61.54%) out of 26 patients had significant IED reduction when listening to the Mozart piece, as compared with only 9 (26.92%) when continuing sleep (silence), with relative risk of 1.78 (95% CI 0.97, 3.27; $p = 0.052$). Significant effects were demonstrated upon within-group, within-subject and between-group analyses. Between-group analysis showed that IED number during intervention period i.e., listening to Mozart piece in Mozart arm and silence in control arm was significantly different, lower number in Mozart arm, 39.5 (IQR 89) vs 56.5 (IQR 114); $p = 0.007$.

Conclusion: Our study provides evidence of beneficial effect of the Mozart K.448 on reducing IEDs in adult patients with drug-resistant focal epilepsy. Patients with temporal rather than extratemporal lobe epilepsy better responded to the Mozart piece. Mozart K.448 is safe and feasible in real practice. However, further RCT study assessing the long-term effect on seizure control is warranted.

Cerebrospinal Fluid Proteomic Analysis with Machine Learning for Assisting the Diagnosis of Patients Presenting with Alteration of Consciousness

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Introduction: Altered consciousness (AOC) is a common symptom with variety of etiologies, including both structural central nervous system (CNS) and extra-CNS disorders. Distinguishing between structural and non-structural causes is crucial for guiding appropriate diagnostic and therapeutic interventions. Although neurofilament light chain has been studied as a biomarker for structural CNS disorders, its use in clinical practice is limited due to certain drawbacks.

Objectives: To assess the potential of cerebrospinal fluid (CSF) MALDI TOF-based proteomics for the discovery of novel biomarker for distinguishing the etiology of AOC arising from structural causes as opposed to non-structural causes.

Materials and Methods: The study included individuals aged 15 years and older who experienced altered consciousness and required lumbar puncture. CSF samples were collected, and MALDI TOF-based proteomics were applied, analyzing samples within the mass range of 500-3000 m/z. Spectra from patients with confirmed diagnoses were utilized and twenty crucial mass features were identified. These features were employed in a principal component analysis and which several supervised classification models were constructed from.

Results: A total of thirty-nine participants were included, with a median age of 62 years. Among them, 61.5% received diagnoses falling into the structural group. Utilizing support vector machine, we achieved a notable AUC of 0.939 (95%CI 0.871-1.00) in distinguishing between structural and non-structural groups in CSF by MALDI TOF MS

Conclusion: Our results indicate that MALDI TOF MS demonstrates potential in effectively distinguishing between structural and non-structural groups in patients experiencing AOC. However, further validation studies are necessary to confirm these findings.

The Effects of Blood-Brain Barrier Permeability on Alzheimer's Disease Plasma Biomarkers and Their Impact on Clinical Performance

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Introduction: The validation of blood-based biomarkers presents a promising role in Alzheimer's disease (AD) diagnosis. However, despite awareness of confounding factors, inaccuracies persist in AD diagnosis using plasma p-tau. Notably, diverse conditions that modify blood-brain barrier (BBB) permeability have been linked to high plasma p-tau levels, irrespective of AD pathophysiology.

Objectives: To explore the relationship between qAlb and plasma p-tau181 concerning AD diagnosis, utilizing CSF p-tau181 as a reference point and construct a predictive model that combines qAlb and plasma p-tau181 to anticipate AD CSF profiles.

Materials and Methods: Participants were pooled from preceding studies on encephalopathy and from patients attending a memory clinic, which plasma and cerebrospinal fluid (CSF) were acquired. Stratifying participants based on binary plasma and CSF p-tau181 results, CSF/plasma albumin quotient (qAlb) were compared between false positive and non-false positive groups. Univariable linear regression predicting CSF p-tau181 from plasma p-tau181 was employed, facilitating the quantification of CSF p-tau residuals. The correlations between residuals and qAlb were examined. A multivariable logistic regression model incorporating qAlb and plasma p-tau181 to predict AD CSF profile was developed using encephalopathy participants and tested on the memory clinic patients.

Results: The study included 147 participants. The qAlb is significantly elevated in the plasma p-tau false positive group ($p=0.047$). A notable negative correlation exists between qAlb and CSF p-tau residuals (Spearman $\rho = -0.0986$, $p = 0.0347$). Plasma p-tau181 and qAlb predict AD in the memory clinic with the AUC of 0.78, not different from using p-tau alone ($p=0.86$).

Conclusion: BBB permeability influences the prediction of CSF p-tau181 from plasma p-tau181, notably leading false positive results. Conversely, integrating qAlb with plasma p-tau181 in the memory clinics did not seem to improve the performance of p-tau. Future investigations should explore the influence of other markers of BBB on plasma AD biomarkers.

Unraveling Plantar Pressure Dynamics in Parkinson's Disease with Freezing of Gait: Taking Steps through Its Characters and Predictive Factors

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Introduction: Freezing of gait (FOG) poses a significant challenge in advanced Parkinson's disease (PD), manifesting as abrupt interruptions or reductions in forward movement within the gait cycle. Despite its prevalence, the underlying mechanisms of FOG remain elusive. Plantar pressure, notably heel strike dynamics, has emerged as a pivotal parameter associated with FOG. This study aimed to elucidate plantar pressure characteristics in PD patients experiencing FOG and identify predictive factors for alterations in plantar pressure parameters.

Objectives: Elaborate on the characteristics of plantar pressure in PD patients with FOG, and identify significant factors predicting reductions in plantar pressure (total peak plantar pressure, plantar pressure in the heel-strike and plantar pressure in the push off) in PD patients with FOG.

Materials and Methods: A retrospective analysis was conducted on clinical data and Strideway[®] System records from PD patients diagnosed with FOG via gold standard objective gait measurement at Chulalongkorn Hospital between December 2021 and July 2022. Demographics, clinical assessments, plantar pressure metrics (heel strike, push off, force-time integral), and spatiotemporal gait parameters were collected. Analysis of plantar pressure characteristics across stages of PD was performed. Predictive factors for reductions in plantar pressure were identified by uni- and multivariate analyses.

Results: One hundred PD patients with FOG were included. Plantar pressure during the heel strike phase exhibited reductions in stages 2-3, with an increase noted in stage 4. Predictive factors for reduced plantar pressure in the heel strike included MDS-UPDRS part III scores (b -2.08 95%CI -2.96 – -1.19; $p < 0.001$), stride velocity (b 0.60 95% CI 0.05 – 1.15; $p = 0.032$), and gait variability, (b -0.69 95%CI -1.29 - -0.09; $p = 0.026$).

Conclusion: Our findings offer insights into patient monitoring and intervention strategies, particularly in H&Y stages 2-3, where targeted modifications of plantar pressure may alleviate FOG. Significant predictive factors could inform recommendations for interventions targeting disease severity, potentially improving FOG outcomes.

Correlation Between Multimodal Biomarkers and Changes in Gait Parameters in Patients Suspected of Idiopathic Normal Pressure Hydrocephalus

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Introduction: Normal pressure hydrocephalus (NPH) is characterized by a triad of gait disturbance, cognitive impairment, and urinary incontinence, with ventriculomegaly and normal lumbar cerebrospinal fluid (CSF) pressure. Idiopathic NPH (iNPH) presents a complex management challenge, often treated with ventriculoperitoneal shunt (VPS) placement. Managing iNPH is complicated by variable responses to CSF diversion, prompting a comprehensive assessment, especially regarding gait improvement. Gait impairment is prevalent in one in five individuals over 75, and its complexities, rooted in disruptions within the striato-frontal circuit, overlap with diverse diseases. Traditional CSF diversion may not uniformly benefit these conditions.

Objective: This study aims to elucidate the pathophysiological underpinnings of iNPH and its variable response to CSF diversion, with a specific focus on establishing correlations between pre-diversion multimodal biomarkers and subsequent gait parameter changes after fluid diversion.

Materials and Methods: Newly suspected iNPH patients undergoing CSF diversion were enrolled. Volumetric and visual MRI analysis, gait assessment, and biochemical assays were performed, encompassing CSF outflow resistance, neurodegenerative disease biomarkers, and MRI parameters.

Results: Thirteen participants (median age, 72 years) exhibited a noticeable shift in gait post-CSF diversion, with a clear correlation between knee and ankle flexion angles (Spearman's $\rho = 0.92$, $p < 0.001$). Elevated p-tau levels correlated with a less favorable gait response, potentially indicating diminished CSF diversion efficacy in Alzheimer's pathology. Conversely, lower p-tau levels aligned with a more favorable response, consistent with typical iNPH biomarker profiles. Unexpectedly, α S-SAA, a Parkinson's disease biomarker, showed discernible gait responses, challenging conventional norms.

