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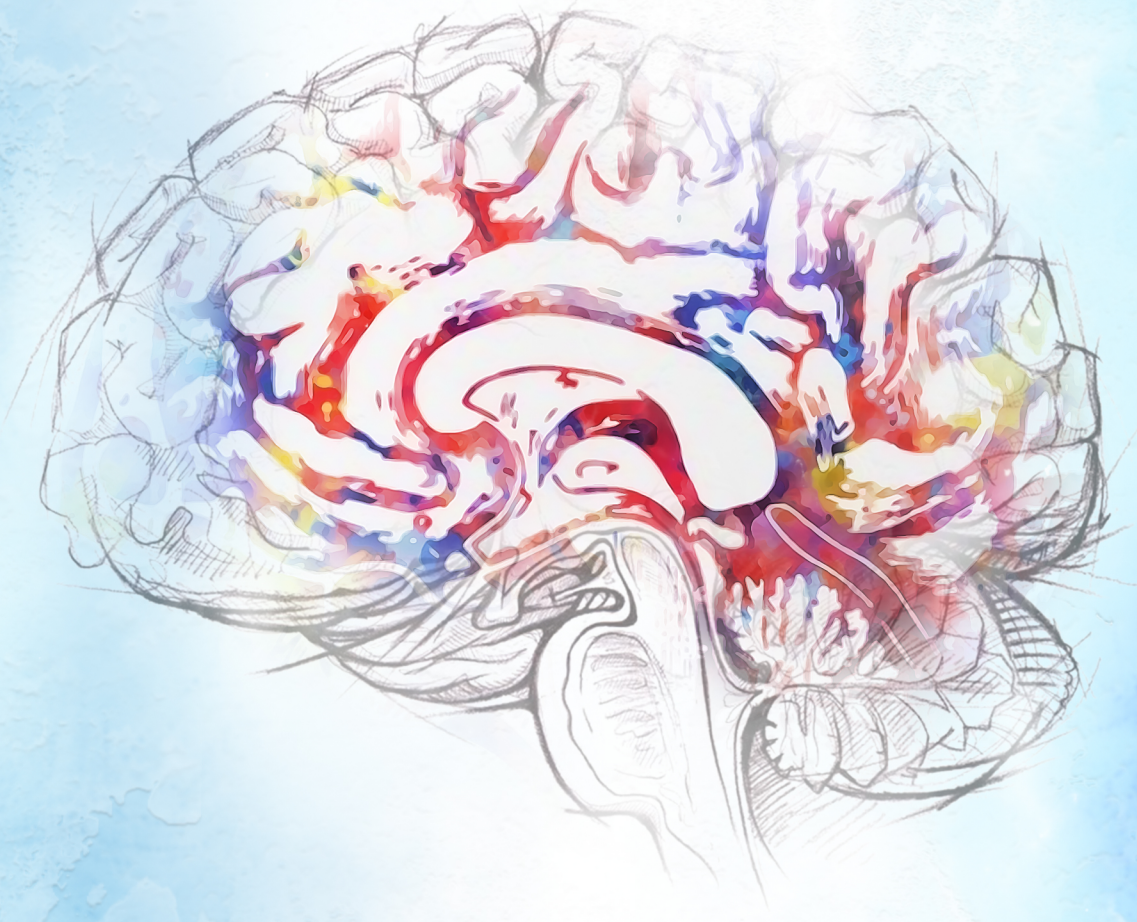

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Table of Content

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MSC VIRTUAL E-ABSTRACT (CPP) - 01
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STROKE AND TOCOTRIENOLS UNIQUE ROLE IN NEUROPROTECTION (SATURN): PROTOCOL

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ABSTRACT

Introduction: Stroke is a major health problem and the second leading cause of death worldwide. In Malaysia, it is the third largest cause of morbidity and mortality. To date, there is no clinically proven neuroprotective agent that can be used prophylactically to minimize the brain cells damage during a stroke nor is there any agent that can ameliorate or hasten the recovery after its attack. Tocotrienols have been reported to exert neuroprotective properties both in cell-based and animal studies. The neuroprotective properties were also demonstrated at the concentration or doses that are achievable in normal supplementation with tocotrienols in humans. Based on these encouraging results, we postulate that mixed tocotrienols from palm oil may indeed be beneficial in helping to improve neurological deficits in patients who have suffered a stroke attack.

Method: Treatment group given tocotrienols while the control group given placebo for 24 weeks with follow up every 12 weeks. Evaluation of study endpoints will be performed at week 24 (end of treatment phase). A safety follow-up visit will be performed up to 14 days after last study treatment administration.

Results: Efficacy parameter will be measured with assessment tools, ie. MRS, NIHSS, MBI, CLOX and TMT Parts A & B. The analyses will be performed using IBM SPSS Statistics. Descriptive statistics will be utilized for selected variables. All probability values will be used two-sided p-value < 0.05 will be considered as statistically significant.

Conclusion: We hypothesized that tocotrienols will reduce neurological deficit and improve functional outcomes after acute ischemic stroke.

AGE ON PREVALENCE OF EPIDEMIOLOGICAL FACTORS, STROKE SUBTYPES AND STROKE EVENTS: AN OBSERVATIONAL STUDY

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ABSTRACT

Introduction: Stroke had been known as a disease of aging but trends were found towards rising stroke incidence at younger age which bring great public health impact as stroke in younger patients carry the potential for greater lifetime burden of disability. Specific definition of young stroke is lacking, the vast majority of authors consider "young stroke" to pertain to individuals under 45 years of age. Age remains as an important non-modifiable risk factor and may be accompanied by multiple comorbidities, particularly for the elderly-aged population which makes worse the prognosis.

Method: We explored 1373 patient data retrieved from the National Neurology Registry (NNeuR) of Seberang Jaya Hospital (HSJ) between January 2013 and December 2018. Data on patient demographics and stroke manifestations were analysed using descriptive analysis.

Results: Mean age of gender on stroke admission had reduced to below 60 years old in male patients, while increased to around 70 years old in female patients on last few years. Mean age of ethnic group on stroke admission was rather plateau over the years. Smoking had been the leading risk factor for stroke admission below 60 years old since year 2016. Mean age of haemorrhagic stroke fluctuated over the years, while mean age of ischaemic stroke and transient ischaemic attack showed rather plateau throughout the years. Mean age for first-ever and recurrent stroke had also been reducing to involve young-aged population over the last few years, with youngest age at presentation of both type of stroke event lowest on year 2018.

Conclusion: Trends towards younger-aged population was noted. More studies on young stroke are needed to understand and reduce their health impact and burden.

INTRAVENOUS THROMBOLYSIS IN OLDER PATIENTS WITH ACUTE ISCHAEMIC STROKE. IS IT SAFE IN OLDER PATIENTS IN MALAYSIA?

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ABSTRACT

Background: Age is still a barrier to the administration of intravenous thrombolysis (IVT) in acute ischaemic stroke, despite emerging evidence on its effectiveness and safety in older patients. This study aims to look at the safety and functional outcome between young and older patients.

Methods: Data were extracted from Malaysia National Stroke Registry particularly looking at patients who were admitted to Seberang Jaya Hospital and Taiping Hospital for acute ischaemic stroke and given intravenous thrombolysis from 2012 to September 2019. Safety measures were all intracranial haemorrhage and symptomatic intracranial haemorrhage. Effectiveness and outcome measurements were improvement in NIHSS, modified Rankin Scale at 3 months, and mortality.

Results: Out of a total of 61 patients who were given IVT, 16 (26.2%) aged 65 or above. The mean age was 56.7(SD=12.6). Only 1 octogenarian was included. There was a statistically significant difference in the median NIHSS on admission between older and younger patients which were 15 and 11 respectively (p value=0.003). The older patient was associated with a statistically significant higher rate of intracranial haemorrhage (56.3% versus 8.9%,p value<0.001); but not symptomatic intracranial haemorrhage (18.8% versus 4.4%, p value=0.108); There was no difference in mortality rate (p value=0.131), 3-month disability (p value=0.07), NIHSS improvement post IVT(p value=0.207) between the two groups.

Conclusion: Apart from intracranial haemorrhage, the older age group was not associated with a higher rate of symptomatic intracranial bleed, mortality, or worse functional outcome. A larger sample study is required to determine whether the older age group is an independent risk factor of poorer outcomes after IVT.

INTRAVENOUS AND INTRA-ARTERIAL THROMBOLYSIS FOR AIS WITH WAKE-UP STROKE – A CASE REPORT FROM SARAWAK GENERAL HOSPITAL

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ABSTRACT

Introduction: Intravenous Thrombolysis (IVT) remains as the main treatment of choice for patients with acute ischaemic stroke patient in resource limited setting. Patient with unwitnessed symptom onset is previously excluded from intravenous thrombolysis. Recent evidence(2,3) proved that MRI and perfusion scan can be used to extend the thrombolysis window. We report a case of acute stroke of unknown onset being treated based on MR perfusion scan.

Case Presentation: A 45 years old gentleman previously healthy, active smoker of 5 pack years, found to have right-sided body weakness upon waking up. He was last seen well 12 hours prior to admission. Upon presentation, he was aphasic with dense right hemiparesis with power 0/5 and left gaze preference, NIHSS was 20. Capillary blood glucose was 4.2, blood pressure of 131/72, ECG was normal sinus rhythm with a heart rate of 70. CT Brain showed left basal ganglia hypodensity. MRI Brain with MR Perfusion showed acute left basal ganglia infarction. The estimated infarcted core is 12cm3 while there is 46cm3 penumbra on MR perfusion.

