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Polysomnographic Characteristics in Patients with Epilepsy: A Multicenter Study

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Abstract

Introduction: Co-morbid sleep problems in turn, lead to a poorer quality of life in adults. The association between epilepsy and sleep architecture alterations has been demonstrated especially in the context of refractory or difficult to treat epilepsy. However, studies include heterogeneous populations and methodological variations often precluding comparison. Treatment of sleep disorders in patients with epilepsy is likely to improve quality of life along with improved seizure control.

Objectives: The aim of the study is to analyze the sleep characteristics using polysomnography (PSG) and sleep questionnaires in patients with epilepsy.

Materials and Methods: 169 patients with epilepsy were recruited from secondary medical care, tertiary medical care and university hospital. Daytime sleepiness were evaluated with Epworth sleepiness scale (ESS). Risk of obstructive sleep apnea was evaluated with sleep apnea scale of the sleep disorders questionnaire (SA-SDQ) and STOP BANG questionnaire. PSG was done to assess the sleep architecture.

Results: Among 166 patients with epilepsy, 41 with refractory epilepsy with a median age of 33.5 years (IQR, 25-42), median body mass index (BMI) of 23.82 kg/m2 (IQR, 21.45-26.20). Forty-six (27.2%) patients with epilepsy had daytime sleepiness by ESS. PSG showed median sleep efficacy 91% (IQR, 86.4-95.0). 20(12.0 %) patients were found to have OSA. There were no significant differences in other sleep architectures between patients who had refractory and controlled epilepsy.

Conclusion: PSG revealed no statistical significant difference in sleep architecture between medically refractory and controlled epilepsy.

Predictors of Clinical Outcome among Thai Patients with Atrial Fibrillation-Associated Acute Ischemic Stroke

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Abstract

Introduction: Atrial fibrillation (AF) is the most common cardiac arrhythmia worldwide and the estimated global age-adjusted prevalence was 0.5% in 2010. Currently, data regarding other independent poor prognostic factors among the subgroup acute ischemic stroke patients suffering AF are quite limited. Therefore, this study aimed to identify the independent factors predicting mortality in patients with AF-associated acute ischemic stroke (AF-stroke).

Objectives: To investigate the predictors of 3-month death among an atrial fibrillation-associated acute ischemic stroke (AF-stroke).

Materials and Methods: This retrospective cohort study was conducted at a university hospital in Thailand. Patients with AF-stroke admitted between 2012 and 2017 were enrolled into the study. Baseline characteristics, clinical presentations, complications, and outcomes measured by the modified Rankin scale were collected from electronic medical records. Predictors of death outcomes were analyzed by univariate and multivariate logistic regression analysis.

Results: The mortality rate among 119 AF-stroke patients was 26.89%. The independent predictors of 3-month death were developing AKI during hospitalization (adjusted odds ratio [aOR] = 6.38, 95% CI = 1.96-20.76, p = 0.001) and age above 75 years old (aOR = 3.08, 95% CI = 1.17-8.13, p = 0.019). In contrast, receiving treatment with an oral anticoagulant prior to the stroke episode was a protective factor (aOR = 0.13, 95% CI = 0.03-0.64, p = 0.002).

Conclusion: Developing AKI and older age were the independent predictor of 3- month death among AF-stroke patients.

Prevalence of Acute Cardioembolic Stroke in Stroke Unit in Rajavithi Hospital

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Abstract

Objective: Acute cardioembolic stroke causes the most severe disease and the most recurring , which can be found in approximately 20-30% of ischemic stroke patients. There are treatment and prevention of recurrence by using anticoagulant drugs differs from treatment and prevention of recurrence for other causes. Correct diagnosis and appropriate treatment are what patients should receive.

Materials and Methods: Data from the medical record collected from 297 acute ischemic stroke patients admitted to the stroke unit in Rajavithi Hospital from 1 July 2019 to 30 June 2020 and analyzed using descriptive statistics.

Results: Of the total number of 297 patients, 9.1% were diagnosed with acute cardioembolic stroke. The severity of acute ischemic stroke was measured by NIHSS, the median was 4 (1-24), and the outcome was measured by mRS score at admission, the median was 3 (1-5) and mRS before discharge, the median was 1 (1-6). There was one predictive factor for cardioembolic stroke: age (Adjust odds ratio of 1.04; 95% CI, 1.01-1.08). Of the total subjects, 23.2% had clinical suspicion for a definite cardioembolism that was performed echocardiogram 82.6%, holter monitoring 52.1% and both 49.3%.

Conclusions: The prevalence of acute cardioembolic strokes accounted for 9.1% of all acute ischemic strokes, which was less than previous study.

Keywords: Cardioembolic stroke, Echocardiogram, Holter monitoring

Related Factors of Recurrent Stroke among Stroke Patients in Rajavithi Hospital

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Abstract

Background: Patients who have first attack of stroke, trend to have recurrent stroke more than normal people, which can decrease quality of life and increase morbidity and mortality. Current data in Rajavithi hospital about prevalence and related factors of recurrent stroke is few.

Objective: To describe the prevalence and related factors of recurrent stroke

Methods: This epidemiologic research was conducted base on a retrospective study of 914 ischemic stroke patientsfrom January 1st, 2015 to December 31st, 2019 presented in Rajavithi Internal Medicine unit. Demographic data of age, sex, BMI, hypertension, diabetes mellitus, dyslipidemia,obesity, old cerebrovascular disease, atrial fibrillation, smoking , alcohol drinking , and history of routine exercises were collected manually. The data was analyzed by the stepwise regression method to find the most significant valuable to recurrent stroke.

Results: Prevalence of recurrent stroke, a stroke patient with at least one stroke event recorded. The prevalence of recurrent stroke is 16.7%. The mean age of stroke patients was 66 +/- 13.17 years old. There were 356 men (38.95%) and 558 women (68.05%) with 61 smokers (6.7%) By the demographic data, patients with history of old cerebrovascular disease (old CVA) are 153 (16.74%) and dyslipidemia are 354 (38.8%) patients. The patient with history of old CVA and dyslipidemia who also smoke has a significant p-valued of 0.01 to recurrent stroke related factors. With the R square of 67.7% from old CVA and R square change of 0.3% and 0.2% of smoking and dyslipidemia respectively. However, hypertension, diabetes mellitus, obesity, atrial fibrillation were associated, but were not significant.

Conclusion: Old CVA, dyslipidemia and smoking are the major related factors of recurrent stroke in Rajavithi hospital. However old cerebrovascular disease has the most impact on recurrent stroke. Therefore physicians should be aware of secondary prevention for decreasing morbidity and mortality.

Incidence of Pneumonia and Associated Factors in Ischemic Stroke Patient Admitted in Rajavithi Stroke unit

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Abstract

Background: Ischemic stroke is the first cause of death in women and the third in men, in Thailand. Treatments depend on the time of the onset and available penumbra imaging assessment, to best preserve the brain functions. And besides weakness, disability in stroke patients, dysphagia is also common. Dysphagia is a factor to develop pneumonia as well. Both disease complications and other infections during admission can prolong the length of stay.

Objective: To find the incidence and associated factors of pneumonia in ischemic stroke patients in Rajavithi stroke unit.

Methods: This epidemiological study was conducted based on a retrospective cohort of ischemic stroke patients, admitted to Rajavithi stroke unit from September 1st, 2019 to August 31st, 2020. Ischemic stroke severity was given with NIHSS (National Institutes of Health Stroke Scale) by the first neurologist who exposed the patient. Pneumonia was diagnosed by the Modified CDC criteria.

Results: From 149 patients, there are 19 (12.8%) patients with dysphagia, and 8 patients (5.4%) with pneumonia during the admission. From the demographic data, 60 patients have diabetes mellitus as a comorbid. We found the relationship between dysphagia and diabetes mellitus with pneumonia, with the statistically significant p- value at 0.022 and 0.018 respectively.

Conclusion: The associated factor with pneumonia is diabetes mellitus. The disease-related factor is dysphagia without clinical severity related. Dysphagia and diabetes mellitus should be evaluated and properly managed for pneumonia prevention or decrease severity. This study does not provide enough data on clinically related factors to find more relationships with pneumonia.

The Prevalence of Skin Sensitization of Rivastigmine Transdermal Patch in Patients with Dementia at Thammasat University Hospital: Preliminary Analysis Focusing on Efficacy and Study Drug Usage

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Abstract

Background: As well as any other acetylcholine esterase inhibitor drugs, rivastigmine per oral induces nausea. Deliver rivastigmine via a transdermal patch is a novel method to avoid the adverse gastrointestinal effect. However, its efficacy, adverse events, skin reaction, and feasibility in the Thai population are lacking.

Objective: We aim to evaluate the efficacy, skin reaction, and safety of the rivastigmine transdermal patch.

Method: We enrolled patients with mild to moderate dementia of Alzheimer type, mixed with the vascular cognitive disorder or Parkinson's disease with dementia, into the study. Efficacy (improvement of TMSE and MoCA score), skin reaction, other adverse events, discontinuation, and compliance were analyzed.

Results: 45 patients (60%female) were enrolled. The mean age was 76 years. Mean TMSE and MoCA scores at baseline were 17 (range 11-23) and 14.9 (range 10-21). The mean of TMSE and MoCA scores were both improving at 12-week, but no significant difference in mean score change (p-value 0.729 vs. 0.603). The main adverse drug event was skin irritation at 33.3% (15.6% significant skin reaction, which leads to discontinuing rivastigmine patch). There was no report of nausea and vomiting. Drug compliance is satisfied.

Conclusion: Transdermal delivery of rivastigmine may improve efficacy and compliance by diminishing usual adverse events such as nausea and vomiting; however, there is a high rate of application site skin reaction of as much as 33 %. These skin reactions may lead to patients' drug discontinuation.

Keywords: Dementia, Thai Mini State Examination, Montreal Cognitive Assessment, Rivastigmine transdermal patch, Cutaneous application site reaction, Skin irritation

Efficacy of Yahom-Navakot Remedy Plus Levofloxacin for Preventing Nosocomial Infection in Post-Cardiac Arrest Patients Treated by Targeted Temperature Management

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Abstract

Background: Targeted Temperature Management (TTM) is a standard treatment for post-cardiac arrest syndrome (PCAS) despite reported various complications, including nosocomial infections. The infectious prophylaxis should be concerned.

Objective: To study the efficacy and safety of levofloxacin plus Yahom-Navakot remedy compared with levofloxacin monotherapy and placebo for nosocomial infection prevention in PCAS patients treated by TTM.

Methods: The participants were included from April 1 to September 31, 2020, and were randomly assigned into three groups, levofloxacin combined with Yahom Navakot remedy, levofloxacin alone, and placebo, as 1: 1: 1 ratio. The primary outcome was the all-cause mortality. The secondary outcome included infection parameters and safety outcome on the third and seventh days.