Conclusion: The study unveils intriguing correlations between biomarkers, gait changes, and CSF diversion outcomes in iNPH. Elevated p-tau levels may indicate poorer responses, suggesting complex interplays between neurodegenerative conditions and treatment outcomes. Unexpected findings with α S-SAA imply possible dual pathology (Parkinson's disease and iNPH), adding complexity to diagnostic and therapeutic considerations. Limitations, including a small sample size, underscore the need for cautious interpretation, emphasizing avenues for future research development to refine predictive models and enhance clinical applicability.

Outcomes of Wake-Up Stroke in Mechanical Thrombectomy Era

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Introduction: A substantial portion of patients woke up with stroke, which were likely excluded for intravenous alteplase treatment due to unknown time of onset. Currently, mechanical thrombectomy (MT) is approved to treat eligible patients with large vessel occlusion (LVO) within up to 24 hours.

Objective: To study the causes and outcomes of patients with wake-up stroke as compared to non wake-up stroke.

Objectives: Prevalence and Outcomes of Patients with Wake-up Ischemic Stroke

Materials and Methods: Patients with acute ischemic stroke who were treated during September, 2022-March, 2023 were studied. All patients were investigated and treated according to the standard stroke protocol in the certified stroke unit. Baseline characteristics, causes and outcomes of the patients were compared between wake-up and non wake-up stroke.

Results: A total of 693 patients were included, with 138 patients (19.9%) presenting as wake-up stroke. The causes of stroke were non-significantly different between non wake-up and wake-up subgroups. MT was performed in 17% and 18% of patients with non wake-up and wake-up stroke, respectively. Intravenous alteplase alone was given in 14.2% of patients with non wake-up stroke, but none in the wake-up subgroup. Favorable outcome (mRS0-1) at 3 months revealed non-significant difference (non wake-up: 54% vs wake-up:55%, $p=0.83$). Slightly higher death rate (6.8% vs 2.2%, $p=0.037$) and symptomatic intracerebral hemorrhage (5.4% vs 1.4%, $p=0.188$) were found in non wake-up as compared to wake-up stroke.

Conclusion: In MT era, the favorable outcome in wake-up stroke patients did not significantly differ from that observed in non-wake-up stroke cases, despite none of wake-up stroke patients treated with intravenous alteplase alone.

Validation of TU-NMS Questionnaire, Prevalence, and Benefit of Botulinum Toxin Injection on Non-Motor Symptoms in Primary Craniocervical Dystonia

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Introduction: CCD is a group of disorders characterized by involuntary muscle contractions affecting the periocular, perioral, lingual, laryngeal, and cervical muscles. Each condition may appear in isolation or combined with other forms of CCD. Validated screening tool of NMS in Thai patients with dystonia is limited. Awareness of common features of NMS in CCD could improve patients' QOL.

Objectives: To validate the Thammasat University Non-Motor Symptoms Questionnaire (TU-NMSQuest) for screening non-motor symptoms (NMS) along with the prevalence and benefit of botulinum toxin injection on NMS in patients with craniocervical dystonia (CCD).

Materials and Methods: A prospective cohort study in 27 patients with CCD and 29 controls was conducted at Thammasat University Hospital. Demographic data, severity, NMS, and QOL were assessed pre and post botulinum toxin injection treatment. NMS and QOL were assessed using TU-NMS and Thai EQ-5D-5L questionnaire.

Results: TU-NMS showed high construct validity with DNMSQuest (rs 0.805) and moderate concurrent validity with EQ5D5L (rs 0.594). Patients with CCD reported an average of 11 NMS (range: 0-24). Insomnia was the most prevalent NMS. Severity of cervical dystonia by TWSTRS is also associated with number of NMS ($P = 0.0488$). There was no difference in NMS between dystonia subtypes. NMS and QOL were significantly improved after Botulinum toxin therapy.

Conclusion: Non-motor symptoms are common and affect QOL in CCD patients. The TU-NMSQuest could be used as a screening tool for evaluating NMS in Thai CCD patients. Treatment of dystonia with botulinum toxin could improve NMS, QOL, and overall well-being in patients with CCD.

Apixaban Concentration According to Creatinine Clearance for Stroke Prevention in Patients with Nonvalvular Atrial Fibrillation (ACCESS-AF study)

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Introduction: Apixaban is effective and safe for preventing stroke in the patients with nonvalvular atrial fibrillation (NVAF), and its usage has increased exponentially in recent years. Dose adjustment is based on creatinine level, regardless of creatinine clearance (CrCl). In addition, data concerning therapeutic range of apixaban is limited.

Objectives: The study aimed to determine plasma concentration of apixaban (peak and trough) in patients with both standard-dose and reduced-dose in association with creatinine clearance (CrCl ≥ 50 ml/min and CrCl < 50 ml/min).

Materials and Methods: A prospective observational study was conducted at Phramongkutklao hospital between July 2021 to January 2024. Patients with nonvalvular atrial fibrillation (NVAF) who received apixaban were enrolled. Plasma concentration (peak and trough) of apixaban were tested in individuals who on either standard-dose or reduced-dose. Furthermore, we evaluated apixaban concentration according to CrCl (CrCl ≥ 50 ml/min and CrCl < 50 ml/min).

Results: Total of 56 eligible patients were enrolled. Thirty-two patients received standard-dose apixaban and 24 patients received reduced-dose apixaban with 75% fulfilled reduced-dose criteria. The median peak and trough levels in patients with CrCl < 50 mL/min were 210.23 and 165.70 ng/mL standard-dose group and levels in reduced-dose were 191.01 and 134.19 ng/mL respectively. In patients with CrCl ≥ 50 mL/min, the levels in standard-dose group were 211.74 and 140.50 ng/mL and in reduced-dose group were 89.11 and 82.27 ng/mL respectively.

Conclusion: There was significant difference between peak and trough concentration of reduced-dose apixaban in patients with CrCl ≥ 50 mL/min. To reduce apixaban dose, not only fulfilled the manufacture recommendation, but also concerning of creatinine clearance is important.

Sympathetic Hyperactivation as an Alternative Treatment of Orthostatic Hypotension in Parkinson's Disease: An Initial Report of an Ongoing Randomized Control Study

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Background: Orthostatic hypotension (OH) is a common non-motor condition in Parkinson's disease (PD). For these individuals, pyridostigmine and midodrine have not been well compared.

Objective: To determine the safety and short-term effectiveness of pyridostigmine monotherapy in comparison to midodrine for individuals with Parkinson's disease who met the criteria for orthostatic hypotension (OH).

Materials and Methods: An open label, randomized clinical study was conducted. A total of thirteen PD patients with OH were enrolled and randomized to receive midodrine (5 mg/day) or pyridostigmine (120 mg/day) over a two-week period. The primary objective measured the degree of improvement in OH in two weeks. The secondary outcomes include changes in supine blood pressure (BP), supine heart rate (HR), and the proportion of patients who meet the BP criteria for OH. Note that this report was an interim analysis.

Results: The orthostatic BP of both groups was improved over two weeks. In comparison between groups, systolic blood pressure changes during supine to upright position were -14.6 mmHg and -15.4 mmHg for pyridostigmine and midodrine group, the orthostatic systolic BP (SBP) drop was significantly lower in the pyridostigmine group ($p = 0.029$ for pyridostigmine group and $p = 0.048$ for midrodrine group). The changes in orthostatic HR, supine SBP, supine DBP, and supine HR did not significantly differ between the two groups. Mild to moderate side effects were observed by five participants. While 42.9% of patients using midodrine met the BP criteria for OH, 33.3% of patients taking pyridostigmine did.

Conclusion: When treating orthostatic hypotension in Parkinson's disease patients, a single Pyridostigmine treatment was found to be safe and to be non-inferior to low dose Midodrine. Furthermore, it was discovered that pyridostigmine was better than midodrine in terms of enhancing orthostatic SBP change and reducing the number of OH patients.

Psychiatric and Behavioral Problems in Patients with Epilepsy in Phramongkutklao Hospital: A Retrospective Survey

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Background: Psychiatric and behavioral problems, either from disease itself or treatment related, affect quality of life and treatment compliance for patients with epilepsy.

Objectives: To survey the prevalence and risk factors of psychological and behavioral problems among patients in our Neurological clinic.

Materials and Methods: This was a retrospective cross-sectional study conducted in 2023. The data including patient characteristics, HAM-A, PHQ-9, EQ-5D-5L, ESS, and the Distress Thermometer were collected and analyzed.