He was given intravenous Alteplase 0.6mg/kg and planned for intraarterial thrombolysis as rescue. Initial cerebral angiogram showed occluded Left ICA which recanalised with Intra-arterial thrombolysis. However left lenticulostriate artery remain occluded. Repeated scan at 24 hours showed small hyperdensity at the left basal ganglia region, likely represent mild bleed. His condition improved after thrombolysis with NIHSS improved to 9 on day 11 of stroke. At 3 months follow up, his NIHSS improved to 3. After 1 year, he has recovered fully from stroke.

Conclusion: Acute Ischemic stroke causes significant mortality and morbidity. MR perfusion extend the thrombolysis window beyond 4.5 hours of symptom onset and it could be incorporated into acute thrombolysis workflow for patient presenting beyond 4.5 hours.

THROMBOLYSIS IN HYPERACUTE STROKE BY PHYSICIANS IN RESOURCE-LIMITED SETTINGS: THE ESTABLISHMENT OF SERVICE AND CLINICAL OUTCOME APPRAISAL

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ABSTRACT

Introduction: Intravenous thrombolysis with recombinant tissue plasminogen activator (rt-PA) is a well-established therapy/intervention in hyperacute ischaemic stroke. We describe the establishment of this service in Tawau and Bintulu Hospital, two resource-limited acute stroke ready hospitals without in-house neurologist, while evaluating the patients' clinical outcomes following rt-PA therapy.

Methods: Evidence-based Acute Stroke Protocol were drafted under the guidance of respective state neurologists. Acute Stroke Teams, headed by dedicated physicians, were formed to enforce the service implementation and delivery. Patients' clinical data was recorded contemporaneously during admissions and follow-up appointments. Secondary data collection was performed through retrospective review of medical records.

Results: Twenty-nine Asian adults, namely 19 (65.5%) males and 10 (34.5%) females with a mean age of 56.9 (SD 12.2; range 34-77) years, received IV rt-PA therapy from January 2018 to March 2020.
Upon presentation, their median NIHSS was 12 (IQR: 10-19) and median ASPECTS was 9 (IQR: 8.5-10). Median time from stroke onset to rt-PA was 210 (IQR: 180-235) minutes while median door-to-needle time was 75 (IQR 50-115) minutes. Their median NIHSS at 24 hours, 72 hours, and on day 7 post-rt-PA were 7 (IQR: 3-12), 7 (IQR: 1.5-12), and 6 (IQR: 1.5-11) respectively. Such improvements were clinically and statistically significant upon comparison with their pre-rt-PA NIHSS with $p<0.001$ respectively. Notably, nineteen (65.5%) patients achieved mRS≤1 within 90 days post-rt-PA. Three (10.3%) patients developed non-fatal intracranial haemorrhages while two (6.9%) patients succumbed to non-haemorrhagic extracranial causes, all within 90 days post-rt-PA.

Conclusion: Despite challenges/limitations in logistics, healthcare facilities, human and financial resources, and the lack of in-house neurologist, it is still possible, provided with concerted efforts to work within the confines of these limitations and strict adherence to evidence-based protocol, to provide a beneficial intravenous thrombolysis service for stroke patients safely and fairly efficiently, even in non-stroke centres.

OUTCOME OF ISCHEMIC STROKE THROMBOLYSIS TREATMENT IN SEBERANG JAYA HOSPITAL, A SINGLE CENTER 8 YEARS REVIEW: 2012- 2019

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ABSTRACT

Introduction: Ischemic stroke is a neuromedical emergency. Systemic thrombolysis with recombinant tissue plasminogen activator (rtPA) is an effective therapeutic option in the treatment of acute ischemic stroke.

Objective/Purpose: To study the treatment outcome of ischemic stroke patients who had received intravenous thrombolysis at Seberang Jaya Hospital.

Methods: This is a retrospective cross sectional study of acute ischemic stroke patients who had received IV-rTPA (IVT) at Seberang Jaya Hospital from year 2012 to 2019. Data was extracted from the medical record of study subjects. The analysis is part of the National Stroke Registry.

Results: A total of 49 patients with ischemic stroke had received systemic thrombolysis with IVT from year 2012 to 2019. The mean (SD) NIHSS upon admission was 13 (5). 47% were PACI, 26.5% were LACI, and 26.5% were TACI. Four patients (8.2%) received mechanical thrombectomy. Four patients (8.2%) required decompressive craniectomy. Eight patients (16.3%) had intracranial bleeding (ICB) post IVT. Six patients(12.2%) died in the same admission, and four patients (8.2%) died within three months post discharge. MRS score at three months were: MRS 0 (5 [10.2%]); MRS 1 (9 [18.4%]); MRS 2 (7 [14.3%]); MRS 3 (6 [12.2%]); MRS 4 (10 [20.4%]); MRS 5 (2 [4.1%]); and MRS 6 (10 [20.4%]).

Conclusion: Compared to the ECASS III trial, there were fewer patients with favourable outcome at three months (MRS score of 0 or 1) (28.6% vs 52.4%), but the ICB complication rate was lower (16.3% vs 27%) among acute ischemic stroke patients who had received IVT at our center.

ACKNOWLEDGEMENT

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RETROSPECTIVE COMPARISON OF HYPERACUTE MRI BRAIN VS. CT BRAIN IN ACUTE ISCHEMIC STROKE : AN OBSERVATIONAL STUDY IN A DISTRICT HOSPITAL

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ABSTRACT

Introduction: Immediate accessed to brain imaging is important in managing hyperacute stroke. Most center in our country utilizes CT brain during the code stroke. We take the opportunity to study the hyperacute stroke MRI (hMRI) sequence from 1st of October to 31st of December 2019 during the CT service upgrading process. We aim to compare the hMRI vs CT timing during office-hour in stroke thrombolysis cases in 2019.

Objective/Purpose: To determine door-to-needle and stroke outcome for hMRI vs CT during office-hour.

Methods: A retrospective study done in Seberang Jaya Hospital from 1st October 2019 to 31st December 2019. Patients who received IVT within office-hour in year 2019 were recruited. The hMRI sequence consisted of Localizer, DWI/ADC, T2 flair, and T2 GRE.

Results: The hMRI(n=4) door to imaging median was 80.0 (IQR : 45.0) minutes vs. Door-to-CT time (n=8) median of 25.0 (IQR: 29.75) minutes (p value=0.073). The door to needle time (DNT) for hMRI median was 105.0 (IQR : 51.0) minutes and the DNT for CT subgroup median was 75.0 (IQR: 36.5) minutes (p value =0.461).

Conclusion: The hMRI is more time consuming but it can be an alternative brain imaging for hyperacute stroke patients in the event of non- availability of CT services.

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CORTICOSPINAL TRACT (CST) STRUCTURAL INTEGRITY AS THE IMAGING MARKER OF FUNCTIONAL MOTOR RECOVERY OUTCOME IN STROKE REHABILITATION

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ABSTRACT

Background: Diffusion tensor imaging (DTI) studies offer an objective assessment of the structural integrity involving the ipsilesional and contralesional corticospinal tract (CST). Such an assessment is recognised to help to inform the rehabilitation progress in stroke recovery. Fugl-Meyer Assessment- Upper Extremities (FMA-UE) is the most common functional motor outcome used to assess the progress of motor recovery of the upper limbs in post-stroke events.

Objective: We investigated both ipsilesional and contralesional CSTs structural integrity (FA-CST) and compared their correlation with functional motor outcome (FMA-UE) in a group of post-stroke rehabilitation patients.

Methods: A group of 18 stroke survivors (who met the inclusion and exclusion criteria) were consented and recruited to undergo the FMA-UE and Magnetic Resonance Imaging (MRI)-DTI.

Results: There was a statistically significant and strong positive correlation of ipsilesional FA-CST value with FMA-UE score (r=0.786, p<0.001). For FA value in the contralesional CST, a significant and moderate positive correlation was found with FMA-UE score (r=0.518, p=0.036).

Conclusion: These findings suggest 2 different site of FA measurements, ipsilesional and contralesional CSTs can inform reliably the structural integrity of CST and these imaging markers can potentially be used clinically to correlate with the functional motor activity outcomes in stroke rehabilitation.

A SYSTEMATIC REVIEW AND META-ANALYSIS: THE EFFECTS OF VEGETARIAN DIETS ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE

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ABSTRACT

Introduction: The effects of vegetarian diets on systolic and diastolic blood pressure (BP) have been reported in previous systematic reviews; nevertheless, the relative effectiveness is not well known.

Method: We performed a systematic review and meta-analysis to determine the effect of a vegetarian diet on the reduction of systolic and diastolic BP. We only included randomized controlled trials (RCT) and searched through Medline, PubMed and Cochrane Central Register. We analysed 15 eligible RCTs with a total of 856 subjects.

Results: Vegan diet showed more reduction in systolic BP (WMD, −3.12 mm Hg; 95% CI = −4.54, −1.70, $p < 0.001$) as compared with a lacto-ovo-vegetarian diet (WMD, −1.75 mm Hg, 95% CI −5.38, 1.88, $p = 0.05$). The vegan diet has also demonstrated greater reduction of diastolic BP (WMD, −1.92 mm Hg; 95% CI = −3.18, −0.66, $p < 0.001$) as compared with a lacto-ovo-vegetarian diet which showed no changes in diastolic BP reduction (WMD, 0.00 mm Hg, 95% CI = 0.00, 0.00, $p = 0.432$). A pooled result of all types of vegetarian diets showed a significantly lowering effect on the systolic BP (WMD, −2.66 mmHg; 95% CI = −3.76, −1.55, $p < 0.001$) and diastolic BP (WMD, −1.69 mm Hg; 95% CI = −2.97, −0.41, $p < 0.001$) as compared to an omnivorous diet.