Discussion: According to pandemic era of COVID-19, case recruitment was limited. There were only 9 included patients regardless of targeted 132 cases. It was estimated to take 7.3 years to enroll all participants in single-base trial; therefore, extending the study to multi-center bases should be contemplated. Nonetheless, the consideration of the protocol amendment by omitting levofloxacin monotherapy and comparing the combination of levofloxacin and Yahom-Navakot remedy versus placebo may decrease targeted sample size and can be statistically analyzed.

Keywords: Targeted Temperature Management, Post-cardiac arrest syndrome, Nosocomial infection, Prophylactic antibiotics

A Retrospective Review of Real-Life Practice of Intravenous Immunoglobulin Usage in Autoimmune Neurological Disease

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Abstract

Introduction: Intravenous immunoglobulin (IVIg) is widely used in treatment of immune-mediated neurological diseases. However, it is still off label in some diseases due to lack of large clinical trial evidence.

Objective: To review the prescription of IVIg in neurological disease regarding the efficacy, prescription pattern, indication and treatment outcome.

Material and Method: We reviewed the prescription database and medical records from 2013 to 2019 at Thammasat University Hospital (TUH) which is the university hospital in lower central region of Thailand and Bangkok Hospital Medical Center (BMC) which is the largest private hospital network in Bangkok, Thailand regarding IVIg usage and treatment outcome.

Results: IVIg was used in 28 patients in TUH and 86 patients in BMC. The diagnosis were Guillain Barre syndrome (GBS) (50%), myasthenia gravis (MG) crisis (23%) and chronic inflammatory demyelinating polyneuropathy (CIDP) (6%). 39.5% of patients were prescribed IVIg apart from NLEM indication. The major cause of NLEM deviation is off label use, but the dose of IVIg is within standard guideline. IVIg usage and treatment outcomes were similar between two hospitals in GBS and MG. BMC often used IVIg as first line treatment of CIDP, but TUH used IVIg as subsequent therapy after failure of corticosteroid. TUH preferred plasmapheresis combined with high dose steroid for NMOSD and autoimmune encephalitis due to the cost of therapy and reimbursement guideline.

Conclusion: IVIg is still the mainstay treatment of GBS and MG crisis in Thailand. The outcome of GBS and MG crisis is similar in two hospitals. Private hospital seemed to have more off label use and often used IVIg as a first line therapy in CIDP, NMOSD and autoimmune encephalitis. Reimbursement guideline and NLEM have a major impact in prescription pattern.

Keywords: IVIg, Thailand, NLEM, Efficacy, Indication

Implications of A Presence of Hyperdense Middle Cerebral Artery Sign to Determine the Subtypes of Stroke Etiology

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Abstract

Objectives: To study the association of hyperdense middle cerebral artery sign (HMCAS) in non-contrast computed tomography (NCCT) brain and subtypes of stroke etiology.

Materials and Methods: This is a retrospective-hypothesis testing study. The patients aged 18 or more who had middle cerebral artery occlusion symptoms with HMCAS from brain NCCT and received intravenous thrombolysis between January 2016 and June 2019 were enrolled. The demographic data, clinical outcomes, stroke subtypes, and characteristics of HMCAS were collected from medical records.

Results: Ninety-nine patients were presenting with HMCAS from 299 patients. The most common subtype is cardioembolism. Among the baseline characteristics, hypertension is more common in large-artery atherosclerosis (LAA) (86.4%), and atrial fibrillation (AF) is the highest in cardioembolism (44.8%). HMCAS disappearance in cardioembolism is lowest compared with LAA and others (63% vs. 91% vs. 94.7%, respectively). The univariable analysis found that HMCAS disappearance is significantly associated with all stroke subtypes (Odds ratio, 95% confidence interval 10.58, 1.31-85.43; *P*=0.027 for others 5.88, 1.24-27.85; *P*=0.026 for LAA). Multinomial logistic regression found that body weight and hypertension were associated with the LAA subtype. AF and intracranial hemorrhage (ICH) were associated with cardioembolism.

Conclusions: The presence of HMCAS prefer cardioembolism but cannot indicate the definite stroke etiologic subtype. The risk factors, including body weight, hypertension, and AF, will help predict stroke subtypes more than HMCAS.

Management and Outcomes of Recombinant Tissue Plasminogen Activator Associated Bleeding in Acute Ischemic Stroke

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Abstract

Background: Intracranial hemorrhage (ICH) is the most devastating complication of recombinant tissue plasminogen activator (rt-PA) treatment in acute ischemic stroke patients. Data on management and outcomes rt-PA associated ICH are limited.

Objectives: To determine the incidence, risk factors, characteristics, management and clinical outcome of rt-PA associated ICH.

Methods: We conducted an analysis of the data derived from the Maharaj Nakorn Chiang Mai Hospital Stroke registry between 1995 and 2019. We included consecutive ischemic stroke patients who were 18 or older and received rt-PA. Study outcomes were incidence and characteristic of ICH, ICH management, 90-day National Institute of Health Stroke Scale (NIHSS), Barthel index and all-cause mortality.

Results: Of 725 rt-PA treated patient, 50 (6.9%, 95% confidence interval (CI) 5.2-9.0) had symptomatic ICH (sICH) and 166 (16.0%, 95% CI 13.4-18.9) had asymptomatic ICH (aICH). Cardioembolic stroke subtype, prior antiplatelet use, NIHSS >15, and Barthel index <25 at stroke diagnosis were independent risk factors of ICH. Patients with sICH had more parenchymal hemorrhage (98.0% vs. 18.1%, *P*<0.001) comparing to aICH. Fresh Frozen Plasma and cryoprecipitate were the most common blood product used to reverse anticoagulant effect. Craniotomy was performed in 60% and 1% of patients who had sICH and aICH. At 90 days, patients who had sICH had poorer clinical outcomes (NIHSS, Barthel index and death) as compared to aICH and those without ICH. Compared to non-ICH patients, sICH and aICH were associated with increased risk of 90-day mortality, Hazard ratio (HR), 95% CI was 40.6, 19.5-84.5 and 4.5, 1.9-10.3, respectively.

Conclusions: rt-PA associated ICH increased risk of morbidity and mortality outcomes, regardless of symptom. Further clinical trials focusing on treatment of rt-PA associated ICH is urgently needed.

Keywords: Cerebrovascular disease, Stroke, Symptomatic intracerebral hemorrhage, Thrombolysis, Fresh frozen plasma, Acute ischemic stroke, Recombinant tissue plasminogen activator, rt-PA

Prevalence and Incidence of Cerebrovascular and Cardiovascular Disease in Obstructive Sleep Apnea Patients Who were Diagnosed by Standard Full Night Polysomnography Type I in Thai Population, Retrospective 10 Years Study

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Abstract

Objective: This study aims to determine prevalence, incidence and relevance of obstructive sleep apnea (OSA) with cerebrovascular disease, cardiovascular disease and hypertension.

Materials and Methods: We conducted retrospective cohort study among patients, age above 18-year-old, who had undergone standard full night polysomnography type I with apnea hypopnea index (AHI) ≥5 at the sleep laboratory unit of the Northern Neuroscience Center, Faculty of Medicine, Chiang Mai University during 2007-2016. The outcomes were prevalence and incidence of cerebrovascular disease, cardiovascular disease and hypertension.

Results: 704 enrolled participants were divided into non-severe OSA (AHI 5-<30, N=82) and severe OSA (AHI ≥30, N=622). Prevalence of cerebrovascular disease, cardiovascular disease and hypertension was 8.66%, 12.64% and 55.82% respectively. Prevalence of cardiovascular disease was significantly higher in severe OSA (4.88% VS 13.67%, P-value 0.021). Severe OSA trended to associate with higher incidence rate of cerebrovascular disease (0.86 per 100 person-years, 95%CI [0.60-1.24]), cardiovascular disease (3.58 per 100 person-years, 95%CI [2.98-4.30]) and hypertension (2.46 per 100 person-years, 95%CI [1.90-3.06]). Incidence of ischemic stroke was significantly high in severe OSA (P-value 0.026). Severe OSA trended to be risk for cerebrovascular disease, cardiovascular disease and hypertension (hazard ratio 5.30, 95%CI [0.72-39.25], 1.87, 95%CI [0.97-3.57] and 1.64, 95%CI [0.79-3.40] respectively).

Conclusion: Severe OSA had high prevalence of cerebrovascular disease and trended to increase incidence and risk of cerebrovascular disease, cardiovascular disease and hypertension with significantly increased incidence for ischemic stroke. Further study in non-OSA, treated and nontreated OSA may be useful to determine statistical difference of outcomes.

Keywords: Obstructive sleep apnea, Cerebrovascular disease, Cardiovascular disease, Hypertension, Prevalence, Incidence

Long Term Exposure of $PM_{2.5}$ Components Air Pollution and Risk of Ischemic Stroke Admission in Thailand

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Abstract

Introduction: Exposure to $PM_{2.5}$ in ambient air have been long known to associated with risk of ischemic stroke, but there have yet to be the study that demonstrated the contribution of each $PM_{2.5}$ contribution to risk of ischemic stroke and spatial effect on ischemic stroke incidence.

Objectives: We aimed to study spatial effect of each PM subspecies and contribution of each PM subspecies to incidence of ischemic stroke.

Materials and Methods: Using the satellite-based pollutant data from MERRA-2 satellite and incidence of ischemic stroke data from Thailand universal health coverage system from 2014 - 2016, we demonstrated spatial relationship of each PM subspecies using Poisson log-linear model and linear predictor of ischemic stroke incidence rate ratio by pollutant subspecies by INLA approach.

Results: District 6 demonstrated highest incidence rate ratio in all PM subspecies, which were 2.25, 2.41, 2.55 and 1.66 times greater than districts with lowest concentration for black carbon, sulphate, organic carbon, and dust, respectively. The multivariate analysis using INLA approach showed that an increase of 1 mcg/m^3 in black carbon and dust was associated with an increase of 23% and 7% in the risk of ischemic stroke, respectively.

Conclusion: With our results, this process can determine that black carbon was significantly associated with risk of ischemic stroke.

Acute Effect of Air Pollution on Ischemic Stroke and Hemorrhagic Stroke Admission: Time-Stratified Case-Crossover Study in Khon Kaen, Thailand

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Abstract

Introduction: Cerebrovascular accidents (stroke) are the third leading cause of death worldwide and first leading cause of death in Southeast Asia. In Thailand, stroke is the third leading cause of death next after ischemic heart disease and road injuries, also in Khon Kaen. Previous study found that the short-term exposure to PM_{10}, sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) was significantly associated with increased ischemic stroke risk. Nevertheless, there still lacked knowledge on certain relationships investigated on stroke in Thailand.

Objective: To investigate the association of acute effect between gaseous pollutants, particulate matter and stroke admission in Khon Kaen, Thailand.