Results: Total of 52 participants (mean age 46.79 years, relatively high educational levels, well seizure controlled) were included. The average duration of epilepsy and ASMs treatment was 11 years. By using PHQ-9, 3.8% of patients had a score of ≥ 10 representing depression. Eight percent of patients having anxiety detected by HAM-A score. The EQ-5D showed 34.62% reported utility score problems. It was found that anxiety and depression were correlated with poor Utility score, $p = 0.011$. Only one patient experienced excessive daytime sleepiness, notably in the patient with anxiety. There was no associated between psychiatric/behavioral problems and demographic data.

Conclusion: The prevalence of psychological and behavioral problems in patients with epilepsy was 8% for anxiety and 4% for depression. Anxiety and depression affected quality of life.

The Effect of Nicergoline on the Treatment of Dysphagia in Chronic Neurological Disorders: A Preliminary Analysis of a Randomized Controlled Trial

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Introduction: Dysphagia impacts the quality of life, posing risks such as aspiration pneumonia, particularly in patients with chronic neurological disorders. Nicergoline has a mechanism that improves dysphagia.

Objectives: To determine efficacy and safety of nicergoline in improving dysphagia symptoms in patients with chronic neurological disorders

Materials and Methods: This is a 3-month, single-center, open-label, randomized controlled trial comparing low dose (20mg/d) and high dose (60 mg/day) of nicergoline. Outcome measurements were changing of the Gugging Swallowing Screen (GUSS) score, choking, drooling and subjective dysphagia and adverse events.

Results: A total of 14 participants, mean age of 69.1 years old, and 8 male (57.1%), seven in each group, there was no statistic significant in demographic between groups. The GUSS scoring in the high-dose group was significantly increased at 1 and 3 months compared to baseline (16.57 ± 5.2 vs. 14.00 ± 4.6 , $P=0.002$; 18.82 ± 1.8 vs. 15.14 ± 3.4 , $P<0.001$, respectively). In the low-dose group, there was a significant improvement in GUSS score at 1-month compared to baseline (16.57 ± 5.2 vs. 14.00 ± 4.6 , $P=0.002$). There was no statistically significant difference in GUSS score between the two groups. Choking and drooling were also improved. Two participants in the high-dose group and one in the low-dose group experienced headaches. One participant in the high-dose group developed asymptomatic hyperuricemia.

Conclusion: Nicergoline both low-dose (20 mg/day) and high-dose (60 mg/day) improved the swallowing score and subjective swallowing performances with good tolerability.

Prevalence and Associated Factors of Ischemic Stroke in the Young Patients

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Introduction: Ischemic stroke can cause major disability in any patient affected. Ischemic stroke in the young patients in Rajavithi hospital have not been well studied. The aim of this study was to determine prevalence and associated factor of ischemic stroke in the young patients.

Objectives: 1. To study the prevalence of ischemic stroke in the young patients in Rajavithi hospital.
2. To study any factors associated with acute ischemic stroke in the young patients.

Materials and Methods: Retrospective cross-sectional study used collected data from ischemic stroke patients admitted in Rajavithi Hospital during July 1, 2021 - June 30, 2023.

Results: From 770 ischemic stroke patients, 100 patients (12.99 %) were stroke in the young (age \leq 45years). Their mean age was 37.56 + 7.52 years old. Fifty-five patients (55%) were male. Mean BMI in stroke in the young group is 25.99 + 5.39kg/m², which is statistically significantly higher than in the older group(p=0.003). Hypertension is statistically significant(p<0.001) more common in stroke in the young group. According to Trial of Org 10172 in Acute Stroke Treatment (TOAST) classification, type of strokes was undetermined in 32%, large artery atherosclerosis in 25%, small artery occlusion in 21%, other determined cause in 15% and cardioembolism in 7% of ischemic stroke in the young patients.

Conclusion: Prevalence of ischemic stroke in the young is 12.99% among all stroke patients. Stroke of undetermined etiology was the most common type. Further prospective study in a larger population with more complete investigations is needed.

Incidence and Association of 30-day Recurrent Stroke in Ischemic Stroke Patients Who Received DAPT (dual antiplatelet therapy) in Rajavithi hospital

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Introduction: Ischemic stroke ranking as the third leading cause of death in Thailand. It contributes to social and economic burdens and disability due to recurrent hospitalizations. The treatment of choice for patients with minor strokes or transient ischemic attacks is dual antiplatelet within the first 21 days then switch to single antiplatelet.

Objectives: 1. To investigate the incidence of recurrent acute ischemic stroke within 30 days whom treated with dual antiplatelet therapy.

2. To find association for the incidence of recurrent ischemic stroke within 30 days whom treated with dual antiplatelet therapy.

Materials and Methods: Retrospective cross-sectional study used collected data from patients who received dual antiplatelet with recurrent ischemic stroke in 30 days in Rajavithi Hospital during June 1,2021 - June 30,2023

Results: From 406 patients, the incidence of recurrent stroke is 8.4% and LDL is the only associated factor of 30-day recurrent stroke in ischemic stroke patients who received DAPT ($p=0.045$). There is no statistic significant association of incidence for risk recurrent stroke in gender, age, smoking, any inclusion underlying diseases, hormonal usage, DTX, HbA1c, SBP, brain parenchymal study, vascular study stroke protocol or TOAST classification.

Conclusion: The study result shows that 8.4% got recurrent stroke and the only significant risk factors is LDL. Further factors might be significant if the number of the populations and duration of the study increased.

Prevalence and Risk Factors for Post Stroke Depression in Patients with Acute Ischemic Stroke in Rajavithi Hospital

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Introduction: Acute ischemic stroke is a significant health burden in Thailand. Based on previous records, the prevalence of acute ischemic stroke is 1.88% among Thai individuals aged 45 and above. It is a leading cause of death, with 50-60% of stroke survivors experiencing persistent disability. According to multiple studies the prevalence of post stroke depression is higher than normal population. Risk factors for post stroke depression include pre-existing psychological issues, female gender, age below 70, severity of acute ischemic stroke and the extent of disability established after the stroke event. Survivors of stroke with post stroke depression exhibit a lower quality of life compared to those without depression.

Objectives: To assess the prevalence and risk factors of post stroke depression in patients with acute ischemic stroke in Rajavithi hospital

Materials and Methods: This study is cross sectional study. The study protocol was approved by Rajavithi Research ethics committee. Participants recruitment occurring between January 1st, 2022 to December 31st, 2023.

Results: In the participated individuals, the majority of the participants experienced mild stroke and mild disability. There is no occurrence of post stroke depression among patients with acute ischemic stroke at Rajavithi hospital.

Conclusion: Acute ischemic stroke is not significantly associated with higher prevalence of depression compared with normal population. The study outcome is different from earlier study. The data from this study can be applied with other study in the future to reevaluate post stroke depression status.

Canine Olfactory Detection in Parkinson Disease: An Exploratory Study

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Introduction: Dogs possess an exceptional sense of smell, have applications in law enforcement and medicine, particularly in screening for medical conditions. This study investigates the potential of sniffer dogs in diagnosing Parkinson's disease (PD).

Objectives: This is an exploratory phase 1 study to prove and ensure that capability of the dogs after the training in identification of PD samples before conducting phase 2 study.

Materials and Methods: This prospective study comprises two phases. In this phase 1 study, sniffer dogs were trained using samples from individuals with PD and a control group. Samples were collected from masks and the upper backs of each participant using gauze swabs. At the end of the Phase 1 study, breath and skin swab samples from both PD patients and controls were used to test the dogs for their capability to identify PD specimens. Testing the dogs' accuracy with blinded samples collected from patients that will commence after the completion of this phase 1.

Results: In the phase 1 study involving 40 participants, including 10 with PD and 30 controls, sniffer dogs demonstrated significant potential in detecting PD through breath and skin swab samples. Dog 1 showed a positive detection rate of 70% for breath samples and 60% for skin swabs when the criterion of correctly identifying PD specimens in all three attempts was used, while Dog 2 exhibited higher accuracy rates of 90% and 100%, respectively. When the criteria for a positive detection were less stringent (at least 2 out of 3 correct identifications), both dogs achieved a 100% detection rate across all tests. The study also explored stricter criteria, such as agreement between the two dogs or across specimen types, leading to varied rates of positive detection. This variance underscores the potential of utilizing sniffer dogs for PD diagnosis, contingent on the criteria set for a "correct" detection.