Conclusion: Vegan diets are associated with significant reductions in BP compared with lacto-ovo-vegetarian diet and omnivorous diets. These suggest that vegan diet is more superior than other diets as mentioned in the study to aid in the primary prevention and overall management of hypertension.

ASSOCIATION OF STROKE SEVERITY AND RISK FACTORS WITH THE LOCAL ETHNIC COMMUNITY OF SEBERANG PRAI - 4 MONTHS REVIEW FROM ACUTE STROKE UNIT, SEBERANG JAYA HOSPITAL

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ABSTRACT

Introduction: The population of Seberang Perai District in Penang is estimated to be 1.1 million in 2020, and consists of the following ethnic groups: Malays (50.3%), Chinese (38.9%), Indians (10.4%), and others (0.4%) .

Objective: To study the stroke type and risk factors among patients of different ethnicities, who were admitted to Seberang Jaya Hospital due to stroke.

Method: This is a retrospective cross-sectional study of all patients who were admitted to the acute stroke unit of Seberang Jaya Hospital from 11th November 2019 to 29th February 2020.

Results: Of 92 patients who were hospitalized for stroke during the 4-month period, 48.9% were Malays, followed by Chinese (37.0%), and Indians (14.1%).
Associated risk factors among Malay patients were hypertension (73.3%), diabetes mellitus (53.3%), history of stroke (15.5%) and cigarette smoking (11.1%). None had atrial fibrillation. Lacunar circulation infarcts (LACI)[62.2%] was the commonest, followed by partial anterior circulation infarcts (PACI)[20.0%], total anterior circulation infarcts (TACI)[2.3%], and posterior circulation infarcts (POCI)[4.4%]. Transient ischemic attacks (TIA) accounted for 11.1% in this group. Similar risk factors were observed among the Chinese. Hypertension (76.4%) topped the list, followed by diabetes mellitus (44.1%), history of stroke (14.7%) and cigarette smoking (11.7%). None had atrial fibrillation. The majority had LACI (64.7%), 2.9% had PACI, 5.9% had TACI, 5.9% had POCI, 17.6% had TIA and 3.0% had intracranial bleed. Indians too shared similar risk factors: Hypertension (76.9%), diabetes mellitus (46.1%), history of stroke (15.3%) and cigarette smoking (7.6%). None had atrial fibrillation as well. The majority (69.2%) had LACI, 7.6% had TACI, and 23.2% had TIA.

Conclusion: Among stroke patients who were admitted to the acute stroke unit of Seberang Jaya Hospital, LACI was the commonest stroke type. The most prevalent risk factors were hypertension and diabetes mellitus.

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ANGIOEDEMA SECONDARY TO IV ALTEPLASE FOR ACUTE ISCHEMIC STROKE

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ABSTRACT

Introduction: Orolingual angioedema is a rare complication of alteplase which is frequently used for stroke thrombolysis. Its incidence is estimated at 0.2-5.1%. This was our first encounter of orolingual angioedema out of 113 thrombolysed patients since January 2014 till May 2020.

Methods: We report a case of orolingual angioedema in a patient who was thrombolysed with IV alteplase.

Results: A 62 years old man with underlying hypertension, DM, recurrent TIA episodes 10 years ago, NSTEMI 2 years ago, presented with acute left upper & lower limb weakness and left hemifacial numbness. He has left facial palsy, right gaze preference, complete left hemianopia and neglect, aphasia, dysarthria, upper and lower limb power 1/5. NIHSS score was 20. CT brain revealed slight loss of grey white matter differentiation at right middle cerebral artery territory. ASPECT score is 8/10. He was on oral perindopril 4mg daily for hypertension. He developed swelling at base of tongue, lower lips swelling and stridor 5 minutes after completion IVI alteplase. IV methylprednisolone 125mg, IV adrenaline 0.1mg, IV pantoprazole 40mg and IV chlorpheramine 10mg was immediately administered. His condition was alerted to our anesthesiology & ENT teams. Fortunately, his oxygen saturation was maintained with 15L oxygen. He did not develop worsening respiratory distress. The angioedema resolved spontaneously after 48 hours. His remaining stay was uneventful & was discharged after 15 days stay in hospital.

Conclusion: Orolingual angioedema is a rare life threatening emergency requiring immediate attention and prompt treatment. Physicians need to be alert about ACEi that are common in medication prescriptions.

YOUNG STROKE WITH ANTIPHOSPHOLIPID SYNDROME AND NEPHROTIC SYNDROME

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ABSTRACT

Introduction: Acute ischemic stroke in young adults is uncommon as compared to the elderly. It accounts approximately 10% of all stroke cases. Physical limitations caused by stroke in young adults lead to huge economic loss to patients and their families. However, these groups of patients have longer life expectancy at post-stroke, which in turn pose a heavy burden to the healthcare system. Studies have illustrated that they have better long term prognosis with better functional recovery, with some returning to work.

Method: This is a case report of a young man with ischemic stroke and the workup for young ischemic stroke.

Case Report: We report a case of a 21-year-old man with underlying nephrotic syndrome secondary to minimal change disease who developed an ischemic stroke causing left hemiparesis. He received intravenous thrombolysis followed by a mechanical thrombectomy. Magnetic Resonance Angiography of the brain showed stenosis at distal M1 segment of right middle cerebral artery. At post mechanical thrombectomy, he developed acute kidney injury and required haemodialysis. Further workup revealed that he had concomitant antiphospholipid syndrome(APS) and nephrotic syndrome, and he was started on Vitamin K antagonist anticoagulant.

Conclusion:

a. Young patients with thrombotic events require extensive workup to look forunderlying causes of thromboembolism.
b. Patients with antiphospholipid syndrome may have APS nephropathymanifestation, and this could lead to end stage renal failure. However, the association of APS nephropathy and minimal change disease remains unclear.
c. The use of direct oral anticoagulants in nephrotic syndrome or APS are not proven well. Current recommendation still favors the use of Vitamin K antagonists in these groups.

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MULTIDISCIPLINARY MANAGEMENT OF A HEMORRHAGIC STROKE DURING PREGNANCY WITH A SUCCESSFUL FUNCTIONAL OUTCOME

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ABSTRACT

Introduction: Stroke is debilitating and affects 30 out of 100,000 pregnancies. This is a case report describing the multidisciplinary medical management as well as rehabilitation and its importance in a middle-aged female who sustained a hemorrhagic stroke during her second trimester of pregnancy.

Methods: A 32-year-old female at 16 weeks gestation with nil past medical history presented to an acute hospital with sudden left-sided weakness and slurred speech secondary to a right fronto-parietal hematoma and a right parietal arteriovenous malformation (AVM). She underwent urgent right decompression craniectomy and evacuation of the frontoparietal clot. One month later, she underwent excision of right opercular region AVM with no residual AVM identified on post-surgical radiological imaging.

Results: She received inpatient rehabilitation shortly after her decompressive craniectomy and continued to do so after her AVM excision. Her activities of daily living (ADLs) and ambulatory ability improved after 9 weeks of inpatient rehabilitation.
With multidisciplinary management by the obstetrician, neurosurgeon, and anesthetist, she underwent a caesarean section at 37 weeks gestation with general anesthesia uneventfully and successfully delivered a healthy baby boy. At 9 months post-stroke, she underwent cranioplasty uneventfully. She continued with her outpatient rehabilitation. At 10 months post-stroke, she was reviewed in the Rehabilitation Medicine clinic and she was independent with her ADLs but required assistance to physically care for her baby. Over the two years post-stroke, she received 2 courses of botulinum toxin injection to her spastic left-sided upper limb and outpatient rehabilitation. Two years after her stroke, she could physically care for her child fully and could perform household chores.

Conclusion: Stroke during pregnancy is usually associated with high mortality and morbidity. Multidisciplinary medical management in addition to rehabilitation are essential for the favorable prognosis of both mother and child.

THE LIGHT AT THE END OF TUNNEL FOR MANAGEMENT OF ACUTE ISCHEMIC STROKE WITH LARGE VESSEL OCCLUSION IN NON-NEUROLOGIST HOSPITAL

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ABSTRACT

Introduction: The advances in stroke reperfusion therapies in large vessel occlusions (LVO) of acute ischemic stroke (AIS) have known to improve the functional outcome of patient despite being treated in non-neurologist hospital.

Case report: A 38 years old male with hypertension and hyperlipidemia, presented to non-neurologist hospital with sudden onset of right sided hemiparesis and neglect together with global aphasia. His initial National Institutes of Health Stroke Scale (NIHSS) was 22. Non-contrasted Computed tomography (CT) brain showed left corona radiata infarction. After discussion with neurologist from the hub of stroke team, he was given intravenous Alteplase at 2 hours and 15 minutes from the onset of symptoms. 2 hours post thrombolytic therapy, his NIHSS remained at 22 and a CT angiography of brain showed significant stenosis of more than 75% at the left middle cerebral artery (MCA) M1 segment. He was then referred to private hospital for mechanical thrombectomy with financial support from his employer, Malaysian Armed Forces. However, thrombectomy was not performed as CT angiography of brain repeated at 8 hours post Alteplase showed recanalysed MCA. NIHSS at 2 weeks post intravenous thrombolysis and in-patient intensive rehabilitation was 16 with improvement in right hemiparesis and residual expressive dysphasia. His modified Rankin Scale (mRS) was 4 on discharge. An outpatient review 3 months post thrombolysis showed significant reduction of NIHSS to 5 and mRS improved to 2. He is now able to walk independently and speak comprehensibly.