Materials and Methods: This study was applied the time-stratified case-crossover(ts-CCO) study design to estimate the association of short-term lag periods exposure of gaseous pollutants and air pollutions on number of hospital admissions for acute stroke in both ischemic and hemorrhagic events. Data from Thailand's National Health Security Office (NHSO) and Khon Kaen Meteorological Center between 1st January 2015 and 31st December 2016.

Result: This study was found positive and significant association between short-term exposure to all ambient and gaseous air pollutants; $PM_{2.5}$, PM_{10}, CO, NO_2, SO_2, O_3 and acute hemorrhagic stroke in age under 45 years in Khon Kaen, Thailand. Which no evidence of an association between ambient and gaseous air pollutants and the relative risk of acute ischemic stroke in any age group.

Conclusion: Our study suggested that the short-term exposure to CO, NO_2, SO_2, O_3, $PM_{2.5}$, PM_{10} was significantly associated with increased acute hemorrhagic stroke risk in young adult under 45 years. These findings may have significant public health implications for the prevention of acute hemorrhagic stroke. Further studies on this topic are warranted to validate our research.

Etiology and Outcomes of Status Epilepticus in Adults: A Population-Based Study on Causes and Outcomes

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Abstract

Background: Status epilepticus (SE) is a common neurological emergency that associated with a high rate of morbidity and mortality. SE was defined traditionally as 30 minutes of ongoing epileptic activity or seizures without recovery in-between. In 2015, a Task Force of the International League Against Epilepsy (ILAE) proposed to define SE as bilateral tonic-clonic activity lasting longer than 5 minutes, and absence SE and focal SE as exceeding 10 minutes. The new ILAE classification of SE 2015 distinguishes nonconvulsive SE (NCSE) from SE with prominent motor phenomena. This allows epidemiologic investigation of NCSE and its different subtypes in population-based studies. As a consequence of the shorter diagnostic time with the new definition, we expected to identify more patients with SE, and aimed to assess the impact on outcome of the evolution of the clinical presentation of SE.

Objective: In 2015, the International League Against Epilepsy (ILAE) proposed a new definition of status epilepticus (SE). We aimed to apply the new definition of SE and analyze seizure types, clinical presentation, causes, complications, and predictors of the poor outcome based on the new definition.

Method: We conducted a retrospective chart review of all adult patients with SE in Vajira hospital between January 2016 and January 2019. SE was defined and classified according to the ILAE 2015.

Results: Out of participants, 86 (57.3 %) were men with a median age of 61.35 (±20.32) years. The SE incidence was 15.2 %, categorized into two groups; convulsive SE and non-convulsive SE with 14.8% and 0.4%. The acute symptomatic seizures were the most common causes, with 90.7%. The mortality rate was 48.7%. The clinical factors that statistically significantly affected the outcome were age, complications during admission, and low AEDs level. Patients were 1.03 times higher for poorer outcomes per year, increased in age (P-value 0.007), and 16.64 times higher (P-value < 0.001) among those with complications during the admission. The common complications were a respiratory failure, pneumonia, and septicemia.

Conclusion: According to the new definition of SE, older age and complications during the hospital stay have potential associated with poor neurological outcome. In contrast, the epilepsy patient who had SE due to a low AEDs level seems to have a better prognosis. The acute symptomatic seizure were still the most common cause of status epilepticus, and infection.

Thai SCOPA and MPDSS; Two Scales for Assessment of Night Sleep Disorder Compare by PSQI in Parkinson's Disease at the Faculty of Medicine Vajira Hospital

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Abstract

Introduction: The sleep disorders in Parkinson patients affect the patient's quality of life. The Thai translated versions are MPDSS test, which was adapted from PDSS, and SCOPA-Sleep scale.

Objective: We are interested in comparing both tests to see which test is more appropriate to assess night sleep quality of Parkinson patients, by using the PSQI sleep test as a standard of sleeping assessment.

Methods: Cross-sectional study. Enrolling 200 patients diagnosed with Parkinson's disease who visit the out-patient clinic from March - December 2019 who met criteria research. The data were analyzed sensitivity, specificity of Thai SCOPA night sleep and MPDSS night sleep tests.

Results: The prevalence of SCOPA-NS test and MPDSS test is 62.5% (95%CI: 55.4 - 69.2) and 52.5 (95%CI: 45.3 - 59.6) respectively. SCOPA-NS test has a sensitivity of 83.1% (95%CI: 75.3-89.2), a specificity of 71.1% (95%CI: 59.5-80.9), a positive predictive value (PPV) of 82.4 % (95%CI: 74.6-88.6), and a negative predictive value (NPV) of 72% (95%CI: 60.4-81.8). Whereas MPDSS test has a sensitivity of 71.8% (95%CI: 63.0-79.5), a specificity of 78.9% (95%CI: 68.1-87.5), a positive predictive value (PPV) of 84.8% (95%CI: 76.4-91.0), and a negative predictive value (NPV) of 63.2% (95%CI: 52.6-72.8).

Conclusion: Both tests can be used to evaluate Parkinson patients with similar accuracy. Thai SCOPA-NS test showed more sensitivity than the MPDSS test but less specificity. However, patients significantly prefer doing the Thai SCOPA-NS test than MPDSS.

The Prevalence and Types of Postural Deformities in Thai Patients with Parkinson's Disease: A Single-Center Study

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Abstract

Background: Postural deformities (PostD), including anterocollis (AC), camptocormia (CC), and Pisa syndrome (PS), can be found. They can diminish the quality of life (QoL) in patients with Parkinson's disease (PD). The primary objective of our study was to address the overall prevalence of PostD in Thai PD patients. We compared clinical characteristics between PostD-PD and PD patients who did not meet the definition of either type of PostD (non-PostD). We compared the degrees of axial deviation for identifying the difference between non-PostD-PD and non-PostD-healthy volunteers (HVs).

Objectives: To address the overall prevalence of PostD in Thai PD patients.

Material & Methods: One-hundred Thai PD patients and 49 HVs were recruited. Abnormal postures were evaluated using a computerized measuring program which measured the angles of the neck (NF), upper thoracic, thoracolumbar (TLF), and truncal lateral flexion (LF) from their on-site digital photographs. AC, CC, and PS were defined. Clinical characteristics, MDS-UPDRS, gait velocity, cadence, and QoL, were assessed.

Result: Thirteen of 100 PD patients showed PostD, which mainly CC (n=11), whereas 2 of 49 HVs had PostD. PostD-PD showed significantly more severe motor symptoms than non-PostD-PD (modified H&Y of 3.0 vs. 2.5, MDS-UPDRS (posture) of 3.3 vs. 2.4, a summation of axial sub-scores of 11 vs. 10, and LEDD of 1000 vs. 608 mg). A comparison between non-PostD-PD and non-PostD-HVs showed that NF, TLF, and LF of 23, 17, and 5 degrees or more gave high specificities be PD (85.7, 93.9, and 95.9%, respectively). However, their sensitivities were low.

Conclusion: The most common PostD in Thai PD patients was CC. PostD-PD was associated with high disease severity. Our findings may raise awareness for early detection of PostD in PD, leading physicians to apply an early intervention for falling prevention and improving their QoL.

Prevalence of Advanced Parkinson's Disease in Thai Patients with Parkinson's Disease Using The Consensus on the Definition of Advance Parkinson's Disease (CEPA Study): A Single-Center Study

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Abstract

Background: Parkinson's disease (PD) is divided into early, mid, and advanced stages. Identifying each stage of PD especially on advanced PD (APD) is essential because the management of APD is needed to integrate various treatment modalities to control the disease's symptoms. Recently, there is a consensus of the definition of APD proposed by the CEPA study. Therefore, this study's primary aim was to identify the prevalence of APD in Thai PD patients using CEPA's definition. Demographic data, some motor and non-motor symptoms apart from those mentioned items in the CDEPA questionnaire, and treatment modalities, including oral and device-aided therapies (DATs), were reported.

Method: A retrospective medical record review of all registered PD patients at Movement disorders clinic, Siriraj Hospital, Thailand, was done from January 2016 to January 2020. All data were collected during "ON" time.

Results: The period prevalence of APD was 37.1% (208 out of 560), with male predominance (57.7%). The mean age (SD) of APD was 65.6 (9.6) years. The median durations of the disease and motor complications were 11.9 and 5.8 years, respectively. Most APD patients were in H&Y stage 3 (57.6%). The mean (SD) score of total MDS-UPDRS and median scores (IQR) of MDS-UPDRS part III were 70.1 (22.8) points and 32.0 (25.0,42.5) points. The median axial sub-score in APD patients was 11.0 (7.0,16.0) points. APD patients who fulfilled the indication for receiving DATs were 77.9% (162 of 208). Only eighty-seven patients (53.7%) received DATs, mainly deep brain stimulation (90.8%). The primary factor that prevented the patients from DATs was socioeconomic problems (72.0%).

Conclusion: The prevalence of APD was around one-third. Only half of APD patients who fulfilled the indication for receiving DATs could receive the treatments. These current results may raise awareness of identifying APD and may impact the process of patient care ranging from a level of individual patient care to a national APD treatment policy, which an ultimate goal is to provide proper clinical care to APD patients.

A Comparison between Subjective and Objective Measurements of Spasticity in CNS Inflammatory Demyelinating Diseases Patients in Siriraj Hospital

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Abstract

Introduction: Spasticity could occur in Central Nervous System Inflammation Demyelinating Diseaes (CNSIDD) due to damage or disruption to the area of the brain and spinal cord. For spasticity assessments were well describe in multiple sclerosis (MS). However, Asian population was a greater prevalence of Neuromyelitis Optica Spectrum Disorder (NMOSD) than MS. In practice, spasticity was also more common in NMOSD than in MS which was no Standardized spasticity assessment.

Objectives: This study aimed to compare between subjective and objective measurements of spasticity and to identify the clinical characteristics associated with spasticity among patients diagnosed with central nervous system inflammatory demyelinating diseases (CNSIDDs) at Siriraj Hospital.

Material and Methods: We performed the prospective cross-sectional study of CNSIDDs patients recruited from Siriraj Hospital between June and November 2020. Spasticity measurements were done by patients using Numerical Rating Scale (NRS) and by clinicians using Modified Ashworth Scale (MAS). Patient-reporting spaticity was evaluated with the associated clinical characteristics.

Results: Seventy-nine CNSIDDs patients was included for analysis, 25 with multiple sclerosis (MS), 53 with neuromyelitis optica spectrum disorder (NMOSD), and 1 with myelin oligodendrocyte glycoprotein antibody disease (MOGAD). There was a statistically significant correlation between subjective NRS scores and clinicians' MAS scores at visit (r=0.934, p<0.001). Spasticity was noted in 18 NMOSD patients (34%), compared with 2 MS patients (8%) (p=0.016). Clinical characteristics associated with spasticity included the higher number of transverse myelitis (TM) attacks, higher number of severe TM attacks, higher number of longitudinal extensive transverse myelitis (LETM) attacks (p<0.001), longer disease duration (p=0.025), higher Expanded Disability Status Scale (EDSS) score, and higher pyramidal Functional System Scale (FSS) score (p<0.001).