Conclusion: Sniffer dogs have shown remarkable efficacy in detecting PD through both breath and skin swab specimens, following comprehensive training. This initial phase 1 study lays the groundwork for advancing to the next phase, where a more thorough evaluation will be conducted. The forthcoming phase 2 study aims to assess the sensitivity, specificity, and overall accuracy of sniffer dogs in PD diagnosis. Additionally, it will explore the feasibility of integrating this non-invasive diagnostic method into clinical practice, potentially offering a novel approach to PD screening.

Effect of Prior Statin Therapy on Outcomes in Large and Medium Vessel Occlusion Stroke with Endovascular Thrombectomy

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Introduction: The influence of prior statin therapy uses on the outcomes of patients with acute ischemic stroke treated with endovascular therapy is unclear. We compared procedural and clinical outcomes of endovascular therapy in patients on statin therapy or not before stroke onset.

Objectives: To assess effect of prior statin therapy on outcome in large and medium vessel occlusion stroke with endovascular thrombectomy

Methods: A retrospective observational study of 168 patients diagnosed with acute ischemic stroke within 7 days and received endovascular therapy with or without intravenous thrombolysis was conducted in Ramathibodi hospital between January 1, 2013 and December 31, 2022. Baseline characteristics, comorbidities, clinical and radiographic features, treatment were collected. Patients were divided into three groups according to statin therapy status category as patients without prior statin (no statin), patients with prior high intensity statin therapy (HIS) and patients with prior low or moderate intensity statin therapy (LIS). Multilevel mixed-effects logistic models including center as random effect were used to compare angiographic (rates of reperfusion at the end of procedure, procedural complications) and clinical outcomes according to statin subgroups. Comparisons were adjusted for prespecified confounders (age, admission National Institutes of Health Stroke Scale score, Alberta Stroke Program Early CT Score, intravenous thrombolysis, and time from onset to puncture), as well as for meaningful baseline between-group differences.

Results: A total of 168 patients were analyzed, of whom 97 patients (58%) had never taken any statin, 25 patients (15%) were on HIS and 46 patients (27%) were on LIS. No significant difference in recanalization rates, number of passes and periprocedural complication was found between patients with high intensity statin and without statin. Patients without statin therapy, HIS and LIS had similar discharge mRS and 90 days mRS, parenchymal hematoma. Symptomatic ICH is significantly higher in the high intensity statin group, compared with no statin group [OR 1.725 (95% CI, 3.5-11);P value = 0.003].

Conclusion: This study demonstrates the neutral effect of statin treatment with angiographic outcomes and clinical outcomes in acute ischemic stroke patient undergoing endovascular thrombectomy with or without intravenous thrombolysis.

Prognostic Factors for Early Neurological Deterioration in Acute Ischemic Stroke Patients with Medium- or Large-Vessel Occlusion

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Objectives: To identify the prognostic factors for early neurological deterioration in acute ischemic stroke patients with medium- to large-vessel occlusion.

Materials and Methods: In this retrospective cohort study, patients diagnosed with acute ischemic strokes with symptomatic medium- or large-vessel occlusion in Ramathibodi Hospital between January 1, 2012, to September 31, 2023 were eligible for study inclusion. Baseline characteristic, clinical, laboratory data, radiographic and treatment data were collected. The primary outcome was early neurological deterioration (END), defined as 2 or more points deterioration on National Institute of Health Stroke Scale (NIHSS) score within the first 24 hours.

Results: The study cohort included 571 patients (293 women [51.2%]; mean age, 68 years). It was found that there was a total of 144 cases of END, accounting for 25.3%. In multivariable analysis, Factors contributing to the occurrence of END were age (odds ratio [1.023]; 95% CI, 1.008-1.037; $p=0.001$), non-dependence status before hospitalization (odds ratio [1.773]; 95% CI, 1.083-2.905; $p=0.023$), ICH (odds ratio [2.181]; 95% CI, 1.104-4.309; $p=0.007$)

Conclusions: Factors associated with occurrence of END include age, non-dependent status and intracerebral hemorrhage. There is a trend suggesting that delayed treatment is associated with a higher likelihood of END. Furthermore, if END occurs, it is associated with an increased risk of future disability.

TMSE Performance in Patient with Parkinson's Disease According to MoCA Score in Detecting Mild Cognitive Impairment

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Background: Mild cognitive impairment (MCI) is a common feature of Parkinson's disease (PD), occurring in about 30-40% of patients over age 65 years, which may progress to Parkinson's disease dementia. Routine cognitive assessment is important to evaluate and properly manage PD patients with MCI. To date, multiple cognitive screening tools have emerged, such as the Montreal Cognitive Assessment (MoCA) and Thai Mental state exam (TMSE). TMSE has been widely adopted due to its convenience and quick assessment, however its validity has not been established.

Methods: A representative sample of 100 patients with PD at Vajira Hospital was screened for MCI with MoCA and TMSE. Patients with dementia and advanced PD stage were excluded from the study. The TMSE performance for detecting MCI in patients with Parkinson's Disease according to MoCA were analyzed for the sensitivity and specificity. New optimal cutoff points were evaluate using the Youden's index.

Results: Among patients with MCI (N=81) according to the MoCA test, 19 patients (23.5%) met the criteria diagnosis for MCI by TMSE test while 62 patients (76.5%) do not meet the criteria for MCI by TMSE test. The sensitivity was 23.5% (95%CI: 14.8 - 34.2) and specificity was 100% (95%CI: 82.4 - 100). Positive predictive value was 100% (95%CI: 82.4 - 100) and negative predictive value was 23.5 (95%CI: 14.8 - 34.2). The accuracy was 38.00 (95%CI: 28.5 - 48.3). The optimal cutoff points value for TMSE is <28 with sensitivity of 77.8% (95%CI: 67.2 - 86.3) and specificity of 100% (95%CI: 82.4 - 100).

Conclusions: The TMSE test failed (low sensitivity) to detect most of the patients with MCI diagnosed by the MOCA test. However, the optimal cutoff points value of TMSE score <28 showed better sensitivity and positive predictive value.

Prevalence and Associated Factor of PD-MCI in Parkinson's Disease in Urban Population

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Objectives: Mild cognitive impairment associated with Parkinson's disease (PD-MCI) is a risk factor for developing dementia in Parkinson's patients. Early identifying PD-MCI in clinical practice is crucial for implementing appropriate preventive interventions, such as cognitive training. Previous studies have reported the prevalence of PD-MCI in general population ranging from 20% to 70%. However, there is lack of this data in urban population. Thus, this study aimed to evaluate the frequency and associated factors of MCI in Urban PD subjects.

Materials and Methods: A total of 100 mild to moderate PD participants who have not been diagnosed with dementia were included in this study. They were screened for mild cognitive impairment (MCI) using the Montreal Cognitive Assessment (MoCA). The prevalence of MCI in PD subjects was calculated, and multiple logistic regression models were used to assess the association between MCI and PD. The results were shown as odds ratios (OR) with 95% confidence intervals (CI).

Results: Of 100 eligible participants aged between 65 and 74 years, 43% were male, and 54% were female. The prevalence of mild cognitive impairment (MCI) in patients with Parkinson's disease was 81%.

The factors which significantly associated with MCI in patients with Parkinson's disease were Age ≥ 70 years old (adjusted OR [95% CI]= 6.77 [1.35-34.08]; p-value 0.020) ,

The education level which below grade 6 (adjusted OR [95% CI]= 10.35 [1.68-63.88]; p-value 0.012) and obesity which BMI ≥ 25 kg/m² (adjusted OR [95% CI]= 0.07 [0.01-0.55]; p-value 0.012)

Conclusion: The prevalence of mild cognitive impairment in urban patients with Parkinson's disease was 81% which was higher than the prevalence of this condition in general population. The factors associated with PD-MCI in urban population were age, low education level and BMI more than 25.

The Incidence and Associated Risk Factor of Postencephalitic Seizures and Postencephalitic Epilepsy

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Introduction: Postencephalitic seizure and postencephalitic epilepsy are associated with an increase in morbidity and mortality. Currently, there is limited data in Thailand regarding the incidence and associated risk factors for postencephalitic seizure and postencephalitic epilepsy.

Objectives: To investigate the incidence of postencephalitic seizure and postencephalitic epilepsy among Thai people, and to identify associated risk factors for postencephalitic seizure and postencephalitic epilepsy.

Methods: This study aimed to investigate all patients who experienced acute encephalitis at the Faculty of Medicine Vajira Hospital between January 1, 2013, and December 31, 2022. The patients manifesting seizures were classified into two groups: the postencephalitic seizure group and the postencephalitic epilepsy group based on the ILAE definition.