Discussion and Conclusion: The development of hub-and-spoke model of stroke team between neurologist and acute internal medicine service in non-neurologist hospital as well as collaboration with private hospital for mechanical thrombectomy has become the stepping stone for patients to receive early reperfusion therapies. Early revascularisation of AIS due to LVO and coordinated intensive rehabilitation service would result in good functional outcome for patients.

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ACTIVATION OF STROKE PROTOCOL AND THROMBOLYSIS IN NON CT HOSPITAL

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ABSTRACT

Introduction: Stroke is a medical emergency which is a leading cause of morbidity and mortality nationwide. In order to improve the outcome of stroke patients, Stroke Protocol was initiated in the Emergency Department, Hospital Bukit Mertajam, although without advance imaging facilities. Stroke Protocol was coordinated via activation of yellow and red alert, primary team doctors in Hospital Bukit Mertajam and Hospital Seberang Jaya, escort team and radiology staff in Hospital Seberang Jaya.

Methods: A departmental level study on the effectiveness of Stroke Protocol was conducted from 1st March 2020 - 31st May 2020. This prospective study is to compare the time taken to thrombolyse acute ischemic stroke in 2019 and post implementation of Stroke Protocol in 2020. Duration of time from registration, consultation, CT brain, and thrombolysis therapy were recorded and compared. The inclusion criteria are acute presentation within 4.5 hours of onset and National Institute of Health Stroke Scale Score of 6-25.

Results: The Stroke Protocol implemented from March 2020 till May 2020, had a total number of 25 patients with 2 patients undergoing thrombolysis. The mean time from registration to CT brain was 1 hour 42 minutes. While registration to thrombolysis was 2 hours 16 minutes. In comparison to 2019, mean time from registration to CT brain was 4 hours 36 minutes with no thrombolysis done.

Conclusion: The implementation of Stroke Protocol shortened the arrival time to CT scan and arrival time to thrombolytic therapy, thus reducing morbidity and mortality and increasing the quality of service in Emergency Department.

OUTCOME OF STROKE THROMBOLYSIS IN LACUNAR STROKE AT HSNZ

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ABSTRACT

Objective: To investigate the outcome of stroke thrombolysis in patients diagnosed with lacunar stroke (LACI) in Hospital Sultanah Nur Zahirah.

Introduction: Intravenous thrombolysis has proven to be a beneficial treatment in acute ischemic stroke. Lacunar stroke is associated with an unfavourable long term prognosis with an increased risk of recurrent stroke, cognitive dysfunction and death. The role of thrombolysis in lacunar stroke has been uncertain given the absence of a clear demonstration of thrombosis.

Methods: We analysed the data from the stroke thrombolysis registry of Hospital Sultanah Nur Zahirah, collected from January 2014- January 2020. Diagnosis of LACI was assigned by neurologists using the Oxfordshire Community Stroke Project (OCSP) classification. Patients were categorized according to the National Institute of Health Stroke Scale (NIHSS) severity in mild NIHSS (≤8), moderate NIHSS (9-15) and severe stroke (NIHSS≥16). Patient outcome is defined by the Modified Rankin Score (mRS) at 3-months follow up, where mRS 0-1 = full recovery, mRS 2 = minor disability, mRS 3=moderate disability, mRS 4-5 = major disability, and mRS 6= death.

Results: 94 patients were thrombolysed from January 2014 to January 2020. The frequency of LACI was 27.7% (26/94). Overall, 53.8% had mild and 46.2% had moderate stroke pre thrombolysis. The mean baseline NIHSS score was 7.96, and the mean NIHSS score 24hours post thrombolysis was 4.83. At 24hour, 73% had mild, 19.2% had mod while 7.6% had severe stroke. At 3 months, 19.2% made full recovery, 30.8% had mild disability, 11.5% had moderate disability, 7.6% had major disability; death 15.3%, and 11.5% was lost to follow up.

Conclusion: Patients with lacunar stroke in our study had improvement in NIHSS scores at 24hours and has better outcome at 3 months. Further studies with a larger sample size should be performed to determine the risk versus benefits of thrombolysis in lacunar stroke.

THE USE OF INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) TO IDENTIFY BARRIERS IN REHABILITATING PATIENTS WITH RIGHT HEMISPHERIC STROKE

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ABSTRACT

Background: Stroke is a vascular insult to the brain that results in neurological deficits, which last for more than 24 hours. Patients with right hemispheric stroke present with dense hemiplegia, left sensory neglect, apathy and poor functional outcome. The ICF is a useful conceptual framework that can be used to identify barriers in stroke rehabilitation.

Objective: The aim of this paper is identify barriers in rehabilitating right hemispheric stroke patients using the ICF conceptual framework.

Methods: Three female and four male patients with right middle cerebral infarcts were admitted into the neurorehabilitation ward in Hospital Rehabilitasi Cheras in May 2020. Rehabilitation goals, medical and functional information were categorised into five ICF domains. Outcome measures such as Mini Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), Modified Barthel's Index (MBI), National Institute of Health Stroke Study (NIHSS) and Berg's Balance Scale (BBS) scores were charted on admission and before discharge. Common issues were identified and summarised.

Results: The most common neurological deficits after right cerebral infarcts were left hemiplegia (100, left tactile neglect (100%),%), left visual neglect (71.4%), poor truncal balance (85.7%), severe cognitive deficits (85.7%) and apathy (57.4%). Five out of seven patients were wheelchair dependent and required assistance with their transfers and personal care. Barriers to progress in rehabilitation were cardiovascular issues (57.1%), severe left sensory neglect (100%), severe cognitive deficits (85.7%), poor truncal balance (85.7%), poor social support or family discord (57.1%), MBI scores of 87% or less (71.4%) and frailty (57.1%). All patients could not resume their previous roles in the community despite improvements in their MBI and BBS scores at the end of their rehabilitation program.

Conclusions: The ICF may be a useful tool to guide clinicians in identifying barriers to stroke rehabilitation. Barriers to progress are cardiovascular issues, left sensory neglect, poor balance, severe cognitive deficits, frailty and poor social support.

CEREBRAL VENOUS SINUS THROMBOSIS: CLINICAL FEATURES AND REHABILITATION OUTCOME

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ABSTRACT

Introduction: Cerebral venous sinus thrombosis (CVST) is rare and accounts for <1% of all strokes. In CVST, thrombosis occurs in venous side of the brain circulation, leading to occlusion of one or more cerebral veins and dural venous sinus. Prognosis for functional recovery is favourable with early therapeutic and rehabilitation intervention.

Objective: To report the presenting clinical features of CVST, sequalae and outcome of individuals diagnosed with CVST and referred for neurorehabilitation.

Method: Single-centre of four case-series of CVST cases referred for neurorehabilitation.

Results: **Case 1:** 54 y.o lady presented with right hemiparesis and focal seizures. Diagnosed as superior sagittal sinus thrombosis with bilateral haemorrhagic parietal venous infarct. Developed bilateral paresis and fully dependent. With intensive rehabilitation, achieved full functional status within 6 months.

Case 2: 36 y.o lady presented with headache, vomiting and altered behaviour. History of taking oral contraceptive. Investigation demonstrated internal cerebral vein, inferior sagittal sinus and straight sinus thrombosis causing bilateral basal ganglia, thalamus, corona radiata and corpus callosum infarction. She developed amnesic features with no focal motor impairment. Memory issues gradually resolved and successfully returned to work within 6 months.

Case 3: 42 y.o man presented with significant headache. Diagnosed as left transverse and sigmoid sinus thrombosis with temporal venous infarct. Developed significant memory and attentional cognitive issues, requiring cognitive training. Resultant cognitive sequalae gradually improved at 1-year follow-up.

Case 4: 39 y.o lady presented with headache, altered behaviour and generalized seizures. Diagnosed as sagittal sinus thrombosis with bifrontal haemorrhagic venous infarct with cerebral edema necessitating decompressive hemicraniectomy. She has left hemiparesis, isolated cranial nerve paralysis with impaired executive function and memory. Neurorehabilitation resulted in good outcome and achieved full independence within 3 months.

Conclusion: Clinical features in CVST are variable. Despite extensive brain involvement, favourable recovery is possible with early treatment and neurorehabilitation.

UNLOCKING THE LOCKED-IN SYNDROME (LIS)': INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) AS A CLINICAL TOOL IN FORMULATING REHABILITATION PLANS AND OVERCOMING CHALLENGES IN LIS PATIENTS

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ABSTRACT

Introduction: Locked-In Syndrome (LIS), a disabling medical condition leading to tetraplegia and anarthria in a state of wakefulness commonly due to brainstem stroke. Due to the severity of impairment and complexity of care, individuals with LIS pose tremendous rehabilitation challenges and require interdisciplinary rehabilitation approach.

Method: Case series in a single institution, highlighting the rehabilitation challenges encountered in two LIS patients during inpatient rehabilitation. WHO International Classification of Functioning, Disability and Health (ICF) is a universal framework used to delineate the rehabilitation issues and devise a structured rehabilitation plan.