Conclusions: Patients' self-reported NRS score had a good correlation with clinicians' MAS score for the assessment of spasticity in CNSIDDs. NMOSD appeared to be more frequently with spasticity. Clinical characteristics associated with spasticity included the higher number of TM attacks, severe TM and LETM; longer disease duration; higher EDSS and pyramidal FSS scores.

Clinical Characteristics of Sleep Quality, Cognitive Performance, Brain Architecture in Thai Dementia Spectrum Disorders

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Abstract

Background: Sleep disorders are increased with advancing age. Poor sleep quality is a risk factor for cognitive decline and dementia.

Objective: To explore the relationship between sleep quality, sleep architecture and cognition. To investigate the association between brain volume and sleep parameters.

Materials and Methods: A total of 95 participants (70 female, mean age 67.18±10 years) were included in this study. Thirty participants were those with major cognitive disorder patients, twenty-five participants had mild cognitive impairment (MCI), and forty participants were normal controls. Sleep parameters were measured using wrist actigraphy and subjective sleep questioners. The participants were evaluated with high-resolution MRI to obtain brain volume. Demographic data, medical history, sleep characteristics, neuropsychological and mood evaluations were collected from participants.

Results: MCI patients had significantly lower sleep efficiency than cognitive healthy persons, 81.30±7.39 % vs. 85.12 ± 5.09 %, p=0.04. 66 % of the participants had poor sleep quality. Prevalence of probable REM sleep behavior disorder (RBD) and restless leg syndrome was high in dementia group. Longer sleep latency was associated with worse performance on global cognition. Poor sleep quality and poor sleep efficiency were not associated with regional brain architecture in cortical gray matter, subcortical gray matter as well as the hippocampus.

Conclusion: Sleep disorders were common in both cognitively healthy persons and dementia spectrum disorders. Lower sleep quality and disturbance of sleep maintenance were associated with the development of cognitive impairment. The causes and the consequences of poor sleep quality in patients with dementia spectrum disorders needed to be explored.

Keywords: Actiwatch, Dementia, Sleep disturbance, Insomnia, Neurocognitive disorders, Alzheimer disease, Neuropsychology, Magnetic resonance imaging

Neuropsychiatric Symptom in Stroke and Transient Ischemic Attack by Cognitive Status and Stroke Subtype

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Abstract

Introduction: Neuropsychiatric disorders are common complications post-stroke, the development of them in stroke patients are of great interest and are associated with worsened outcomes. Although many studies had examined neuropsychiatric disturbance in patients with stroke, there is relatively little data on the manifestations of neuropsychiatric symptoms in patients with different levels of cognitive functioning and stroke subtypes. Therefore, in this study, we aimed to characterize and assess post-stroke neuropsychiatric symptomatology using the NPI.

Objectives: 1) To examine the association of the frequency of neuropsychiatric symptoms and symptom clusters with different cognitive level and stroke subtype 2) To study the demographic, clinical data and neuropsychiatric profile in post stroke patients.

Materials and Methods: Patients aged 40 years or older admitted to Siriraj hospital between April and November 2020 with a diagnosis of stroke or TIA were eligible to participate in the study. Exclusion criteria were as following; patients who had aphasia, intubation or GCS below twelve. During third to seventh day of admission cognitive functions were evaluated using Thai Mental State Examination (TMSE), Montreal Cognitive Assessment (MOCA), IQCODE. NPI-Q was assessed at baseline, 3rd and 6th month.

Results: 103 patients were recruited. 77 (74.8%) and 26 (25.2%) patients were rated as having normal cognition and cognitive decline respectively. The most common stroke subtypes was small vessel disease 41 (39.8%). At the period of admission the most common neuropsychiatric symptoms was anxiety(23.3%) followed by nighttime behavior (22.3%), irritability (18.4%) and depression(13.6%). In both cognitive normal and decline groups and across all stroke subtypes the most frequent symptom cluster was mood disturbance. No significant relationship between frequencies of neuropsychiatric symptoms with cognitive decline group nor stroke subtypes was found (p>0.05).

Conclusion: In our study, frequency of neuropsychiatric symptoms were not increased with level of cognitive impairment. However, we found that anxiety was associated with small vessel disease. Moreover the severity of apathy in cognitive impairment patients were more than in normal cognitive group at admission and there was correlation between acute temporal lobe infarction and apathy.

Factors Associated with Hemorrhagic Transformation in Acute Ischemic Stroke Patients after IV Thrombolysis in Siriraj Hospital

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Abstract

Background: Thrombolytic therapy in acute ischemic stroke correlated with a significant net reduction in the proportion of patient dependent in activities of daily living, but increased in symptomatic intracranial haemorrhage. Therefore, identification of risk factors for developing postthrombolysis intracerebral haemorrhage can encourage physician to beware of the adverse event in patients with these risk factors.

Objective: To identify risk factors for postthrombolysis intracerebral hemorrhage in acute ischemic stroke patients in Siriraj hospital.

Methods: We retrospectively reviewed our database for patients with ischemic stroke treated with intravenous thrombolysis within 4.5 hours from symptom onset from January 2019 to November 2020. We reviewed clinical, NIHSS, blood test, ASPECT Score, mechanism of stroke. CT scans were performed at 24 hour after thrombolysis therapy or when neurological deterioration and were reviewed for the presence of hemorrhage based on criteria.

Results: 366 patients, mean age 64 ± 14 year, initial NIHSS 13 ± 8. Postthrombolysis intracerebral haemorrhage were detected in 87 (23.8%) patients. The significant risk factors were atrial fibrillation, higher blood sugar, higher initial NIHSS, presence of hyperdense MCA signs, presence of large vessel occlusion, area of ischemia or infarction, ASPECT less than 7, TOAST classification, anterior circulation stroke.

Conclusion: The significant risk factors for developing postthrombolysis intracerebral haemorrhage are atrial fibrillation, higher blood sugar, higher initial NIHSS, presence of hyperdense MCA signs, presence of large vessel occlusion, area of ischemia or infarction, TOAST classification, anterior circulation stroke. Patient who developed symptomatic postthrombolysis intracerebral haemorrhage had more severe degree of disability at 90 days.

Cognitive Changes after 1-2 Years Follow-Up in Non-Demented Thai Patients with Parkinson's Disease

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Abstract

Introduction: Cognitive impairment in Parkinson's disease (PD) are prevalent. No data on longitudinal change of cognition in Thai PD patients.

Objectives: We aimed to evaluate the change of cognition, perception of cognitive decline, and the diagnosis of cognitive impairment in non-demented Thai PD patients after 1-2 follow-up.

Materials and Methods: Non-demented, non-depressed PD patients were recruited. Cognition and apathy were assessed at baseline and 1-2 years follow-up. Montreal Cognitive Assessment-Thai (MoCA) was used to assess cognition. Perception of cognitive decline was assessed using the Cognitive Change Index by asking patients (CCI-S) and their informants (CCI-I). Apathy was evaluated by the Starkstein Apathy Scale-Thai. Association of MoCA, CCI-S, CCI-I, the discrepancy of CCI (CCI-D; CCI-S minus CCI-I), apathy score, and patient's clinical characteristics were analyzed.

Results: Sixty-two patients were followed for 18.59±4.55 months. The MoCA score insignificantly declined from 20.6±5.1 to 20.1±4.9 (mean changes -0.53±3.2, p=0.195). 47.1% of patients with normal cognition converted to PD-MCI. Most (77.8%) PD-MCI patients remained in the MCI stage, 11.1% turned to dementia, and 11.1% reverted to normal. Only the CCI-I and apathy score increased significantly after 1-2 years (p<0.01). At follow-up, the higher apathy score was significantly associated with the higher CCI-I and lower MoCA score (r=0.375 and -0.344, p<0.01). The CCI-D at follow-up was also significantly correlated with the worsening score of MoCA (r=-0.285, p=0.029). For clinical characteristics, patients with orthostatic hypotension had lower MoCA scores at follow-up (p=0.039).

Conclusion: Apathy, informant perception of cognitive decline, but not the cognition, was changed significantly in non-demented Thai PD patients after 1-2 years follow-up. Apathy, the discrepancy of perception of cognitive decline between patients and relatives, and orthostatic hypotension may associate with lower cognition, but further study is needed.

Evaluation of Clinical Impact of Pharmacogenomics Testing for Carbamazepine Prescription

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Abstract

Objective: To evaluate the clinical impact of HLA-B*15:02 testing for antiepileptic drugs (AEDs) prescription and predictions of AEDs-induced cutaneous adverse drug reactions (cADRs) in Thais.

Materials and methods: From June 2010 to January 2020, a retrospective observational cohort study was performed by retrieving data from electronic medical records. Patients with HLA genotyping (n=903) results were enrolled. After excluding non-eligible patients, the remaining patients (n=384) were identified. The relationships between the HLA genotyping results and carbamazepine (CBZ) prescription were analyzed. The ADRs and alternative AEDs used were obtained. Descriptive statistics were used to summarize the relevant data.

Results: A total of 384 patients were included in this study. The number of HLA genotyping tests per year increased significantly after the announcement from Department of Medical Sciences Thailand with pilot study to prevent SJS/TEN using pharmacogenomics testing. 5 of 70 patients with HLA CBZ risk alleles were prescribed with either CBZ or oxcarbazepine (OXC) but no cADR was reported. 189 of 314 (60.19%) patients without HLA CBZ risk alleles were prescribed with CBZ/OXC; 21 of which had cADRs. Alternative AEDs prescribed instead of CBZ/OXC included levetiracetam, sodium valproate, lamotrigine, gabapentin, phenytoin, topiramate, lacosamide, perampanel, and clobazam, respectively.

Conclusions: HLA genotyping can guide physician in CBZ and other AEDs prescription. CBZ/OXC prescription requires cADR monitoring. Although, HLA-B*15:02 is significantly associated with CBZ-induced SJS/TEN in Thais, but it cannot predict other cADRs, including MPE and DRESS.

Keywords: Carbamazepine, HLA-B*15:02, HLA genotype, Pharmacogenomics, Pharmacogenetics

A Clinical Score for Prediction In-Hospital Mortality and Clinical Outcomes of Status Epilepticus in Adults: The Comparative Retrospective Cohort Study

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Abstract

Objective: To compare the sensitivity and specificity of status epilepticus prognostic scores including STESS, mSTESS, and END-IT for predicting in-hospital mortality of status epilepticus (SE) patients.