Results: Out of 197 patients with no history of epilepsy who presented with acute encephalitis, 41 patients (20.8%) developed seizures. Specifically, there were 20 patients (10.1%) in the postencephalitic seizure group and 21 patients (10.6%) in the postencephalitic epilepsy group. From the multivariable analysis, patients aged 60 years or younger were more likely to develop seizures compared to those without.

Conclusion: The incidence of postencephalitic seizures and postencephalitic epilepsy was found to be 10.1% and 10.6%, respectively. Age ≤ 60 years old was associated with the occurrence of seizures when compared with patients without seizures. Due to the low incidence of seizures, predicting potential predictors for postencephalitic seizures and postencephalitic epilepsy is not currently possible in this study.

Audiometric Hearing Level in Patients with Clinical Spectrum of Cognitive Impairment

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Objective: This research aims to investigate the audiometric hearing level in individuals within the spectrum of cognitive impairment, from normal cognition, subjective cognitive impairment (SCD), mild cognitive impairment (MCI) to mild dementia.

Introduction: Prior research has established a correlation between hearing loss and cognitive impairment, with a primary emphasis on the association with dementia, followed by MCI. However, there is limited research on individuals with SCD, and no studies in this regard have been identified in Thailand.

Material and Method: A total of 135 participants were recruited and categorized into four groups as follows: normal (33 participants), SCD (36 participants), MCI (34 participants), and mild dementia (33 participants). We assessed cognition through the Montreal Cognitive Assessment (MOCA), Cognitive Change Index, both self (CCI-S) and informant-report (CCI-I). All participants underwent tonal audiometry. Data on cognitive tests and audiometry parameters in each diagnostic group were analyzed.

Result: A consistent finding was a significant decrease in all hearing parameters—air-conduction, bone-conduction hearing threshold, high frequency hearing threshold, speech recognition threshold, and word recognition testing—in the mild dementia group compared to the other groups (all $P < 0.001$). No statistically significant differences in hearing were noted between the normal, SCD, and MCI groups. Age, years of education, and comorbidity were identified as a significant factor influencing hearing impairment. MoCA and CCI-I scores demonstrated a significant association with hearing levels, while the CCI-S did not. However, these associations became insignificant after controlling with age. Participants with mild dementia exhibited poorer hearing compared to those without dementia, even after adjusting for age and education ($p = 0.013$).

Conclusion: The hearing threshold increases significantly in individuals with a more cognitive difficulty. Individuals with mild dementia display significantly worse hearing than those without. Screening for hearing in the spectrum of cognitive impairment may be necessary, especially in individuals with mild dementia

Cost-Utility Analysis of Mobile Stroke Unit in Thailand

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Introduction: Acute ischemic stroke (AIS) can be treated with intravenous thrombolysis within 4.5 hours. A mobile stroke unit (MSU) was developed with the aim of reducing the onset-to-treatment time and increasing the rate of AIS patients receiving intravenous thrombolysis. However, the cost of the MSU is still high, and there have been limited economic evaluations.

Objectives: This study aimed to conduct a cost-utility analysis of AIS patients arriving at the hospital via MSU, emergency medical service (EMS), and walk-in (WI).

Materials and Methods: The AIS patients were enrolled in Siriraj Hospital from 18 May 2018 to 31 December 2022. The transitional probabilities and costs were collected from the patients. Only MSU data were obtained from the other five hospitals for comparison of service. Patient utility was assessed using the EQ-5D-5L questionnaire. The decision tree was generated for three-month period and entered the Markov model with three-month cycle length until the patient's lifetime.

Results: The cost of MSU was the highest (634,819 THB), followed by WI (491,228 THB), and EMS (489,665 THB). Both the life-year and quality-adjusted life-year (QALY) were highest in MSU (5.99, 5.26) and lowest in EMS (5.33, 4.49). The cost-effectiveness analysis indicated that MSU was not a cost-effective option at Thailand's willingness-to-pay threshold of 160,000 THB/QALY when compared to EMS and WI at Siriraj Hospital and other hospitals. The one-way sensitivity analysis demonstrated an increased number of MSU services resulted in cost reduction.

Conclusion: The MSU was not cost-effective in Thailand setting, but it depended on the number of AIS patients using the MSU service.

Prevalence and Risk Factors of Myasthenia Gravis Exacerbation Related to COVID-19 Vaccination at Siriraj Hospital

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Objective: To study the prevalence and risk factors of MG exacerbation in relationship to COVID-19 vaccination at Siriraj Hospital.

Introduction: Various risk factors contribute to MG exacerbation, including infections, medications, and vaccination. In Thailand, 2.5 million people were affected by COVID-19 infection by the end of 2022. After COVID-19 vaccine approval, reports emerged of adverse events, particularly neurological complications. Despite Thailand's diverse use of COVID-19 vaccines and regimens, documentation of adverse events in MG patients in Thailand is lacking.

Materials and Methods: Our team conducted an observational retrospective study at Siriraj Hospital, Mahidol University, Thailand, to answer this issue. The data of patients in our MG clinic database from the established clinic until 31 December 2023 was reviewed. All patients who met the inclusion criteria were interviewed in person or via phone for information regarding COVID-19 vaccination and MG symptoms after the vaccination.

Results: Data collected from 209 MG clinic patients who attended the clinic from December 2019 to December 2023 revealed three episodes of MG exacerbation within six weeks after vaccination from a total of 633 vaccine events, comprising 0.47% of all COVID-19 vaccination events. Notably, two episodes of MG exacerbation occurred after the second dose, and one arose after the first. The factors associated with MG exacerbation after COVID vaccination from univariate analysis of patients with thymic carcinoma and patients with higher prednisolone dosage

Conclusion: From the results of our study, given the low prevalence of MG exacerbation, MG patients should be encouraged to have COVID-19 vaccination with only minor concerns for MG exacerbation.

Risk Factors for Myasthenia Crisis and Disease Exacerbation in Myasthenia Gravis Patients at Siriraj Hospital

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Objective: This study aims to identify risk factors associated with exacerbations and crises in myasthenia gravis patients, comparing those who experienced these events to those who did not. Secondary objectives include event incidence, patient characterization, precipitating causes examination, and assessment of immunosuppressive agents' impact.

Introduction: Myasthenia gravis, an autoimmune neuromuscular disorder, affects approximately 12.4 per 100,000 individuals worldwide, leading to muscle weakness that may progress to life-threatening exacerbations or myasthenic crises. Factors contributing to these events remain inadequately understood in Thai patients, necessitating investigation to address this knowledge gap.

Materials and Methods: A case-control study conducted at Siriraj Hospital's Myasthenia Gravis Clinic included patients with confirmed myasthenia gravis diagnoses, follow-up ≥ 3 years, and age ≥ 18 years. Risk factors for Myasthenia Crisis (MC) and disease exacerbation were identified using a multivariate Cox regression model with follow-up duration.

Results: Among 429 patients, 51% of the patients experienced exacerbations or crises, with thymoma presence significantly elevating the risk. The highest incidence was within the first-year post-diagnosis. Early immunosuppressive treatment, particularly azathioprine, was associated with reduced risk of MC and disease exacerbation within the initial year.

Conclusion: This study underscores thymoma as a significant risk factor for myasthenia gravis exacerbations and crises. Ocular MG at onset, early disease onset, and other autoimmune diseases did not significantly increase risk. The peak incidence within the first year emphasizes the need for vigilant monitoring. Early immunosuppressive treatment, particularly with azathioprine, may offer benefits in risk reduction during the initial years. These findings contribute to the understanding and management of myasthenia gravis

The Result of Utilizing rTMS with Cognitive Training in Alzheimer Patients: A Pilot Study and Review Literature

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Introduction: rTMS holds promise in modulating brain plasticity and potentially augmenting cognition when combined with cognitive training. This study aimed to assess the effectiveness of rTMS with cognitive training on cognition and gait in mild to moderate Alzheimer's disease (AD) patients.

Methods: This retrospective chart review utilized data from the prior study titled "New Treatment for Alzheimer Patients Using Repetitive Transcranial Magnetic Stimulation with Cognitive Training: A Pilot Study." We examined the effect of rTMS combined with cognitive training in 9 AD patients. The rTMS protocols were targeted on the six cortical areas (Broca's area, Wernicke's area, both dorsolateral prefrontal and parietal somatosensory cortices) with 10 Hz, 20 trains and 5 days/week for 6 weeks. TMSE, MOCA, NPT, dual-task gait performance and Thai-ADL scores were measured pre- and post-stimulation at 6 months. The primary outcome was improvement of the cognitive score. The secondary outcome included improvement in Thai-ADL score, Neuropsychiatric Inventory(NPI) and dual task gait performance.