Case Series: Two LIS patients admitted in neurorehabilitation ward. Mr. AR, 50-year old man developed classical LIS due to bilateral pontine and midbrain infarct secondary to basilar artery thrombosis. Mr. FB, 46-year old man developed incomplete LIS due to brainstem and cerebellar infarction secondary to basilar artery thrombosis.
Based on ICF, both patients had similar impairments in body structure and body function which are tetraplegia (causing immobility), anarthria (communication problem), and dysphagia on enteral feeding. Mr. AR had tracheostomy for secretion management and had upper gastrointestinal bleeding episodes which prolonged his inpatient stay. Both patients had significant activity limitations (severe carer dependent) and participation restriction (role fulfilment as husband, father, employee). Other rehabilitation issues delineated were significant environmental barriers (inadequate home environment and carer burden). Individualized goal-setting and structured rehabilitation planning was performed for both patients using ICF and executed accordingly.

Conclusion: Formulation of goal setting and rehabilitation plans are more effective with the application of WHO-ICF in LIS patients. Personal and environmental factors can be facilitators or barriers, thus play a huge role in the rehabilitation of LIS patients. Interdisciplinary holistic approach (expert medical care, intensive therapy, customized equipment and latest technology) based on ICF is essential in providing best possible outcome and promote better quality of life.

VESTIBULAR MIGRAINE : A CASE REPORT

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ABSTRACT

Introduction: Vestibular migraine is a common medical diagnosis. It is a term used for patients with a past or current history of migraine, presenting with dizziness as the predominant symptom with or without headache. The management for vestibular migraine is not well known or available. However, vestibular rehabilitation therapy (VRT) has been shown to be an effective treatment option.

Methods: Here we report a case that fulfilled the criteria for diagnosis of vestibular migraine based on International Classification of Headache Disorder third edition (ICHD-3) whom benefited from VRT.

A 44-year old lady presented with complaint of persistent dizziness. She had a past history of long standing persistent headache described as unilateral, throbbing in nature and she was treated for migraine without aura. Later on, she was diagnosed with haemorrhagic stroke secondary to left parietal ruptured arteriovenous malformation (AVM) in 2018. The headaches were now associated with dizziness and imbalance. She was treated with betahistine for some time, but she still had continuous dizziness which varied in intensity. Vestibular assessment showed abnormal central vestibular-occular reflex function. Vestibular rehabilitation therapy was started which include gaze stabilization exercise with total of eight therapy sessions.

Results: At the completion of the program, her dizziness and headache have improved with vestibular rehabilitation therapy and concurrent T.betahistine as well as her quality of life.

BURDEN OF STROKE IN HOSPITAL USM, KOTA BHARU, MALAYSIA.

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ABSTRACT

Introduction: Stroke is currently a major cause of disability in the world. The incidence and prevalence of stroke in Kota Bharu, where the ethnicity is mostly Malay and mostly from the underprivileged economy background might showed different set of data from the rest of Malaysia. This data might contribute to better prevention and awareness campaign in this particular area.

Method: Patients admitted to Hospital USM with CT scan finding suggestive of stroke from1 January 2018 to 31 December 2019 were retrospectively enrolled in this study. Descriptive analyses were performed.
Results: 575 patients were admitted to Hospital USM with diagnoses of stroke. Interestingly, out of these patients, 98.4% (n=566) were ischemic stroke patients while only 1.6% (n=9) were haemorrhagic stroke patients. For ischemic stroke data, 58.5% were male patients and 41.5% were female, with the group mean age of 62.8 years. As for haemorrhagic stroke data, 88.8% were female patients and 11.2% were male, with the group mean age of 56.9 years.

Conclusion: The incidence and prevalence of stroke in Hospital USM showed an increasing trend with similar nearly age range with the Acute Stroke Registry Malaysia 2010-2014 data. The high prevalence of ischemic stroke might be a point to ponder and a proper planning to increase the stroke risk factors awareness aiming at reducing the stroke burden in Malaysia is important.

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PROFILING OF FUNCTIONAL AND DISABILITY STATUS IN LOCKED-IN SYNDROME (LIS) PATIENTS USING INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) BRIEF CORE SET FOR STROKE IN HOSPITAL REHABILITASI CHERAS (HRC)

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ABSTRACT

Introduction: Locked-In Syndrome (LIS) is a catastrophic, disabling state with tetraplegia and anarthria commonly due to brainstem stroke. Rehabilitation in LIS is a tremendous challenge due to multiple impairments and disabilities involved. International Classification of Functioning, Disability and Health (ICF) is an internationally accepted framework for describing function, disability and health which can be used to describe multiple impairments and disabilities that are present in LIS.

Method: There are a total of three LIS due to stroke which were referred to HRC for post-stroke rehabilitation between 2018 and May 2020. The diagnoses were confirmed via CT scan. After interdisciplinary team assessment, the patients' functional and disability status were profiled using ICF Brief Core Set for Stroke, which has six items for Body Function component (i.e. functions of consciousness, orientation, attention, memory, muscle power and mental functions of language) and seven items for Activities and Participation component (i.e. communicating with receiving spoken massage, speaking, walking, washing oneself, toileting, dressing and eating). A Likert scale of 0 to 5 was used to determine the severity of the problem for each item (0 = no problem, 1= very mild, 2= mild, 3= moderate, 4=severe, 5= complete problem).

A score of 3 and above was considered significant for an item that a patient has problem with. All patients have significant impairment in muscle power (for Body Function component). It is in speaking, walking, washing oneself, toileting, dressing and eating (for Activities and Participation component). Score in other items are not significant.

Conclusion: The ICF Brief Core Set for Stroke can be used to describe functional problems and impairments to guide a holistic, interdisciplinary rehabilitation approach in managing LIS.

LONG TERM CARE JOURNEY OF STROKE SURVIVORS WITH MILD IMPAIRMENT LIVING IN THE COMMUNITY : A MIXED METHOD RESEARCH

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ABSTRACT

Introduction: Lack of continuity of care and disparity in access to services is still a problem in long term stroke care. The aim of the study is to describe the journey of care from the perspective of stroke survivors living in the community.

Methods: This study was a mixed method research that analysed integrated data from quantitative measurement, an audit of the participant's medical records with quantising data from semi structured interview of each participant. Enrolled participants were stroke survivors admitted to a tertiary medical centre with the clinical diagnosis of acute stroke or transient ischaemic attack (TIA) in Jan 2016-Jan 2017. Participant were local resident, aged at least 18 years old, spoke Malay or English with low disability Modified Rankin Scale equal or less than 4. Participants who were affected by stroke secondary from other medical comorbidities and have cognitive impairment were excluded. Potential participants were screened from emergency department's attendees. This study obtained approval from the relevant medical ethic committees.

Results: There were 89 participants consented to the study. The mean age of participants were 64 years old (SD 12). The study found 93.3% of the stroke survivors attended follow up post discharge but the number dropped to 83.1% after the second year. At present, only 38% of these participants have regular primary care follow up whilst 45% have at least 1 to 3 follow up in the past year with the neurology clinic. Lack of communication in terms of risk education is also a problem with discrepancies between reported compared to recorded information on education and counselling in stroke education (37% vs 60%) , stroke risk education (35% vs 72%), diet education (47.2% vs 42.7%) and medication education (69% vs 54%).

Conclusion: The transition of care from neurology clinic to long term care in the community is fragmented with less than 40% of stroke survivors accessing services provided by the primary care. There was missed opportunity in delivering risk and preventive education to reduce the risk of recurrent stroke and cardiovascular events.

HEMIPLEGIC MIGRAINE, A RARE STROKE MIMIC: A CASE REPORT

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ABSTRACT

Introduction: Hemiparesis is the commonest acute stroke presentation. However, not all hemiparesis is stroke. Stroke mimics account up to 30% of initial stroke presentation, of which approximately 1% is hemiplegic migraine.

Case report: A 33 year old female with childhood bronchial asthma and no vascular risk factors presented with right sided hemiparesis and right upper motor neuron facial palsy. Her initial upper and lower limb power was 4/5. NIHSS 4. This started insidiously 1 week prior to presentation and was preceded by severe left sided headache, with nausea, vomiting, foggy vision, photophobia and phonophobia. She experienced similar headaches for 3 months, in episodic manner but was not associated with any aura. Computed tomography (CT) of the brain showed ill-defined hypodensity at temporal region. Subsequent magnetic resonance imaging (MRI) done on the same day was normal. During the second day of admission, her power was 5/5 with residual right facial palsy. She was started on NSAIDS and Flunarizine. Headache started to subside and she was discharged home well with an appointment to review her symptoms.

Conclusion: Absence of vascular risk factors in a young person should trigger a clinician to look hard for alternate diagnosis to stroke. Although rare, timely diagnosis and treatment is important as hemiplegic migraine is a debilitating illness that negatively impacts on quality of life.

MORE THAN JUST SLEEPINESS': A CASE REPORT ON SIGNIFICANT HYPERSOMNOLENCE AS A 'NOT-TO-MISS' SIGN OF TOP OF BASILAR SYNDROME

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ABSTRACT

Introduction: Sleep-disordered breathing (SDB) is common post stroke which includes Obstructive Sleep Apnoea (OSA) or Central Sleep Apnoea (CSA). Top of the Basilar Syndrome (TOBS), is a rare subtype of posterior circulation stroke (POCS) which manifest as abnormalities of alertness, hypersomnolence, with abnormal oculomotor functions.

Method: A case report of a patient with evolving posterior circulation infarct who demonstrated worsening hypersomnolence correlating with clinical features of TOBS.