Material and Methods: This was a single-center, retrospective cohort analysis, conducted from Jan 2014 to Dec 2019 at Ramathibodi Hospital. The participants were diagnosed with SE and underwent continuous EEG monitoring. SE patients with postanoxic SE, incomplete data, no EEG data were excluded. Prognostic scores were calculated on each patient and ROC curves were performed at each score. In addition, the optimal cutoff values for each score were considered. The performances of the values were compared in bar chart.

Results: A total of 119 patients were included in this study. Mean age was 59.76 years with the total of 58(48.7) men and 61(51.2) women. The worst SE types were 47 (39.4%) generalized convulsive SE, 65(54.6%) non convulsive SE in coma, and 7(5.8%) others. AUCs were similar for STESS (0.551; 95% CI, 0.442-0.661), mSTESS (0.583; 95% CI, 0.475-0.691) and END-IT (0.532; 95% CI, 0.425-0.640) for prediction of in-hospital mortality. However, the capacity of these 3 scores was still unsatisfactory for in-hospital mortality prediction due to the low AUCs. The optimal cut-off values were 4 for STESS, 5 for mSTESS, and 4 for END-IT with mSTESS optimal values showed the best performance from high PPV, NPV and sensitivity.

Conclusion: The SE prognostic scores (STESS, mSTESS, END-IT) demonstrated similar results for predicting in-hospital mortality. Further studies on prognostic scores are suggested to facilitate the better clinical treatment decisions.

Keywords: Status epilepticus, Prognostic score, STESS, mSTESS, END-IT, Mortality

Evaluation of Motion Perception in Cognitive Impairment Using Rama Motion Perimetry

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Abstract

Objective: To evaluate motion perception in patients with Alzheimer's disease (AD) and other types of dementia.

Materials and Methods: This was a single-center, cross-sectional study. The study included 31 patients with cognitively impaired (16 females [51.61%], age 53 - 84 years [mean 68], MOCA 10-27 [mean 21.52]) and 31 healthy controls (18 females [58.06%], age 53 - 86 years [mean 70], MOCA 25-30 [mean 27.45]). The cognitively impaired group was further classified into dementia and mild cognitive impairment (MCI) subgroups. All participants underwent cognitive examinations using Montreal Cognitive Assessment and RAMA motion perimetry tests. The primary outcome was percent correction in the motion perimetry.

Results: The mean motion perimetry percent correction of the cognitively impaired group was significantly smaller than that in the controls (the mean difference of -18.18, 95% CI -30.24 to -6.12, p=0.004). The post-hoc analysis revealed that there was a statistically significant difference in percent correction in motion perimetry between the dementia and control groups (p-value=0.001); and between the dementia and MCI groups (p-value=0.011). The multiple linear regression model showed that age (P=0.004) and MOCA scores (P<0.001) were significantly associated with percent correction in motion perimetry.

Conclusion: Motion perception was affected in cognitively impaired patients, particularly in the dementia subgroup. There was a significant correlation between percent correction in motion perimetry and MOCA scores. Motion perimetry can serve as a potential biological marker for cognitively impaired patients. Further follow-up studies are required to clarify this matter.

Keywords: Alzheimer's disease, Mild cognitive impairment, Dementia, Motion perimetry

Factors Influencing Clinical Outcomes in Autoimmune Myopathy

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Abstract

Background: Idiopathic Inflammatory Myopathies (IIM) are heterogeneous autoimmune muscle disease which can be classified into five subgroups. Each subgroup has different clinical and laboratory findings and treatment outcome.

Objectives: The objective of this study is to identify factors influencing clinical outcome in Thai patients with IIM.

Materials and Methods: This is a retrospective cohort study. All IIM patients at Ramathibodi Hospital between January 2009 and December 2020 were recruited. All relevant clinical factors were retrospectively reviewed. Primary outcome was clinical response at 12 months after treatment which was assessed by Total Improvement Score (TIS). The quantitative muscle strength at baseline and 12 months after treatment were measured by Manual Muscle Testing 8 version (MMT8) score (0-80). Univariate and multivariate analysis were used to identify the associations between clinical factors and the primary outcome.

Results: There were 38 patients in this study. The median age was 57.5 (17.0-88.0) years, 71.1% were female. There was an increasing number of IIM patients with significant clinical response after treatment at 1, 3, 6 and 12 months (23.7%, 55.3%, 89.5% and 84.2% respectively). Factors that associated with significant improvement from multivariate analysis were shorter time from symptom onset to treatment, symmetrical proximal muscle weakness pattern, and manual muscle testing score (MMT8) at baseline. Factors that associated with clinical response at 12 months were shorter time from symptom onset to treatment and MMT8 change after treatment.

Conclusion: The significant clinical response of IIM treatment depends on the early diagnosis and treatment and the clinical muscle strength improvement during treatment regardless of subtype of IIM and regimens of treatment.

Keywords: Autoimmune myopathy, Idiopathic inflammatory myopathy, Thailand, Factors, Outcomes, complications

Cost Effectiveness of Epilepsy Surgery in Drug-Resistant Epilepsy

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Abstract

Objective: This study aimed to demonstrate the cost-effectiveness of epilepsy surgery in drug-resistant epilepsy (DRE) patients by comparing relevant data and costs between anti-epileptic drugs (AEDs) treatment group and epilepsy surgery group.

Materials and methods: From January 1, 2014 to September 30, 2018, a retrospective cohort study was performed by retrieving Ramathibodi Electronic Medical Records of epileptic patients (n=4,400). After exclusion, a number of 132 DRE patients were eligible for analysis and further divided into medical treatment group (n=44) and epilepsy surgery group (n=26). The cost-effectiveness, seizure reduction, seizure freedom, and changes in numbers of AEDs usage were analyzed. Chi-square test and independent samples t-test were used in this study.

Results: Overall cost at 2-year follow-up was not statistically significant between medical treatment group (267,505.59±151,241.8) and surgical group (267,557.39 ±124,743.03), p = 0.999. At 2-year follow-up, there was no significant changed in the number of seizures per month in both groups (30.98±70.12 in medical treatment and 7.12±18.34 in surgical treatment, p=0.094). Incident rate ratio in medical treatment group compared to surgical treatment group was 17.0178 (95%CI, 16.561-17.486, p < 0.001). Comparing to baseline, the trend for a reduction in numbers of AEDs usage, and urgent hospital visits were noted in surgical group.

Conclusions: Epilepsy surgery is cost-effective in increase chances of seizure freedom during two-year follow-up, and probably resulted in a greater reduction of numbers of AEDs usage and urgent hospital visits. Therefore, epilepsy surgery should be recommended for surgically eligible DRE patients.

Keywords: Drug-resistant epilepsy, Epilepsy surgery, Cost-effectiveness

Efficacy and Safety of Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Ischemic Stroke and Atrial Fibrillation Who Concurrently Take Antiepileptic Drugs

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Abstract

Background: Most antiepileptic drugs (AEDs) were contraindicated in co-administration with NOACs because of potential interactions that may cause an increased risk of bleeding or reduced antithrombotic efficacy. Epileptic seizures following ischemic stroke are common. So far, there was limited evidence of NOACs and clinical outcomes in patients who concurrently use AEDs.

Objectives: The study aims to compare both efficacy and safety outcomes in stroke patients who required NOACs with AEDs with patients who on NOACs alone. Recurrent rates of ischemic stroke and bleeding during 1-year period are the clinical outcomes.

Materials and Methods: A retrospective cohort clinical study was conducted at Phramongkutklao hospital between January 2016 to January 2021. Patients with AF and history of ischemic stroke who on NOACs for secondary prevention were enrolled and assigned into concomitant AEDs group and no AEDs exposure group (control). The incidence of recurrent ischemic stroke and bleedings during the 1-year period were recorded by review the medical records.

Results: A total of 186 eligible patients were enrolled. 94 patients were assigned into concomitant AEDs group and 92 patients were assigned into no AEDs exposure group (control). The incidence of recurrent ischemic stroke within one year was higher in the no AEDs group, however there was no statistically significance between both groups (5 cases vs. 2 cases, OR=2.53, 95% CI, 0.48 to 13.37; *p=0.44*). For safety outcome, there were 11 events of minor bleeding in the AEDs group and 4 events in the no AEDs group but there was no statistically significant difference in any bleeding between groups (OR=2.92, 95% CI, 0.89-9.52; *p=.10*).

Conclusion: The incidence of recurrent ischemic stroke and bleeding were not significantly different in AF patient who take NOACs concomitant with AEDs and NOACs alone group. So, it may be reasonable to safely use AEDs with NOACs to treat epilepsy in patient with stroke.

Development of the Thailand Version of the Athens Insomnia Scale (AIS-Thai)

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Abstract

Background: Insomnia is a common condition in clinical practice. Athens Insomnia Scale (AIS) is a simple questionnaire for insomnia assessment.

Objectives: The aim of this study was to develop and validate a Thai version of the Athens Insomnia Scale (AIS-Thai) and a modified Athens Insomnia Scale (modified AIS-Thai).

Materials and Methods: The AIS-Thai was created using a back translation design. The modified AIS-Thai was also developed to a more simplified version. Twenty patients (10/20 had insomnia) were enrolled at our outpatient neurology clinic. The participants completed 2 questionnaires for 2 times. Test-retest analysis using intraclass correlation coefficient (ICC) and ROC curve were performed.

Results: The AIS-Thai and modified AIS Thai were developed. The ICC varied from 0.64-0.93 in AIS-Thai and 0.68-1 in the modified AIS-Thai group. Higher scores were found in people with insomnia. The AIS-Thai and modified AIS-Thai had cut-off values for identifying pathological insomnia at 7 and 11, respectively.

Conclusion: The AIS-Thai and modified AIS Thai are reliable and valid for assessing insomnia among Thai population.

The Effects of Thai Traditional Triangle Pillow and Self-Positional Therapy in Treating Positional Obstructive Sleep Apnea: A Pilot Study

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Abstract

Objectives: Positional obstructive sleep apnea (POSA) is common, affecting sleep quality. This study was to identify the efficacy of using a Thai traditional triangle pillow, as a position device, and self-positional therapy in POSA.

Methods: This open label, self-control prospective intervention study enrolled adult patients with POSA. The self-positional therapy had performed for 8 weeks, followed by using the triangle pillow for 8 weeks. Primary outcome was to measure changes in Epworth sleepiness scale (ESS) score and secondary outcomes included quality of life measured by 36-Item Short Form Health Survey (SF-36) and problems/complaints while studying.

Results: Total of 10 patients, mean age was 55.8 years old (SD 11.3), male was 6 cases (60%) and average apnea-hypopnea index (AHI) was 26.1, supine-AHI of 35.3, non-supine-AHI of 8.6. Baseline average ESS was 10 (SD 3.5). The self-positional therapy did not improve ESS score; the mean difference in ESS score was +0.20 (95% CI -2.01 to 2.41, *p*-value 0.84). The pillow group had significantly reduced in ESS score [-3.6 (95% CI -5.00 to -2.20)], *p*-value < 0.001. The pillow group had also significantly reduced the ESS score when compared with the self-positional therapy, ESS reduction of -3.8 [95% CI -6.47 to -1.13], *p*-value 0.011. The quality of life improved only in the pillow group. There were no complaints from the patients related to both positional therapies.