Results: There was a trend to improve in TMSE and MOCA at 6 months post-stimulation compared with baseline in the treatment group (22 and 24 VS 12 and 16.5 for TMSE and MOCA respectively). However, there were no statistical significance in improvement of TMSE and MOCA ($P = 0.059$ VS $P=0.058$ for TMSE and MOCA respectively). There was a statistical significance improvement in logical memory, visual memory, VOSP and BNT in treatment arm at 6 months. Regarding dual-task gait performance, step length showed improvement in both feet between the treatment and control arms at 6 months, with no notable effects on Thai-ADL scores.

Conclusion: This study suggests that rTMS with cognitive training represents an innovative, safe, and effective medical intervention for treating AD, particularly during the mild stages of the disease.

Visual Recovery after Demyelinating and Idiopathic Optic Neuritis at Siriraj Hospital

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Introduction: Numerous studies have emphasized on optic neuritis (ON) associated with demyelinating disease, although idiopathic ON (I-ON) seems to be common in Thailand. Information to compare demyelinating and I-ON is scarce.

Objectives: To assess visual acuity recovery at 6 months after ON in demyelinating and I-ON, and to study the factors influencing visual recovery.

Materials and Methods: Retrospective cohort study in university-based hospital was conducted, enrolling patients aged 18 or more with first ON episode between 2011 and 2022. Then they were categorized into ON associated with multiple sclerosis (MS-ON), neuromyelitis optica (NMO-ON), myelin oligodendrocyte glycoprotein antibody disease (MOG-ON), and I-ON. Relevant clinical parameter, ancillary testing, and MRI findings were gathered.

Results: Sixty patients with first episodes of ON were included. I-ON shared several features with MOG-ON, including color deficits, optic disc edema, peripapillary hemorrhage, and lower burden of supratentorial lesions. Perimetry and optical coherence tomography failed to distinguish types of ON. MS-ON has the best VA, while NMO-ON had the poorest VA at nadir. After treatment with steroids, ON recovered mostly within the first months, although NMO-ON continued to recover to some extent at 3 months. MOG-ON showed the greatest degree of recovery, while I-ON regained to the same degree as NMO-ON. MOG-ON and NMO-ON posed the highest risk of recurrence.

Conclusion: MS-ON tended to exhibit better VA at nadir and 12 months. Recovery of vision occurred early after treatment, I-ON shared some features with MOG-ON, but it rarely recurred and had poor response to treatment and slight recovery.

5-Year Experiences in Acute Stroke Management with Siriraj Mobile Stroke Units

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Introduction: The Mobile Stroke Units (MSUs) represents a novel solution for enhancing prehospital stroke management, demonstrating improved clinical outcomes at 3 months, increased accessibility, and shortened time to receive reperfusion therapy. However, data on the application of MSUs in underserved areas of Thailand remains unknown.

Objective: This study aims to evaluate clinical outcomes and time process measures in MSUs operations at Siriraj Hospital and seven underserved areas across Thailand.

Material and Methods: This retrospective study included patients aged ≥ 18 who underwent MSUs operations from 2018 to 2023. The primary clinical outcome was the rate of achieving an independent status, defined by a modified Rankin Scale (mRS) score of 0 to 2 at 3 months. Time process measurements, including door-to-needle (DN) time and the rate of receiving reperfusion therapy, were collected.

Results: The majority of patients (56.5%) achieved mRS score of 0-2 at 3 months. DN time had a mean \pm SD of 21 ± 11 minutes, exhibiting variations across sites but no statistically significant difference compared to Siriraj site. Additionally, 40.2% of patients received intravenous thrombolysis.

Conclusion: Even in rural areas without experience in treating acute stroke, introducing Mobile Stroke Units operation represents a paradigm shift in managing acute stroke. This innovation has demonstrated increased accessibility to reperfusion therapy, shortened door-to-needle time, and achieved favorable outcomes at 3 months.

Glutamate Receptor Expression in Astrocytoma Tissue from Patient with and without Seizure

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Introduction: Numerous studies have been conducted on the frequency of seizures in astrocytoma patients. This connection underlines how important it is to understand the relationship between astrocytomas and seizures, both for therapeutic as well as diagnostic reasons.

Objectives: To investigate the potential association between somatic gene mutations and the incidence of seizures in astrocytoma patients.

Materials and Methods: We collected 20 fresh frozen tissue surgical specimens from astrocytoma patients. Half of these patients (n = 10) experienced seizure after tumor removal surgery, while the other half (n = 10) did not. DNA extraction and whole-exome sequencing were performed to identify and compare the proportion of affected patients with somatic mutations in each gene among these two groups.

Results: The ionotropic glutamate receptors, categorized into AMPA, kainate, and NMDA receptors were found in 2 and 2, 4 and 2, and 7 and 7 patients between seizure and non-seizure group, respectively. Similarly, for the metabotropic glutamate receptors, the presence of these genes was found to be comparable between the seizure and non-seizure groups, with no statistically significant differences identified ($p > 0.05$).

Conclusion: Our study found no significant difference in somatic mutations between the seizure and the non-seizure group in astrocytoma patients. The lack of difference in somatic mutations between these two groups suggests that the etiology of seizures in this population is complex and not solely determined by this gene.

Predictors of Seizure in Patients with Cerebral Venous Thrombosis among Thai Population

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Purpose: We aim to define the independent factors contributing to acute symptomatic seizure (ASS) among cerebral venous thrombosis (CVT) patients.

Methods: This is a retrospective cohort study recruiting patients diagnosed with CVT admitted hospital between 2002 and 2020. The demographic data, clinical presentations, seizure characteristic, neuro-imaging findings and clinical outcomes were compared between the seizure and non-seizure group. The factors with p-value < 0.05 in univariate analysis were entered into multiple logistic regression analysis for determining the independent predictors of ASS.

Results: Among 180 CVT patients, the incidence of ASS was 38.33 %. Almost seizure presented as an initial symptom. Focal onset with secondary generalized tonic clonic seizure was the most common seizure semiology (82.61%). The recurrent serial seizure accounted for 56.52% and 8.70% developed non-fatal status epilepticus. The intracerebral hemorrhage (adjusted odd ratio [aOR] 6.570, p=0.001, 95% C.I. 2.246 to 19.213) and dependency status at admission (aOR 3.317, p=0.036, 95% C.I. 1.080 to 10.175) were the independent predictors of ASS, whereas isolated increased intracranial pressure (aOR 0.049, p<0.001, 95% C.I. 0.010 to 0.238), isolated headache (aOR 0.103, p=0.002, 95% C.I. 0.024 to 0.447), straight sinus (aOR 0.027, p=0.007, 95% C.I. 0.002 to 0.371) and cavernous sinus thrombosis (aOR 0.500, p=0.012, 95% C.I. 0.005 to 0.525) showed preventive effect.

Conclusion: Intracerebral hemorrhage and dependency status at admission were the independent predictors of seizure, whereas isolated increased intracranial pressure, isolated headache, straight sinus and cavernous sinus thrombosis showed preventive effect.

Incidence and Clinical Characteristics of Acute Ischemic Stroke or Transient Ischemic Attack following Whole Cell COVID-19 Vaccination (CoronaVac) in Southern Thailand

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Objective: To report (1) the incidence and (2) clinical characteristics of acute ischemic stroke (AIS) or transient ischemic attack (TIA) after CoronaVac vaccination in Southern Thailand

Background: In late 2019, there was a pandemic of COVID-19 infection worldwide. In February 2021, Department of Disease Control of Thailand announced that CoronaVac (by Sinovac Biotech) was a first vaccine approved for emergency use authorization. AIS, a rare vaccination-related event was reported in many COVID-19 vaccines. However, there was limited data of post-vaccination ischemic stroke related to CoronaVac.

Materials and Methods: This is a multicenter study including 12 medical centers which had neurologist in Southern Thailand. The study included patients with 18-years old or more who developed AIS or TIA after CoronaVac vaccination between April and July 2021. Acute ischemic stroke or TIA was diagnosed by neurologist according to clinical manifestations occurring within 30 days post-vaccination and brain imaging was done. The clinical characteristics were described. The incidence was analyzed as events per 1,000,000 doses.