Case Report: Mr. FAB, 48-year-old gentleman, presented with dizziness and right hemiparesis with full GCS, left eye ptosis with ophthalmoplegia correlating with Weber Syndrome. CT brain shows multifocal infarcts at left subcortical region, left thalamus and left cerebral peduncle. Day 7 post stroke, he developed right eye nystagmus with CT brain showed basilar artery dense sign, suggestive of acute basilar artery thrombosis. He was then referred for intensive stroke rehabilitation. Day 21 post stroke, he developed new left hemiparesis, aphasia and dysphagia with interrupted sleep and excessive daytime sleepiness. However, repeated CT brain did not show significant progression. STOPBANG score was 4 (high risk of OSA). Within that week he had deterioration in function with regression in outcome measures. On Day 27 post initial stroke, patient had worsening hypersomnolence, grunting and altered consciousness. GCS dropped to E4V1M5 requiring airway management thus transferred to acute setting. CTA showed V4 segment of left vertebral artery thrombosis with proximal V3 segment left vertebral artery stenosis confirms provisional diagnosis of TOBS. Patient succumbed 10 days later due to evolving stroke.

Conclusion: Hypersomnolence due to TOBS can mimic SDB manifestation in the post-acute stroke period. High suspicion of stroke progression is vital. Vigilance in recognizing basilar artery dense sign is crucial to detect basilar artery thrombosis, potentially leading to TOBS which has high mortality.

CASE STUDY: REHABILITATION CHALLENGES OF A PATIENT WITH LEFT HEMINEGLECT AFTER A RIGHT MIDDLE CEREBRAL ARTERY TERRITORY INFARCT

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ABSTRACT

Introduction: Neglect is a disorder of attention where a patient doesn't respond to stimuli contralateral to the brain lesion site, which isn't attributed to a primary sensory or motor cause. The case highlights the rehabilitation interventions and challenges for a patient with severe neglect.

Methods: A case report of a patient with severe neglect after stroke.

Results: A 61-year old Malay lady was admitted for stroke rehabilitation following a right parietal lobe infarct two weeks after the stroke onset. She presented with severe personal, peripersonal and extrapersonal neglect. Goal setting prior to admission highlighted the neglect severity which may impede functional recovery.
She underwent a rehabilitation program over four weeks which included several neglect interventions, encompassing a top-down and bottom-up approaches. Interventions included providing auditory and tactile stimulus on the left, promoting visual scanning, transcutaneous electrical nerve stimulation and use of visually contrasting distractors on the left side and visual biofeedback using full-length mirror
Outcome measures were recorded on admission and on discharge.
Modified Barthel Index scoring improved from 8% to 21%. Berg Balance Score remained the same at 0/56. Repeat paper and pencil testing showed a slight improvement in her neglect. Catherine Bergego Scale improved from 22/30 to 16/30. Ecological assessment noted a slight improvement in her daily activities, especially for feeding.
Despite minimal objective gains in functional outcome scores, both the patient and the carer were satisfied with the rehabilitation outcomes.

Conclusion: The presence of neglect is a challenge in rehabilitation and benefits from early detection. Unilateral neglect is a negative prognostic factor after stroke and a cautious approach should be adopted when counselling patients and caregivers during rehabilitation goal setting. Specialized neglect interventions should be included as part of the rehabilitation program to ensure the best outcomes and improved quality of life for the patient.

NURSE-LED ACTIVITIES TO INCREASE ACTIVITY AND FACILITATE RECOVERY AMONGST INDIVIDUALS WITH STROKE IN AN INPATIENT REHABILITATION SETTING

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ABSTRACT

Introduction: Florence Nightingale's Environmental Theory defined Nursing as "the act of utilizing the environment of the patient to assist him in his recovery." In a rehabilitation ward, nurses have a central role in the interprofessional team and in all care activities, specifically to encourage patients' activity levels. Creative use of the environment is a contributing factor to encourage activities and facilitate recovery.

Objective: To illustrate the active role of rehabilitation nursing in increasing patients' activities in an inpatient stroke rehabilitation setting; complementing the concept of Environmental Enrichment embraced in the inpatient stroke rehabilitation setting.

Method: Illustrative report of the spectrum of Nurse-Led Activities (NLA) organized in an inpatient stroke rehabilitation setting.

Results:The Nurses-Led Activities (NLA) are systematically organized to provide motor, sensory, cognitive and social stimulation, and delivered via various approaches. Stimulating activities in a spacious and safe environment are part of essential element in conducting NLA. The NLA include multifaceted activities comprising of exercise-based activities (Taichi), recreational activities (gardening), leisure (karaoke, fish-feeding), art and craft (painting, flower arrangement) and game matches (Bingo, Jenga). Social interactions are encouraged by promoting the use of communal space in the ward lounge. Family participation is highly encouraged during the NLA sessions.
Narrated benefits of the NLA include increase physical activity, elevate psychological outlook and improve family participation. After NLA sessions, patients are noted to perform more self-directed practices and demonstrate improved self-efficicacy and autonomy.

Conclusion: Rehabilitation nursing role in the interdisciplinary stroke rehabilitation management is tremendous. In the absence of therapist-led intervention during afterhours and weekends, nurses play a big role to increase overall activity level. NLA is a feasible approach of delivering opportunities to increase meaningful activities amongst individuals with stroke in the inpatient rehabilitation setting. NLA has reframed nursing practices into a distinctive role in promoting overall recovery.

NEUROLOGISTS VERSUS NON-NEUROLOGISTS THROMBOLYSIS (NNT) STROKE STUDY: INTRAVENOUS THROMBOLYTIC FOR ADULTS WITH ACUTE ISCHAEMIC STROKE IN MALAYSIAN PRIMARY STROKE CENTRES VERSUS ACUTE STROKE READY HOSPITALS: COMPARISON OF SERVICE EFFICIENCY AND PATIENTS' CLINICAL OUTCOMES

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ABSTRACT

Introduction: Intravenous thrombolysis with recombinant tissue plasminogen activator (rt-PA) is beneficial in acute ischaemic stroke (AIS) even when administered by non-neurologists in non-stroke centres. We aim to compare the efficiency, effectiveness, and safety of such therapy in Malaysian primary stroke centres (PSCs) versus acute stroke ready hospitals (ASRHs) without in-house neurologists.

Methods: We conducted a hospital-based, multi-centre, periodic cross-sectional study in Malaysia. Through retrospective review of medical records, real world data was extracted/collected for analysis. Consecutive adults with AIS who received IV rt-PA therapy from 01 January 2013 to 31 March 2020 in the selected PSCs and ASRHs were included. Statistical significance was set at $p<0.05$.

Results: A total of 299 adults, namely 225 (75%) from PSCs and 74 (25%) from ASRHs, were included. Both groups were matched in age (57.6±13.2 vs 56.6±12.9 years, p=0.569) and male:female gender ratio (65%:35% vs 62%:38%, p=0.621). Their NIHSS upon presentation, namely 12.8±6.1 in PSCs and 13.8±5.1 in ASRHs, were fairly comparable with p=0.182. Both PSCs and ASRHs recorded comparable door-to-needle time (91.6±45.6 vs 96.8±40.7 minutes, p=0.376). Similar proportion of patients recorded mRS≤1 within 3 months post-rt-PA, namely 45.4% in PSCs and 48.6% in ASRHs with p=0.630. The rates of intracranial haemorrhage (ICH) in PSCs versus ASRHs groups, specifically (i) any ICH (18.2% vs 20.3%, p=0.695), (ii) symptomatic ICH (10.7% vs 8.1%, p=0.525), and (iii) fatal ICH (4.0% vs 5.4%, p=0.742) were comparable. Similar 90-day overall mortality rates (15.6% vs 16.2%, p=0.892) were recorded.

Conclusion: Our study may provide translational real-world evidence which suggests that IV rt-PA therapy in AIS can be equally safe, effective, and efficiently delivered in both Malaysian PSCs and ASRHs. This potentially practice-changing evidence may encourage the establishment of such service in more local hospitals without in-house neurologists, hence extending the benefits to a greater proportion of Malaysian populations.

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ENDOTHELIN-1 INDUCED FOCAL ISCHEMIA IN ADULT ZEBRAFISH: A MODEL WITH NOVEL ENTITY OF STROKE RESEARCH

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ABSTRACT

Introduction: Stroke is the recurrent threat of mortality worldwide among normal population and 3 fold more in diabetics, requires intense research to investigate new therapeutics.

Objective: Current animal models have restricted reproducibility, less similarity and having technical limitations.

Methodology: In our study, pink zebra-Daniorerio was used for induction of stroke. Diabetes was induced with 111mM D-glucose for 14 days and zebrafish having more than 100 mg/dl blood glucose level were included in study. The experimental stroke was induced with single oral administration of Endothelin-1 3µl/gm of zebra-fish. The swimming, behavioural-patterns and cognitive performance(Y-maze, T-maze) was recorded and analysed with UMA Tracker. The brains were extracted for histopathological investigations.
Results: Administration of ET-1 in normal and diabetic group showed statistically significant ($p<0.001$) change in swimming pattern and movements (circulatory, irregular, disturbed, rotating). Moreover, diabetic ET-1 treated group produced statistically significant ($p<0.001$) change in swimming pattern and recovery time. Behavioural study of ET-1 treated groups showed disturbed cognitive profile and locomotors coordination ($p<0.001$) by increasing in the number of mistakes and reducing total distance travelled in neurocognitive assessment paradigm. Histopathological analysis of ET-1 treated groups indicated cortical lesions, shrinked neuronal cells and activated thrombocytes with disturbed normal flora of brain compared to normal control.

Conclusion: Current experimental model exerts more stability, reproducibility and genetic similarity with human stroke pattern over other available rodent models of stroke. Due to its novelty, overcoming technical errors from recent models, reproducibility and genetic similarity, ET-1 induced experimental zebrafish stroke model exerts new horizons for stroke therapeutics and diabetes associated stroke research.