Conclusions: The Thai traditional triangle pillow as a positional device in treating patients with positional obstructive sleep apnea is effective and comfortable.

Role of Progesterone in Lennox-Gastaut Syndrome and Refractory Epilepsies: A Pilot Study

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Abstract

Introduction: Most patients with LGS and refractory epilepsies often achieve unsatisfactory seizure activity control. Previous studies have shown that neurosteroids (progesterone in this study) can improve seizure control but the effects on patients with LGS have not been well studied.

Objectives: To study the efficacy of progesterone in reducing seizure frequency in patients with LGS and refractory epilepsy, as well as adverse reactions.

Materials and Methods: This was a prospective open-labeled pilot study conducted in Phramongkutklao Hospital from January 1 to December 31, 2020. We selected patients with LGS and adults with refractory epilepsies who were receiving at least 2 AEDs and still experiencing at least 5 epileptic attacks a month. The patients were assigned progesterone 400 mg/day. Seizure frequency and seizure type were recorded at baseline and every month for 3 months. The primary outcome was seizure frequency. Adverse drug reactions were observed as a secondary outcome.

Results: Total of 6 patients were enrolled. There were 3 LGS and 3 adults with refractory epilepsy. In LGS group, the median overall seizure frequency (times/month) were 197 for visit baseline and 200 for visit 3 months. In adults with refractory epilepsy group, the median overall seizure frequency (times/month) were 4 for visit baseline and 3 for visit 3 months. There were 2 adverse events detected which were mild headache (1 subject, 20%), and depression (1 subject, 20%). There were no serious adverse reactions.

Conclusions: From our small-scale study, after receiving progesterone 400 mg/day for 3 months, seizure frequency in patients with LGS and refractory epilepsy was not reduced from baseline. No serious adverse event was noticed. Further studies with proper dosage or longer duration of use would need to be conducted for demonstrating a clearer effect.

Postictal Change from MRI Corresponding with Localized Related Focal Epilepsy in Prasat Neurological Institute

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Abstract

Background: Focal epilepsy is common condition especially temporal lobe epilepsy in adult. In the previous studies reported the postictal MRI change after status epilepticus, tumor related focal epilepsy and some temporal lobe seizure. Almost studies, report postictal MRI change without demonstrating EEG findings in index seizure. To identify truly change in MRI after well-defined clinical seizure and ictal EEG onset are our aim of this study.

Objective: To describe the seizure semiology, interictal EEG, ictal EEG and correlation with transient signal changes in MRI after seizure. We hypothesized that postictal change from MRI might well localized around the seizure onset zone.

Methods: We retrospect analyzed patients with temporal lobe epilepsy (n=10) and non-temporal lobe epilepsy (n=2). All patients had 3T MRI epilepsy protocol at least 2 times. All of them admitted at Prasat Neurological Institute for pre-surgical evaluation purpose. The index seizures were identified and post-ictal MRI must performed after seizure within 90 minutes are included. We designed to report the signal change in MRI included DWI, ADC, T2, T2 FLAIR and analyzed visually.

Results: Twenty medical records were identified and only 10 patients in TLE group and 2 patients in non-TLE group met criteria and were analyzed. Mean of all patients are 29.5 years. There were no difference in gender. The estimated time from index seizure to do MRI ranged from 31 to 80 minutes (median 52.8) in TLE. Time to do MRI are 45 and 52 minutes in non-TLE. Even though, variety of clinical seizure and pattern of EEG spreading in both groups, there were totally no any signal change have seen in all sequences of MRI.

Conclusion: We could not demonstrate any signal change in DWI, ADC, T2 or T2 FLAIR from MRI 3 tesla after well-identified seizure even clinical seizure or ictal EEG onset. Interpretation of postictal change in MRI for these 4 sequences should be careful.

Keywords: Postictal MRI change, Temporal lobe epilepsy, Postictal, Postictal change, Focal epilepsy

The Efficacy of the Newly Invented Multi-Textured Puzzles Improving Visuospatial Memory and Attention in Medical Personnel with Mild Cognitive Impairment

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Abstract

Objectives: To invent the new multi-textured puzzles which adding tactile stimulation to conventional puzzles and to study the effectiveness of these newly invented devices in enhancing visuospatial memory and attention in the medical personnel with mild cognitive impairment (MCI).

Material and Methods: 4 multi-textured puzzles were created. 26 medical personnel in Prasat neurological institute with MCI were recruited in the study. They were randomized into 2 groups with a 1:1 allocation. The intervention group played the multi-textured puzzles once a week for 8 weeks consecutively, while the control group received only the medical suggestions. The primary outcomes included visuospatial memory (measuring block design test score), and attention (measuring digit spanning and spatial spanning test scores) and the secondary outcome evaluated the MoCA score. We compared the pre-tests and the post-tests scores of those cognitive tests.

Results: A set of multi-textured puzzles was created. By playing the set of puzzles, this study showed an improvement in the block design test which was statistical significance (different median score 2.0 and 0 ($p = 0.003$) in the intervention and the control group, respectively). The improvement in the digit spanning, and the MoCA score, comparing between 2 groups, was observed but without statistical significance.

Conclusion: Our study demonstrated that playing the newly invented multi-textured puzzles once a week for 8 weeks consecutively improved the visuospatial memory, and possibly the attention in patients with MCI. We can apply these devices to whom concerned with mild cognitive problems.

Clinical Characteristics of Temporal Lobe Epilepsy with Amygdala Enlargement among Drug-Responsive versus Drug-Refractory Patients

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Abstract

Background: Temporal lobe epilepsy with amygdala enlargement (TLE-AE) has been reported as non-lesion mesial temporal epilepsy. Previous studies reported that (TLE-AE) clinical characteristics might differ from typical hippocampal sclerosis.

Objective: To evaluates and compares TLE-AE clinical characteristics between drug-responsive and drug-resistant epilepsy.

Materials and Methods: Retrospective studies of 32 TLE-AE patients. in Prasat Neurological Institute between 2015-2020. Demographic data, seizure type, MRI studies, EEG, serology testing, anticonvulsive drug, type of immunotherapy were compared between drug-responsive and drug-resistant epilepsy patients.

Results: Thirty-two patients were clinically diagnosed as TLE-AE. Of these, 24 patients were drug-responsive epilepsy. Twenty-five patients were evaluated with paraneoplastic studies (78.13%), seven patients were positive autoantibody (21.88%). The patients' ages and the ages at seizure onset in drug-refractory epilepsy significance younger than in drug response epilepsy, and the paraneoplastic was positive only in drug response epilepsy.

Conclusion: AE is the discrete form of TLE. Clinician should consider when evaluating the etiology of AE in TL. Based on our findings, the clinical context, such as ages, ages of initial treatment, response to AEDs, and initial seizure frequency, might differ between drug-responsive and drug-resistant patients. Our results added that a positive paraneoplastic test might help predict a good prognosis in TLE-AE patients in addition to traditional workup.

Clinical Features and Long-Term Outcomes of Patients with Anti-VGKC Antibody in Prasat Neurological Institute

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Abstract

Background: Anti-VGKC antibody-mediated (LGI1 and Caspr2) neurological disease is now increasingly recognized in Thailand. They have a variety of clinical manifestations and may be the paraneoplastic syndrome. However, the clinical data and outcomes of this disease in Thailand are still limited.

Objective: To describe the clinical feature of patients with anti-VGKC antibody and to compare the clinical differences and long-term outcomes between the patients with LGI1 and Caspr2 antibody.

Methods: Retrospective study of patients with detected anti-VGKC antibody in Prasat Neurological Institute, between January 2012 and June 2020. Demographic data, clinical presentations, serum and CSF anti-VGKC antibody profiles, cognitive tests, brain imaging results (MRI), basic CSF analysis, neurophysiological results (both EEG and EMG), coexisting autoantibody, serum sodium, and malignancy detection were collected in each group of patients with LGI1 and Caspr2 antibody.

Results: Twenty eight patients with detected anti-VGKC antibody were identified, including LGI1 antibody in 24 patients (86%) and Caspr2 antibody in 4 patients (14%). The patients with LGI1 antibody presented predominantly with cognitive impairment ($p = 0.002$) whereas patients with Caspr2 antibody presented predominantly with peripheral nerve hyperexcitability ($p < 0.001$) and neuropathic pain ($p < 0.001$). Majority of the patients with both antibodies also had seizure, but the hyponatremia was found exclusively in the patients with LGI1 antibody ($p = 0.01$). The LGI1 and Caspr2 antibody were found in serum in all patients (100%) but found in CSF in 96 and 75% respectively. The majority of them had temporal lobe abnormalities in MRI brain. The malignancy was found in 17% of the patients with LGI1 antibody, but none in the patients with Caspr2 antibody. The seizure was better controlled by 6 months after therapy in the patients with LGI1 antibody and the majority of the patients with both antibodies had favorable functional status (MRS 0-1) after 6 and 12 months after therapy. The cognitive outcome in the patients with LGI1 antibody showed 50% improvement with the increasing score of TMSE and MOCA tests but 20% of patients still had TMSE below 24 after 12 months of therapy.

Conclusions: According to our study, the patients with LGI1 antibody presented predominantly with cognitive impairment and hyponatremia, whereas the patients with Caspr2 antibody presented predominantly with peripheral nerve hyperexcitability and neuropathic pain. Long-term cognitive function in LGI1 encephalitis patients had modest outcome.

*Keyword*s: Antibody-mediated neurological disease, Anti-voltage-gated potassium channel antibody (anti-VGKC antibody), Leucine-rich glioma-inactivated 1 antibody (LGI-1 antibody), Contactin-associated protein-like 2 antibody (Caspr2 antibody)

The Etiologies, Clinical Course, Treatment Results and Prognosis of New-Onset Refractory Status Epilepticus (NORSE) Patients in Prasat Neurological Institute

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Abstract

Background: Refractory status epilepticus (RSE) is the condition of continuous seizure that failed to stop with appropriate two or more antiepileptic drugs (AEDs) and require anesthetic agents. RSE has evidence may relate to paraneoplastic or immune-mediated encephalitis. This disorder found in healthy patients. In this research, we aim to understand the disease and to find an effective treatment options.

Objective: To describe the demographic, clinical characteristics, laboratory investigations, result of the treatment, and prognosis of new-onset RSE (NORSE) patients.

Materials and Methods: A retrospective single-center analysis of 83 refractory seizure patients with and without plasma exchange treatment who were admitted in ICU from January 2015 to December 2019 at Prasat Neurological Institute.