Results: There were 68 patients who developed AIS or TIA after CoronaVac vaccination which accounted for an incidence of 177.3 events per 1,000,000 doses. Most of the patients were female (79.4%) with median age of 35.5 years (IQR, 29-42.5). The most common manifestations were numbness (80.8%), followed by weakness (42.6%), dysarthria (8.8%) and facial palsy (5.8%). The NIHSS 0-4 was found in 98.5%. Most of the patients recovered within 30 days.

Conclusions: The study reported an incidence of AIS or TIA after CoronaVac vaccination. The most common presenting symptom was hemi-sensory. The severity was mild and most of them recovered within one month.

The Impact of COVID-19 Infection and Vaccination on Multiple Sclerosis (MS) and Neuromyelitis Optica Spectrum Disorder (NMOSD)

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Introduction: A concern over the COVID-19 pandemic's potential to increase the incidence rate and relapse of MS and NMOSD has arisen due to the vaccination against the virus and its emergence. Confirmation of this relationship is still lacking.

Objective: The primary objective of the study was to compare the incidence rates of relapse in patients with MS and NMOSD between the pre-pandemic and pandemic eras. The second objective included finding incidence of newly diagnosed cases and analyzing the relationship between COVID-19 infection/vaccination and relapse.

Material and Method: We separated the time periods into two categories: pre-pandemic (1 January 2017 to 31 December 2019) and during-pandemic (1 January 2020 to 31 December 2022). The interesting outcome was relapse events compared between both periods. Multivariate time-to-events techniques were used to assess the relapse between both time periods, including Anderson-Grill (AG), Prentice Williams and Peterson (PWP), both total time (TT) and gap time (GT), and the Cox-frailty model.

Results: A total of 697 data contributors from 405 MS and NMOSD patients were evaluated and categorized into two groups: pre-pandemic (328 data) and during-pandemic (369 data). A total of 1720.21 person-years were recorded, with 794.38 person-years prior to the pandemic and 925.83 person-years during the pandemic. The outcome shows that incidence rates of relapse did not significantly differ between the pre-pandemic and pandemic periods (p -value = 0.96). The rate of relapse did not change significantly between the two time periods after being adjusted for rituximab use and disease duration as shown by different statistical models for multiple events (AG model), event-specific inter-individual analyses (PWP-TT, PWP-GT), and intra-individual analyses (Cox-frailty models).

Conclusion: There is insufficient evidence to establish a link between COVID-19 infection or vaccination and a higher frequency of relapses in MS and NMOSD.

Bell's Palsy Treatment with a Combination of Vitamin B12 and Prednisolone Compared with Prednisolone Alone; Double-Blind, Randomized Controlled Trial

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Introduction: Many experts recommended to initiate prednisolone for treatment of Bell's palsy within 3 days of symptoms. However, there was a previous study showed, that a combination of intramuscular vitamin B12 and prednisolone has higher efficacy compared to prednisolone alone. Because of the difficulty of the intramuscular route of administration and at present, there was no previous study of the efficacy of oral route vitamin B12, so we conducted this study to explore the efficacy of the oral form of vitamin B12 in Bell's palsy.

Objective: to compare the clinical improvement of Bell's palsy treatment between the mecobalamin-prednisolone group and placebo-prednisolone group by using a clinical grading scale.

Materials and Methods: A double-blind randomized controlled trial study was conducted in 27 adults with Bell's palsy aged over 18 years, newly diagnosed between May and November 2023. These patients were divided into two groups: the study group received mecobalamin-prednisone treatment consisting of 13 patients, while the control group received placebo-prednisone treatment with 14 patients. To assess the effectiveness of the treatments, we conducted clinical comparisons using House-Brackmann and SunnyBrook grading scales. Both groups showed no different of final treatment outcome at 12 weeks

Results: The results revealed that the mecobalamin-prednisolone treatment showed superior outcomes compared to the placebo-prednisolone treatment, significant improvement in SunnyBrook grading scale at 4 weeks and 6 weeks after treatment ($p = 0.041, 0.017$ respectively) without significant side effects compared to placebo.

Conclusion: Additional oral vitamin B12 to prednisolone can increase rate of recovery in Bell's palsy patients without significant side effect.

Association of Red Blood Cell Distribution Width (RDW), Neutrophil to Lymphocyte Ratio (NLR) and Incidence of Recurrent Ischemic Event in Transient Ischemic Attack (TIA) Patients

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Introduction: Transient Ischemic Attack (TIA) stands as a significant predisposing factor for ischemic stroke. Presently, the ABCD2 score serves as the established method for risk assessment. Regrettably, the ABCD2 score demonstrates only moderate sensitivity and specificity. This study endeavors to identify an alternative prognostic indicator for this clinical scenario. Red Cell Distribution Width (RDW) and Neutrophil-to-Lymphocyte Ratio (NLR) emerge as potential candidates, having been recognized as poor prognostic markers in diverse medical conditions, including stroke, owing to their reflective values of neuroinflammatory processes.

Objective: This study aimed to find correlation between RDW, NLR and risk of recurrent ischemic event in TIA population.

Material and Methods: Patients hospitalized with a TIA diagnosis within 24 hours from January 2015 to December 2022 were retrospectively analyzed for demographic and laboratory data. Recurrent ischemic events within 7 and 90 days were assessed, comparing RDW and NLR. Model discrimination was evaluated by the area under the receiver operating characteristic curve for each marker.

Results: A total number of 283 patients were enrolled in the study. RDW in patients with recurrent ischemic events within 7 days was at 13.35 (IQR 1.85) which was not different significantly from another group (13.7, IQR 1.50). NLR was at 2.03 (IQR 1.31) and 2.24 (IQR 1.41) ($p = 0.619$) for TIA patients with and without recurrent events in 7 days, respectively. For 90 days follow-up period, TIA patients with recurrent ischemic events in 90 days had lower RDW at 13.55 ± 1.58 compared to another group at 13.7 ± 1.43 which did not have a significant difference ($p = 0.261$). NLR in TIA with recurrent ischemic events in 90 days also did not show different values from another group ($p = 0.861$). The area receiver operating characteristics obtained from RDW or NLR did not demonstrate correlation with recurrent ischemic stroke in TIA patients both 7 and 90 days.

Conclusions: RDW and NLR were not associated with occurrence of recurrent ischemic events in 7 days and 90 days after diagnosis of TIA.

Outcome of Second Immunomodulatory Treatment in Guillain-Barré Syndrome Patients with Poor Response to Initial Treatment in Neurological Institute of Thailand: A Single-Center Retrospective Observational Study

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Introduction: Guillain-Barré syndrome (GBS) is an immune-mediated polyneuropathy. The majority of patients have a good response to standard treatments which are intravenous immunoglobulin (IVIG) and plasma exchange (PE). However, some patients have poor responses, which do not improve and may deteriorate. Therefore, the second immunomodulatory treatment is considered for these patients.

Objectives: This research aimed to study the outcome of a second immunomodulatory treatment in GBS patients with poor response to initial treatment at the Neurological Institute of Thailand.

Materials and Methods: An observational retrospective review was performed, including patients with GBS between January 2017 and June 2023. Demographic data, clinical features, CSF profiles, electrodiagnostic classifications, MRC sum scores, and GBS disability scores at admission, 4 weeks, 8 weeks, 12 weeks, and 24 weeks were analyzed.

Results: A total of 64 patients with GBS were included. 17 patients (26.6%) had a poor response to the initial treatment. 7 patients (41.2%) received the second treatment. There were 6 patients (85.7%) who had PE followed by IVIG and 1 patient (14.3%) had a second dose of IVIG. The results showed no significant difference in the MRC sum score and GBS disability score during follow-up between the two groups. The patients in the second treatment group had higher serious complications including 1 patient (14.3%) had a catheter-related bloodstream infection and 1 patient (14.3%) had a thromboembolic event.

Conclusion: The second immunomodulatory treatment in GBS patients with poor response to the initial treatment is not associated with an improvement in MRC sum scores and GBS disability scores, intubation periods, length of hospital stay, and mortality. There are increased risks of treatment-related complications, including catheter-related bloodstream infections, and thromboembolic events.

Hyperdensity Sign on Immediate Non-Contrast CT after Endovascular Treatment in Acute Large Vessel Occlusion Patients Predict Intracerebral Hemorrhage, Neurological Institute of Thailand

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Introduction: Hyperdensity lesions with a maximum Hounsfield unit measurement ($HU \geq 90$) are associated with symptomatic ICH, while lesions with $HU < 90$ indicate contrast leakage.