POLY (LACTIDE-CO-GLYCOLIDE) NANOPARTICLE ENCAPSULATING BRAIN-DERIVED NEUROTROPHIC FACTOR PROMOTES NEUROPROTECTION IN AN ACUTE ISCHEMIC STROKE MODEL IN THE RAT

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ABSTRACT

Introduction: Poly (lactide-co-glycolide) (PLGA) nanoparticles (NPs) are biodegradable and biocompatible drug carriers and competent at delivering neuroprotective agents to the brain following intravenous administration. Brain-derived neurotrophic factor (BDNF) could provide neuroprotection in ischemic brain injury. We tested the neuroprotective effect of PLGA nanoparticle-bound BDNF (NPBDNF) on a permanent middle cerebral artery occlusion (pMCAO) model of ischemic rats.

Methods: Sprague-Dawley rats were divided into 4 groups of 7 rats each. Group 1 was subjected to sham operation, group 2, 3, and 4 were subjected to permanent MCAO (pMCAO). Four hours after pMCAO, group 3 and 4 were intravenously (IV) treated with BDNF and BDNF-NPs, respectively. Functional outcome was assessed at 2 and 24 hours after pMCAO, using the modified Neurologic Severity Score (mNSS), and rotarod performance test. Following functional assessments, rats were euthanized by terminal cardiac puncture, whereby blood was taken to assess for neurobiomarker level, the neuron spesific enolase (NSE). The brain was evaluated to measure the infarct area.

Results: The NPBDNF treated group demonstrated significant functional improvement in mNSS, evidenced by a mild injury correlated with a decreased in mNSS score by 2.0 and 2.1 times, respectively, when compared with pMCAO and BDNF treated groups. The NPBDNF treated group showed improved rotarod performance, by 2.44 and 2.77 fold increases in latency time to fall on the rotarod, compared to MCAO and BDNF treated groups, respectively. The infarct volume in rats treated with BDNF-NPs was significantly smaller by 1.91 fold compared to the MCAO group and 1.95 fold compared to the BDNF treated group. These results were further corroborated by the NSE level estimates.

Conclusion: NPBDNF exhibit a significant neuroprotective effect in the pMCAO model of ischemia in rat following intravenous administration.

TELE-CONSULTATION FOR AUGMENTATIVE AND ALTERNATIVE COMMUNICATION IN INDIVIDUALS WITH LOCKED-IN SYNDROME

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ABSTRACT

Introduction: Locked-In Syndrome (LIS) is a rare condition in which a person is aware, but has tetraplegia, dysphagia and aphasia as a result of midbrain and/or pontine stroke. Typically, communication is achieved via vertical eye movements and eye-blinking.

Objective: To illustrate Augmentative and Alternative Communication (AAC) options available to LIS patients, as discussed using tele-consultation.

Methods: Case-series on two individuals with LIS admitted for intensive stroke rehabilitation. An international AAC consultant was sought to review and enhance AAC options via tele-consultation. Recommendations were made to modify existing communication boards and mounting systems, as well as to consider further investigations.

Case Series: Mr. AR is a 50-year old ex-policeman who developed classic LIS due to brainstem and cerebellar infarcts secondary to basilar artery thrombosis. He is able to scan and match pictures, words, letters and numbers consistently by vertical eye movements and generating dual response via blinking once for 'yes' and twice for 'no'. Recommendation on communication involves organizing his alphabet board according to the frequency-of-use alphabets in the Malay language, for energy conservation and efficient communication.
Mr. FB: 46-year old bank-officer who developed brainstem and left cerebellar infarcts secondary to basilar artery thrombosis. He has occasional muscle twitching in his left forearm and index fingers. Vertical eye movements are unreliable as he has oscillatory nystagmus and right divergent strabismus. Dual response is generated by looking upwards for 'yes' and downwards for 'no'. It was recommended that an electromyogram (EMG) using surface electrodes be conducted to detect muscle activity which potentially may activate an EMG switch connected to a switch-scanning AAC device.

Conclusions: Communication deficits in people with LIS require multidisciplinary inputs to augment and facilitate communication between the patient and their partners/carers. AAC techniques need to be customised according to the patients' residual functions, culture, language and available resources.

TELENEUROREHABILITATION DURING COVID-19 PANDEMIC IN MALAYSIA

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ABSTRACT

Introduction: Teleneurorehabilitation is a useful method to deliver stroke care despite the Movement Control Order (MCO) in a pandemic. Patients can still access neurorehabilitation, conduct therapies, receive medications and referrals through teleconsultations. This ensures access and continuity of care for individuals with stroke.

Objective: To describe the use of teleneurorehabilitation during the Covid-19 pandemic MCO in Malaysia for stroke patients scheduled for follow-up appointments.

Methods: A cross-sectional descriptive study was conducted from the 31 March 2020 to 5 May 2020, during the MCO period in Malaysia. Follow-up stroke patients scheduled to attend neurological Rehabilitation clinic in Hospital Rehabilitasi Cheras, Kuala Lumpur, Malaysia were called prior to their appointments using a standard script. Issues which could not be resolved via teleconsultation were given the option to attend clinic for face-to-face review or reschedule their appointments. The issues addressed, continuation of medication and the duration of the teleconsultation were recorded in their medical files.

Results: A total of 291 appointments were scheduled for seven clinic sessions. A third (31.6%) of stroke patients received tele-consultation, comprising medical advice (100%), extension of medical certificates (2.5%) and renewal of medication prescription (34.8%). A third (34%) of them appointed representatives to collect the medications at the clinic, while 66% opted for telepharmacy via local postage. The average teleconsultation time was 8.9 minutes (min 5 minutes, max 20 minutes).

Conclusions: Teleneurorehabilitation is an efficient, value-added tool to ensure continuity of care during a pandemic and may be useful for individuals with logistics issues. Tele-pharmacy is a common component in teleneurorehabilitation consultation.

EVALUATION OF ORAL HEALTH STATUS AND SALIVARY PARAMETERS AMONG STROKE PATIENTS IN HOSPITAL USM, KELANTAN

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ABSTRACT

Introduction: Dental caries and poor salivary function are common in patients with stroke. Few studies of their salivary parameter assessment have been published. This research has been carried out to determine oral health and salivary parameters in stroke patients

Methods: Cross-sectional study was conducted on 54 stroke and 54 non-stroke patients attending Rehabilitation Medicine Unit in Hospital USM. Clinical oral examination was performed using DMFT index and plaque score. Salivary flow, pH and buffering capacity were determined using the Saliva-Check BUFFER kits and salivary cortisol was measured using Cobas E6000 analyzer.

Results: Most stroke patients were Malay (72.2%), male (63.0%), with mean (SD) age of 48.1(14)years while majority of non-stroke patients were Malay (90.7%), female (57.4%), with mean (SD) age of 40.1(16) years. There was a significant difference in caries experience between stroke and non-stroke patients with mean (SD) DMFT of 17.6(4.26) and 15.7(5.38) respectively (p=0.042). Stroke patients had significantly less percentage of good oral hygiene (53.7%) compared to non-stoke patients (85.2%); p=0.001

The median (IQR) of salivary flow rate was similar in both groups (0.49(0.4)mL/min) and pH was 6.60(0.5) for stroke and 6.60(0.4) for non-stroke patients meanwhile salivary cortisol was 5.21(5.1)nmol/L for stroke and 4.0(3.6)nmol/L for non-stroke patients. Mean (SD) of salivary buffering capacity was 6.06(2.8) for stroke and 5.41(2.4) for non-stroke patients. All salivary parameter showed no significant differences between the two groups; (p>0.05). There was no significant correlation between salivary parameter and DMFT; (p>0.05).

Conclusion: Oral health status of stroke patients is compromised. Therefore, it is important to take account of salivary parameters and caries experience among stroke patients and the preventive measure in this population should be implemented.

THE NEUROPROTECTIVE EFFECT OF (S)-3,5-DHPG PRECONDITIONING VIA DOWN REGULATORY ANTAGONIST MODULATOR (DREAM) IN ACUTE ISCHEMIC STROKE RATS

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ABSTRACT

Pharmacological preconditioning is an avenue in protecting and reducing the ischemic induced neuronal damage. In vitro studies have shown that prior activation of group I metabotropic receptor (mGluR) with (S)-3,5-dihydroxyphenylglycine ((S)-3,5-DHPG) elicits neuroprotection. This activation of group I mGluR regulates the expression of Down Regulatory Antagonist Modulator (DREAM). This study elucidates the neuroprotective effect of group I mGluR agonist preconditioning, (S)-3,5-DHPG via DREAM in acute ischemic stroke rats.

One, 10, or 100 µM (S)-3,5-DHPG was administered intrathecally to six adult male Sprague Dawley rats 2 hours before the middle cerebral artery occlusion. After 24 hours, the modified neurological severity score (mNSS) and grid walking test were assessed. The rats were sacrificed, and the infarct brain volumes were estimated by 2,3,5-triphenyltetrazolium chloride staining. The serum level of neuron-specific enolase (NSE) was assessed by ELISA. The ischemic penumbra tissue was dissected. The proteins were extracted, and the levels of nuclear and cytoplasmic DREAM were estimated by Western blot. The expression of dream gene was analyzed by qRT-PCR.

One or 10 µM of (S)-3,5-DHPG preconditioning in stroke rats has significantly improved the neurological functions, reduced brain infarction and the NSE level. The DREAM protein has significantly increased in the nuclear compartment after 2 hours of 1 µM (S)-3,5-DHPG administration and in the cytoplasmic compartment after 24 hours of 100 µM (S)-3,5-DHPG administration. 1 µM (S)-3,5-DHPG preconditioning has significantly reduced the level of DREAM protein activity after 24 hours of an ischemic stroke. The expression of dream gene was decreased in 1 µM (S)-3,5-DHPG preconditioning compared to non-preconditioning ischemic stroke rats.