Results: Of 83 patients, only 20 suited the criteria. Fever and headache were found in NORSE cases 95% and 75%. Almost all patients 95% were present with generalized convulsion before admission, and 75% had abnormal MRI Brain and CSF features. To compare with Non-PLEX, the PLEX group was associated with lower Barthel Index after treatment, the average score is 12.5, and higher mortality 3 out of 10 patients, but no statistically significant (p=0.906 and 0.582, respectively).

Conclusion: The most common prodromal symptom in NORSE are fever and headache followed by the first episode of generalized convulsio. There are evidence of MRI brain abnormalities and CSF pleocytosis mostly presented. Despite the very severe of RSE but 80% of our patients survive, and had seizure reduction. Thus, the early diagnosis and aggressive proper managements could promoted survival outcome, seizure outcome and quality of life.

Keywords: Epilepsy, Status epilepticus, Refractory status epilepticus, New onset refractory status epilepticus, NORSE

The Phenotypic, Clinical Course and Treatment Response to Disease Modifying Therapy in Multiple Sclerosis Patients

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Abstract

Background: Multiple sclerosis (MS) is a chronic inflammatory disease of the central nervous system which leads to significant disability and economic burden to the patient, family, health system, and society.

Objective: This study describes the demographics, natural history, and effectiveness of disease-modifying therapies in multiple sclerosis patients.

Methods: This is a retrospective cohort study of patients diagnosed with multiple sclerosis in Prasat Neurological Institute, tertiary referral neurological center in Bangkok, Thailand, between June 1, 2010, to June 30, 2020. The demographic data, clinical characteristics, and disease course of multiple sclerosis were explored. The primary endpoint of this study was to compare time to events of clinical relapse, new MRI T2W activity, new MRI T1W with Gd enhancement, and time to disability progression, between patients who receive disease modifying therapy (DMT) and without DMT.

Results: There were 102 patients whose diagnosis were multiple sclerosis. Female to male ratio was 2.4:1. The mean age at onset was 29.61±11.62 years. The phenotypic features of these patients were classified as;80.4%, SPMS;8.8%, PPMS;3.9% and tumefactive demyelination;6.9%. Fourty eight patients (58.5%) received DMT including 25(52.1%) had received IFN-beta, 15(31.2%) had received fingolimod, and 8(16.7%) received teriflunomide. The primary endpoint demonstrated patients who received DMT had significantly delay clinical disability compared with patients who did not receive DMT (HR 3.08; 95% CI 1.05-9.04;P=0.04). However, time to clinical relapsed and MRI activity including, new T2W and new T1W Gadolinium (Gd) enhancing lesion, were not significantly difference between 2 groups

Conclusion: Patients with relapsing-remitting phenotype tend to progress to severe disability within ten years. Treatment with DMT is one of the possible factors to delay disability progression in patients with MS.

Keywords: Multiple sclerosis, Phenotype, Natural history, Disease modifying therapy

Valproic Acid Level and the Other Risk Factors Enhancing Hyperammonemia of Non-Hepatic Disorder Patients Using Valproic Acid in Prasat Neurological Institute

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Abstract

Background: Valproic acid is widely used for the treatment of epilepsy, migraine and variety of psychiatric symptoms. Valproic acid induce hyperammonemia occur in up to 50% of valproic acid treated patients, some of whom may become encephalopathy that increase morbidity and mortality.

Objective: We aimed to determined valproic acid level, prevalence rate and risk factors for valproic acid induce hyperammonemia and/or encephalopathy in non-hepatic disorder patients.

Methods: Retrospective single-center analysis of 72 patients with non-hepatic patients using valproic acid from January 1st, 2017 to December 31th, 2019 at Prasat Neurological Institute. Demographic data, blood for valproic acid level, total daily dose, ammonia level, associated neurological symptom, investigations and concurring medications were recorded and analyzed.

Results: There are 54 out of 72 patients consider to have valproic acid induce hyperammonemia, and 16 out of 54 patients with hyperammonemia had hyperammonemic encephalopathy. In 54 patients of hyperammonemia group, almost of them are asymptomatic and mild symptoms. Patients with high total daily dose of valproic acid (2000mg/day p=0.051) and valproic acid level (>100ug/ml) (27.8% p=0.615) are trend to associated with hyperammonemia. In hyperammonemic encephalopathy, we found female gender (87.5%), baseline encephalopathy (100%) and total valproic acid daily dose 2400 mg or more, are the risk factors.

Conclusion: Valproic acid induce hyperammonemia is relatively high in epilepsy patient populations. The total number of concurrently used antiepileptic drugs and total daily dose of valproic acid associated with increase blood ammonia level. Female gender, baseline encephalopathy and total daily dose valproic acid are the significant risk factors for developing valproic acid induce hyperammonemic encephalopathy. Dose of valproic acid adjustment, monitoring of valproic acid level and serum ammonia, early detection of hyperammonemia and hyperammonemic encephalopathy, these are helpful.

Keywords: Valproic acid, Valproate, Hyperammonemia, Hyperammonemic encephalopathy

The Pilot Study of the Government Pharmaceutical Organization (GPO) Cannabis Extracts for Multiple Sclerosis (MS) Spasticity Treatment in Thailand

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Abstract

Background: The prevalence of spasticity in multiple sclerosis patients is nearly 90%. Most of the patients didn't respond to the current anti-spastic drug.

Objective: The objective of this study is to evaluate the efficacy and safety of Government Pharmaceutical Organization cannabis extraction (GPOCE) in the treatment spasticity of MS patients in Thailand.

Materials and Methods: The prospective pilot study in the patient diagnosis with MS, who not relived spasticity under current anti-spastic treatment, was performed between November 2019 and June 2020. The GPOCE formulation of THC: CBD1:1 was administration in all patients. The treatment outcomes were determined at 12 weeks to compare with their baseline.

Results: Seven patients participated in the study. Among these, two patients were withdrawn from this study after receiving only a small dose of GPOCE. Finally, five patients were included in the final analysis. The primary outcome was the reduction in modified Ashworth score (MAS) was decreased from baseline 15 (IQR 12-19) to 6 (IQR 1-12) (p=0.043). The key secondary outcome was a clinically relevant response (CRR), which define by reduction of spastic Numeric rating scale (NRS) of spasticity more than thirty percent compared to baseline. Four patients (80%) achieved CRR. Moreover, the overall NRS of spasticity decreases forms the median 6 (IQR5-7) to 2 (IQR2-3). The reduction of other NRS parameters, including fatigue, pain, tremor, sleep, spasm, anxiety, and depression, were also observed after treatment. Moreover, GPOCE was generally well tolerated.

Conclusion: GPOCE is useful to treat spasticity in a patient with MS. The safety profile is acceptable under the supervision of the health care provider.

Keywords: Multiple sclerosis (MS), Cannabis extract, Spasticity

Incidence of Nosocomial Infections in Patients with Autoimmune Encephalitis at KCMH Hospital Receiving PLEX and IVIG

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Abstract

Introduction: At present, evidence-based medicine has concluded that current standard first line therapy for autoimmune encephalitis is intravenous immunoglobulin (IVIG) or plasma exchange (PLEX) concurrent with corticosteroids. However, the advantages and disadvantages of the two approaches still lack definitive data. Here we have summarized comparative data from infection to hospitalization between the two treatment approaches.

Objectives: To study the incidence of hospital acquired infections, hospital stay and disability during acute management among autoimmune encephalitis patients who have undergone IVIG and PLEX admitted to King Chulalongkorn Memorial Hospital (KCMH) between 2015 to 2020.

Materials and Methods: Prospective and retrospective cohort study was conducted to study the incidence of infection, hospital stay and disability in autoimmune encephalitis patients 15 years or older who were admitted to King Chulalongkorn Memorial Hospital from January 2015 to December 2020.

Results: Hospital acquired infections in IVIG group were significantly less than PLEX group (p = 0.032). Primary septicemia was found to be the most frequent cause of infections for both groups. Moreover, the length of hospital stay in the PLEX group was longer than in the IVIG group, regardless of the duration of the treatment course (p = 0.032). There were no significant differences in MRS before discharge in both groups.

Conclusion: We conclude that receiving IVIG has less nosocomial infections, which means shorter hospital stays and potential cost savings. However, the outcomes were not different in both groups.

The Effect of Light on Gait Parameters in Patients with Parkinson's Disease

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Abstract

Background: Falling in patients with Parkinson's disease (PD) mostly occurs during the nighttime. The effect of light on gait abnormalities that might contribute to falling in PD has never been explored.

Objective: To determine the effect of light on gait parameters in PD and compare to controls.

Method: 34 PD patients and 8 age-matched healthy controls were recruited in the study. Gait parameters were objectively assessed by the electronic walkway system (GAITRite®). Participants were asked to walk in two situations; the bright situation with the light intensity above 100 lux and the dark situation with the light intensity below 20 lux. Outcomes including normalized walking velocity, stride length, step length, double support time, and cadence were compared between bright and dark situations in each group. The percentage of differences in gait parameters between bright and dark situations were also compared between patients and controls

Result: PD patients had significantly decreased normalized velocity (p<0.01), shorter stride length (p<0.01) and step length (p<0.01) but increase double support time (p<0.01) in the dark compared to the bright situation. In contrast, healthy controls showed significant increase normalized velocity (p <0.01) and cadence (p = 0.01) with decreased double support time (p = 0.04) in the dark situation. The percentage of differences in gait parameters between bright and dark situations were opposite in PD compared to controls.

Conclusion: Our study demonstrated that gait abnormalities were worsen in the dark compared to bright situations in PD , indicated the important effect of light in these patients.

Resolution Time of Hemorrhagic Transformation Detected by CT Brain in Acute Ischemic Stroke Patients Receiving Intravenous Thrombolytic Drug in King Chulalongkorn Memorial Hospital

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Abstract

Introduction: Hemorrhagic transformation (HT) of acute ischemic stroke is an important complication of thrombolytic and antithrombotic therapies, resulting in neurological deterioration and worse outcomes. To our knowledge, there was no study regarding time to radiographic resolution of hemorrhagic transformation after cerebral infarction. In this single - center, retrospective cohort study, our aim was to study the radiographic resolution of hemorrhagic transformation and its clinical predictors.

Materials and Methods: A retrospective study was performed in patients with acute ischemic stroke who had hemorrhagic transformation detected by CT brain in the first 24 hrs after receiving intravenous thrombolytic and were admitted to King Chulalongkorn Memorial Hospital between January 2009 to June 2018. Demographic , clinical and laboratory data including follow - up imaging data were collected. Follow - up CT brain were performed based on the decision of attending physicians.