Objective: The study's aim is to assess $HU \geq 90$ hyperdensity lesions after mechanical thrombectomy (MT) to predict intracerebral hemorrhages (ICH) within 24 hours, with the goal of improving patient outcomes and reducing disability and mortality in acute ischemic stroke cases with large vessel occlusion.

Material and Method: Patients with acute intracerebral large vessel occlusion who underwent MT between June 2017 and June 2022 were retrospectively and prospectively reviewed. NCCT brain scans were performed immediately after MT and within 24 hours after MT. These NCCT brain images were classified into two groups: $HU \geq 90$ and $HU < 90$ hyperdensity lesion groups. The ICH outcomes were measured, and the sensitivity, specificity, and positive and negative predictive values of the metallic hyperdensity sign in predicting parenchymal hemorrhage were calculated.

Result: 135 patients were included, with an average age of 63.81 ± 13.69 years (51.1% female). Among these patients, 87 had intracerebral hemorrhage (ICH), with 69 patients (85.2%) having $HU \geq 90$ and 18 patients (33.3%) having $HU < 90$ ($p < 0.001$). The study found that $HU \geq 90$ in predicting ICH had a sensitivity of 79.07%, a specificity of 73.47%, a positive predictive value of 83.95%, a negative predictive value of 66.67%, and an odds ratio of 11.5.

Conclusions: The presence of hyperdensity lesion ($HU \geq 90$) on NCCT brain imaging immediately after MT in anterior circulation large vessel occlusion may indicate a high risk of ICH within 24 hours.

Prevalence and Risk Factors of Low Vitamin D Level in Thai Adults with Epilepsy

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Introduction: Epilepsy has a wide-ranging impact on the patient's quality of life. Certain factors affect the body metabolism and absorption of nutrients and minerals, including vitamin D. The low level of vitamin D contributing to various bone diseases as well as potentially affecting seizure control. However, risk factors for low vitamin D levels in epilepsy are inconclusive. Limited studies in Thailand may not be sufficient to provide recommendations for screening vitamin D in epilepsy patients.

Objective: To evaluate the prevalence and risk factors for low vitamin D levels in Thai adults with epilepsy. To provide supporting recommendations for screening vitamin D levels in epilepsy patients for early diagnosis and appropriate management.

Materials and Methods: A cross-sectional study was conducted in 87 adults with epilepsy aged 18-76 years, followed up at the Neurological Institute of Thailand between March and October 2023. Baseline demographic data, epilepsy-related information, and anti-seizure medications information was analyzed. Blood tests for vitamin D [25(OH)D], calcium, phosphorus, and albumin were measured.

Results: The prevalence of low vitamin D levels was 85%, being deficiency 37% and insufficiency 48%. Mean serum 25(OH)D was 21.9 ± 7.60 ng/ml. Female gender was significantly associated with low vitamin D levels. No significant association between epilepsy-related information, and antiseizure medications with low vitamin D levels.

Conclusion: The prevalence of low vitamin D levels is significantly higher compared to previous studies, and consistent with recent studies in many countries. We strongly recommend screening vitamin D levels in Thai adults with epilepsy, particularly in females. Early diagnosis and management of this condition are beneficial and can help mitigate various complications resulting from low vitamin D.

Comparative Efficacy and Safety of Combined Intravenous Alteplase and Endovascular Treatment Versus Direct Endovascular Treatment in Acute Basilar Artery Occlusion at Neurological Institute of Thailand

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Objective: This study aimed to compare the functional outcomes between endovascular treatment (EVT) with and without intravenous thrombolysis (IVT) first in patients who had acute basilar artery occlusion (BAO).

Introduction: Acute occlusion of the basilar artery is potentially life-threatening. Currently, there are inconclusive and conflicting conclusions regarding the comparison between EVT and standard medical treatment in BAO patients.

Materials and Methods: BAO patients who underwent EVT within 24 hours of onset were enrolled in Neurological Institute of Thailand between July 1, 2015 to August 31, 2023, and the efficacy and safety were compared between IVT+EVT and direct EVT (DEVT). The primary outcome was 90-day functional independence. All outcomes were assessed with adjusted OR (aOR) from the multivariable logistic regression.

Results: Of 93 enrolled patients with BAO, 53 (57%) were treated with DEVT and 40 (43%) with IVT+EVT. Successful mTICI_{2b} post-EVT higher in patients treated with IVT+EVT (82.5% vs 62.3%, $p < 0.05$) (aOR, 3.12; 95% CI, 1.01-9.62; $p = 0.047$). IVT+EVT was associated with a good functional outcome of mRS 0-2 at 90 days (aOR, 1.58; 95% CI, 0.59-4.26; $p = 0.365$) but higher mortality at 90 days (aOR, 1.34; 95% CI, 0.31-5.84; $p = 0.700$) without statistical significance.

Conclusion: This study demonstrated that, compared with DEVT, EVT with IVT first was associated with similar functional outcomes at 3 months in patients with BAO. The successful reperfusion rate (mTICI_{2b-3}) in EVT with IVT first was significantly higher than DEVT and showed a tendency towards more improved functional outcomes at 3 months in EVT with IVT first.

Prevalence of Post-stroke Cognitive Impairment and Association between Stroke Infarct Location and Domain-Specific Cognitive Impairment

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Background: Post-stroke cognitive impairment (PSCI) affected stroke survivors. There were many diversities in correlation of PSCI with stroke characteristics and infarct locations. We identify prevalence of PSCI and association between infarct location by brain imaging and domain of cognitive impairments.

Methods: A pilot prospective cohort study was conducted at Neurological Institute of Thailand (NIT) during April to September of 2023. Cognitive assessment was assigned 3 times (within 14 days after stroke onset, 1 month after stroke onset, and 3 months after stroke onset) in acute ischemic stroke patients by Thai Mental State Examination test (TMSE) and Montreal Cognitive Assessment (MoCA) – Thai version. PSCI referred to cognitive impairment at 3 months after stroke onset. Stroke infarct locations were collected from brain imaging and mapped into 21 locations, which covered supratentorial and infratentorial area. Then we re-categorized by 3 categories for subgroup analysis: by vascular cognitive impairment (VCI) subtype, arterial supply, and brain compartment. Alberta Stroke Program Early CT score (ASPECTS) and posterior circulation ASPECTS (pc-ASPECTS) had also been evaluated as predictor of PSCI.

Results: The prevalence of PSCI was 48.39%. Hemorrhagic transformation was one of the risk factors of PSCI (OR 12.985, 95%CI 1.251-134.723, p-value 0.032). In cognitive domain subgroup analysis, there was a trend in different of severity in domain-specific deficits. But they were not statistical significance. The appropriate cut-off point to screen PSCI for ASPECTS was 8, and pc-ASPECTS was 9.

Conclusion: We should raise concern about post-stroke cognitive screening in all stroke patients, especially in patients with hemorrhagic transformation. ASPECTS and pc-ASPECTS were tools for PSCI prediction.

Efficacy and Safety of Direct Oral Anticoagulants (DOACs) Compared to Warfarin in Ischemic Stroke Prevention among Elderly Patients with Nonvalvular Atrial Fibrillation in Neurological Institute of Thailand

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Introduction: Elderly patients with AF-related stroke tend to have severe neurological deficits and high mortality. However, previous studies provide insufficient data on anticoagulation strategies for these patients.

Objectives: To assess the efficacy and safety of DOACs compared to warfarin in ischemic stroke prevention among elderly patients with nonvalvular AF in the Neurological Institute of Thailand.

Materials and Methods: This retrospective cohort study analyzed patients aged ≥ 65 years with AF who received warfarin or DOACs (dabigatran, rivaroxaban, apixaban, or edoxaban) from January 2018 to July 2023 in the Neurological Institute of Thailand. The primary outcome was ischemic stroke. Hazard ratios (HRs [95% CIs]) were calculated for all outcomes.

Results: A total of 280 patients were recruited, of whom 200 were in the DOACs group (four subgroups of 50 patients each prescribed dabigatran, rivaroxaban, apixaban, and edoxaban), and 80 in the warfarin group. To compare the DOACs group with the warfarin group, we found significant differences in that the DOACs group was older age (mean age 74.7 vs 71.93, $P=0.001$), covered under State Enterprise Officer (75%, $P<0.001$) for medical benefit schemes, and a higher CHA₂DS₂-VASc score (5.17 vs 4.70, $P=0.001$). However, there was no significant difference in ischemic stroke, major bleeding, intracranial hemorrhage, gastrointestinal bleeding, and acute kidney injury between the two groups.

Conclusion: In this study, the elderly patients with AF who received DOACs or warfarin are both efficacious and safe.