Results: There were 710 patients with acute ischemic stroke receiving intravenous thrombolytic drug. Hemorrhagic transformation detected by CT scan within 24 hours was found in 105 patients. A total of 80 acute ischemic stroke patients were included in this study. Median time to radiographic resolution for overall group was 18 ± 16.16 days. Median time to radiographic resolution for group HI1 was significantly less than that of other groups (9.5 vs 20.5, p - value = 0.037). About half of patients in HI1 group (50 %) had radiographic resolution at day 7 - 10 and about three - quarters (71.4 %) had resolution at day 15 - 30. More than half of patients in HI2 group (58.8 %) had radiographic resolution at day 15 - 30.About half of patients in PH1 (48.0 %) and PH2 group (54.1 %) had radiographic resolution at day 15 - 30 and 30 - 90, respectively.

Conclusion: In this study, we found that patients with HI1 in the first 24 hours after detection of hemorrhagic transformation had shorter time to radiographic resolution than patients in other groups (HI2, PH1 and PH2). The median time to resolution was about 10 days. For the other three groups, the median time to radiographic resolution was about 20 days. These findings might be translated into clinical practice to obtain follow - up imaging for asymptomatic or stable symptomatic hemorrhagic transformation patients at about 10 days for patients with HI1 and about three weeks for patients with HI2, PH1 or PH2.

Wearable Smartwatch and Data-driven Predictive Models for Seizures

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Abstract

Introduction: Uncontrolled epilepsy were significantly associated with sudden unexpected death epilepsy (SUDEP) and status epilepticus. Accurate seizure counts and real time alert are important for appropriate management.

Objective: To describe extracerebral characteristics of overall and various seizure types as compared with baseline physical activities using multimodal devices (Empatica E4); develop predictive models for overall and each seizure type; and assess diagnostic performance of each model.

Materials and Method: We prospectively recruited patients with focal epilepsy who were admitted in epilepsy monitoring unit for presurgical evaluation during January to December 2020. All were simultaneously applied a gold standard long-term video-electroencephalography (vEEG) monitoring and an index test E4. Two certified epileptologists independently determined whether captured events were seizures and then indicated ictal semiology and EEG information. Both were blind to multimodal biosignal findings detected by E4. Biosignals during 5-minute epochs of both seizure events and baseline were collected and compared. Predictive models for occurrence of overall and each seizure type were developed using a generalized estimating equation. Diagnostic performance of each model was then assessed.

Results: Thirty patients had events recorded and were recruited for analysis. One-hundred and eight seizure events and 120 baseline epochs were collected. Heart rate (HR), acceleration (ACC), and electrodermal activity (EDA) but not temperature (TEMP) were significantly elevated during seizures. Cluster analysis showed trend of greatest elevation of HR and ACC in bilateral tonic-clonic seizures (BTCs), as compared with non-BTCs and isolated auras. HR and ACC were independently predictors for overall seizure types, BTCs, and non-BTCs, whereas only HR was a predictor for isolated aura. Diagnostic performance including sensitivity, specificity, and area under receiver operating characteristic (ROC) curve of the predictive model for overall seizures were 77.78%, 60%, 0.696 (95% CI 0.628-0.764), respectively.

Conclusion: Multimodal extracerebral biosignals (HR, ACC, EDA) detected by a wrist-worn smartwatch can help differentiate between epileptic seizures and normal physical activities. It is worth particularly for focal seizures implementing our predictive algorithms in the seizure detection devices and being used in real life. However, larger studies to external validate our predictive models are required.

The Application of Machine Learning in Clustering Borderline Mild Cognitive Impairment among Thai Aging Population

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Abstract

Introduction: MCI distinguishes four clinical subtypes based on memory involvement and number of domain(s) involved. However, detail information of multiple domains is lacking and the controversy of possible undiscovered subtypes is on-going. Unsupervised clustering can reveal subgroups within heterogeneous data that might be difficult to recognize.

Objectives: To determine clusters of aging Thai individuals with borderline mild cognitive impairment (MCI) using unsupervised machine learning based on Montreal Cognitive Assessment (MoCA).

Materials and Methods: Our prospective cohort enrolled healthy Thai adults aged ≥60 years. Cognitive performance was evaluated by the validated Thai version of MoCA. Those with borderline MCI, defined by those who scored between 23 and 27 (cut-off point ± 2), were included in the analysis. Normalized total score of each cognitive domain served as inputs for K-mean cluster algorithm. In addition, data was split into two and clustered independently to examine the consistency of the model.

Results: Among 2799 participants enrolled, 1591 (56.8%) were included in the analysis. Models showed consistency and 6 clusters were demonstrated: 29% had congruous language-memory impairment, 20% had pure memory impairment, 18% had predominant language with memory impairment, 16% had congruous abstraction-memory impairment, 11% had congruous abstraction-language impairment, and 6% had predominant abstraction with language-memory impairment.

Conclusion: Unsupervised machine learning demonstrated six clusters with great consistency surrounding language, abstraction, and memory impairment, mostly with multiple domain, among aging Thai individuals with borderline MCI using data from MoCA. A longitudinal study is ongoing to determine the differences in clinical significances and prognosis between each cluster.

Sampling Frequency of Visual Perception in Parkinson's Disease is Slower Than Normal Aging

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Abstract

Introduction: Visual disturbance, such as visual hallucination, is one of the most disturbing non-motor symptoms in PD. However, the mechanism is still unclear. Since PD have bradykinesia and rigidity as the motor symptoms, we entertained the possibility that visual perception might suffered from similar problem or what we will call "the bradykinesia of the visual system". The previous vision studies have shown that we can measure the "speed" or the sampling frequency of the visual perception by using behavioral paradigm and the peak frequency of posterior dominant rhythm (PDR) from electroencephalography (EEG).

Materials and Methods: 75 PD patients (diagnosed by movement specialists base on MDS-PD criteria) and 35 age-matched controls were recruited. N-flashes discrimination task was used to measure shortest time interval between two flashes (interstimulus interval, ISI) that the participants can reliably discriminate between single flash versus double flashes. The shorter ISI infers faster sampling frequency. The peak of PDR (in Hz) on eye closed was also measured at rest. The ISI, reaction time, and peak of PDR in PD and controls were compared.

Results: ISI in PD patients tended to be longer than controls (mean= 21.4 ms, SE=3.1 versus mean=13.6, SE=1.4 respectively, $p=0.05$). The reaction time in PD patients was significantly slower than controls (mean=503.3 ms, SE=106.4 versus mean=173.0 ms, SE=16.6 respectively, $P<0.05$). Peak of PDR in PD patients made less than controls (mean= 8.51, SE=0.16 versus mean = 9.76, SE=0.18 respectively, $p< 0.001$). Lastly, there were a significant negative correlation between ISI and peak of PDR (Pearson's r = -0.47, $p<0.001$)

Conclusion: We found evidence supported our hypothesis that PD patients had slower visual sampling frequency which can be behaviorally and neurophysiologically measured. This slower visual sampling frequency that might lead to poorer visual perception which underlie visual hallucination.

Volume of Core Infarction by Perfusion CT Automated Software RAPID in Predicting Hemorrhagic Transformation after Intravenous Thrombolysis in Acute Ischemic Stroke Patients at King Chulalongkorn Memorial Hospital

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Abstract

Objective Hemorrhagic transformation (HT) of acute ischemic stroke is an important complication after intravenous thrombolytic therapy, resulting in neurological deterioration with increased mortality and poor clinical outcome. We aimed to determine value of the volume of core infarction by perfusion CT automated software RAPID in predicting hemorrhagic transformation after intravenous thrombolysis in acute ischemic stroke patients within 7 days after intravenous thrombolytic therapy.

Materials and Methods This single-center retrospective, analytic study included patients with acute ischemic stroke who received intravenous thrombolytic therapy and were admitted at the comprehensive stroke unit, King Chulalongkorn Memorial Hospital between January 2018 and June 2020. Demographic data, clinical, laboratory and imaging data were collected. Follow up CT brain was performed within 24-36 hours after intravenous thrombolysis to detect hemorrhagic transformation.

Results 173 acute ischemic stroke patients were included in this study. Hemorrhagic transformation (HT) was observed in 33 patients (19.07%). There were 8(4.6%), 7(4.0%), 12(6.9%) and 6(3.5%) patients with HI1, HI2, PH1 and PH2 respectively. There were 28(16.2%) patients with asymptomatic ICH and 5(2.9%) patients with symptomatic ICH. Atrial fibrillation (OR,4.470; $P < 0.001$), cardioembolic stroke subtype (OR,5.195; $P < 0.001$), NIHSS score at admission, 24hours and within 7 days ($P<0.001$) and ASPECT score ($P< 0.001$) were significantly associated with HT. There was significant difference in mean total volume of infarct core among patients with and without HT (P value=0.004). ROC analysis of infarct core volume showed area under the curve (AUC) of 0.787, with a cutoff point of 3.5 ml and sensitivity 75.8% and specificity 82.1% for prediction of HT.

Conclusion In this study suggest that volume of core infarction by perfusion CT automated software RAPID can predict hemorrhagic transformation core but cannot predict the symptomatic ICH.

Mysterious Epileptic Auras Discovered by Wearable Smartwatch

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Abstract

Objectives: To describe extracerebral biosignal characteristics of epileptic auras (EAs) as compared with baseline normal physical activities using multimodal wearable smartwatch (Empatica E4); 2) to develop a predictive model for EA occurrence; and 3) to assess diagnostic performance of the developed model.

Materials and Methods: We prospectively recruited patients with focal epilepsy who were admitted in epilepsy monitoring unit for presurgical evaluation during January to December 2020. All were simultaneously applied a gold standard long-term video-electroencephalography monitoring and an index test E4. Studied patients were patients with isolated EAs recorded. The remaining patients were included as controls to collect baseline biosignal data. Two certified epileptologists independently determined whether captured events were EAs and then indicated EEG information. Both were blind to multimodal biosignal findings detected by E4. Biosignals during 5-minute epochs of both EA events and baseline were collected and compared. A predictive model for occurrence of EAs was developed using a generalized estimating equation. Diagnostic performance of the model was then assessed.

Results: We included 7 patients with isolated EAs as studied patients and 30 patients as controls. Eighteen EA events and 120 baseline epochs were collected. Heart rate (HR) and electrodermal activity (EDA) but neither acceleration (ACC) nor temperature (TEMP) were significantly elevated during EAs. However, only HR was included in the final predictive model for prediction of EA occurrence. The algorithm was $y = -7.838 + 0.069(HR) + 0.017$ with a cut-point y value $= -1.67$. Diagnostic performance of the developed model was reasonably well particularly its specificity (90%) with area under ROC curve of 0.795 (95% CI 0.673-0.917).

Conclusions: Biosignal changes (HR and EDA) during EAs detected by wearable smartwatch is a promising data to be used in conjunction with clinical information to diagnose EAs. It is worth integrating our predictive algorithm which included only HR for EA occurrence in commercial smartwatches to externally validate its performance.