The 1 and 10 µM of (S)-3,5-DHPG preconditioning enhanced the protective mechanism via promoting the nuclear DREAM protein whereas 100 µM of (S)-3,5-DHPG preconditioning exacerbated the ischemic injury. Further studies are warranted to investigate the gene involved in this DREAM-mediated regulation.

THE EFFECTS OF HYPOTHERMIA AND P4 ON GLT-1 AND P62 OF PRIMARY CORTICAL ASTROCYTES FOLLOWING EXPOSURE TO GLUTAMATE TOXICITY.

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ABSTRACT

Glutamate excitotoxicity involves the massive release of glutamate extracellularly, thereby inducing glial injuries. Hypothermia offers neuroprotection; however, prolonged time is required to exert its effects as well as variation in the outcomes. Adjuvant therapy with hypothermia may reduce exposure time and obtain consistent outcomes. Progesterone (P4) is a neurosteroid that has been shown to elicit neuroprotection in neuronal cells with ischemic injury. This study investigates the effects of hypothermia and P4 on astrocytes following glutamate-induced toxicity.

The cultured primary cortical astrocyte cells were exposed to 50 µM of glutamate for 15 minutes followed by incubation under mild or moderate hypothermia with and without P4 for 24 hours. The viability of cells was assessed by 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT) assay. The intracellular concentration of glutamate was estimated by the glutamate uptake assay. The levels of S100β and p62 were measured using ELISA. The membrane protein was extracted and estimated for GLT-1 by Western Blot.
There were significant increases in the percentage of viable cells as well as the concentration of glutamate uptake by the astrocyte cells in mild hypothermia with P4 ($p<0.01$) and moderate hypothermia with P4 ($p<0.01$) as compared to normothermia after glutamate-induced toxicity. There was a significant effect of moderate hypothermia with P4 ($p<0.01$) in increasing the S100β level in comparison to normothermia across the glutamate-induced toxicity groups and significantly increasing in glutamate uptake ($p < 0.01$) after treated with both mild and moderate hypothermia and P4. There was a significant increase in membrane GLT-1 in both mild hypothermia ($p<0.01$) and moderate hypothermia ($p<0.01$) group when compared to the normothermia group. The p62 level was significantly reduced in both mild and moderate hypothermia and P4 ($p<0.01$) across the glutamate-induced toxicity group.

In conclusion, hypothermia and P4 reduced the glutamate-induced toxicity in the astrocyte cells by increasing glutamate uptake via GLT-1.

ASSESSMENT OF AWARENESS AND ACTION TOWARDS SIGNS AND SYMPTOMS OF STROKE AMONG LAY PUBLIC IN KUANTAN, MALAYSIA: A CROSS-SECTIONAL A STUDY

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ABSTRACT

Background: Stroke remains one of the leading causes of mortality and disability in both developing and developed countries. Lack of awareness towards signs and symptoms of stroke leads to delayed presentation to the hospital, contributing towards increased morbidity and mortality. This study aimed to assess the awareness of and action towards signs and symptoms of stroke.

Methods: A cross-sectional study interview-based survey was performed among 393 lay public (age range: 18-64 years old) in states of Pahang, Kuantan city, Malaysia from June to September 2019. Chi-square tests were used to assess the knowledge of differences between participants with good education and income and those with low education and incomes. as well as logistic regression to obtain the factors effecting to the knowledge of stroke symptoms.

Results: Mojority of respondents (n=309,78,6%) identifed sudden face, arms and leg numbness, whereas (n=165,42%) of them identifed problems in vision as stroke symptoms. However, (n=39,10.4%) were unaaware of any symptoms, while (n=117,30%) identified appropriate action. Furthermore, (n=349, 88.8%) recognized at least one stroke symptom,(n=108, 27.5%) of them identifed all five stroke symptoms, and (n=37,9.4%) of individuals had excellent awareness (aware of all five stroke symptoms and appropriate action “calling an ambulance”). Multivariable logistic regression shows that individuals aged 18-45 years (OR=0.054, 95% Cl=0.006-0.500, p=0.010), self-employed (OR=12.430, 95% Cl=1.372-31.908, p=0.028), those who were diagnosed with hypertension (OR=0.129, 95% Cl=0.025-0.673, p=0.015) and students (OR=35.945. 95% Cl=1.745-740.615, p=0.020) were more likely to recognize all the five stroke symptoms and appropriate action.

Conclusion: The awareness and action towards signs and symptoms of stroke is poor among lay public in Kuantan, Malaysia. Therefore, the findings of this study would be a baseline for program interventions that focus on public awareness and policy development on stroke management.

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STROKE REHABILITATION IN HOSPITAL RAJA PEREMPUAN ZAINAB II: A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: Stroke remains a significant global health problem and one of the leading causes of death in Malaysia. With recent medical advancement, the number of stroke survivors have increased but majority of them dependent functionally. The role of stroke rehabilitation undoubtedly plays an important role in improving the quality of life and independency of the survivors. This study aimed to assess the stroke rehabilitation services in HRPZ II: from the referral rate, compliancy and the functional outcome of stroke survivors following one year of rehabilitation.

Methodology: A cross sectional study involving all new stroke cases who admitted to HRPZII from January until December 2017 and later referred for post stroke rehabilitation. Their modified Rankin Scale (mRS) pre and 1-year post rehabilitation were collected and analysed.

Result: A total number of new stroke patients were 263 in which 139 (52.9%) of them were referred and seen by rehabilitation team at least once, whereas 110 (79.1%) patients did not attend the subsequent follow up. Among them, 29 (20.9%) patients were compliant to follow up until they were discharged or at least for 1 year. Pre-rehabilitation mean mRS was 3.62 (STD 1.18), one-year post rehabilitation mean mRS was 1.59 (STD 1.12) and the difference of both was statistically significant with P value <0.05.

Conclusion: Though the benefits of stroke rehabilitation were well established, there was a difference in the clinical practice particularly in HRPZ II. Future prospective studies of multi-hospitals are warranted to observe the real picture and other factors that could attribute to such pattern. The gap can be bridged by creating more awareness to the local public and healthcare providers regarding the service and the importance of stroke rehabilitation.

FACTORS AFFECTING ARRIVAL TIME OF ACUTE ISCHAEMIC STROKE PATIENTS IN PUSAT PERUBATAN UNIVERSITI KEBANGSAAN MALAYSIA

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ABSTRACT

Introduction: Stroke reperfusion therapy improved the acute Ischaemic Stroke patients' outcome. Our current stroke centres are primary stroke centre which offer intravenous thrombolysis which is indicated for up to 4.5 hours from stroke onset without thrombectomy facility. Our study aims to identify the factors of arrival time for acute ischaemic stroke patients to our centre.

Methods: We conducted a cross-sectional study and recruited patients with acute Ischaemic Stroke admitted to PPUKM. They are divided to 2 groups based on arrival time from onset of stroke till emergency department. The 2 groups are early-arrival group (arrival time <= 4.5 hours) and late-arrival group (arrival time > 4.5 hours). Data was collected with standard and validated Stroke Knowledge Test (SKT) questionnaires.

Results: A total of 153 patients who presented with acute stroke were recruited. 31.4% of patients were in the early-arrival group vs. 68.6% patients were in the late-arrival group. Factors associated with early-arrival are younger age (p = 0.024), mode of arrival by ambulance (OR 2.59; Cl (1.17-5.72); p = 0.017), history of Ischaemic heart disease (OR, 3.66; Cl (1.30–10.31); p = 0.007), body weakness (OR, 4.76; Cl (1.06–21.41); p = 0.027) and facial asymmetry (OR, 3.05;Cl (1.48-6.29); p = 0.002). Late arrival patients are associated with poor score in SKT (OR, 3.51; Cl (1.41-8.71); p = 0.005), older age group (p=0.024), low NIHSS (p=0.001) and low income group (p = 0.004). The study also found that belief and practice of TCM did not affect the stroke arrival time.

Conclusion: Poor stroke awareness, mild stroke severity and low income are associated with late arrival to the hospital. Stroke awareness campaign to educate the public should be plan in the future to ensure early arrival which can lead to a better clinical outcome.

OUTCOMES OF ANTIPLATELET THERAPY FOR SECONDARY PREVENTION IN PATIENTS WITH ISCHAEMIC STROKE OR TRANSIENT ISCHAEMIC ATTACK

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ABSTRACT

Background: This study aimed to assess effectiveness and safety outcomes of antiplatelet therapy for secondary prevention among patients with ischaemic stroke or transient ischaemic attack (TIA) in Malaysia.

Method: Patients aged ≥18 years diagnosed with a first ischaemic stroke/TIA between 2014 and 2017 were identified from stroke registry. Data in the registry was linked with other data sources for information on antiplatelet exposure and outcome events. Exposure was defined as treatment with an antiplatelet therapy at discharge from the index stroke hospitalisation and categorised into single antiplatelet therapy (SAPT) and dual antiplatelet therapy (DAPT) groups. Primary outcome was composite events of stroke, myocardial infarction, and all-cause death at up to one year after the index stroke in an intention-to-treat analysis. We used Cox proportional hazard models to calculate hazard ratios (HR) with 95% confidence interval (CI).

Results: Among 4434 patients included in the analysis, mean age was 61.2 years and 57.5% were male. Two-hundred-ninety-nine (6.7%) of these patients were treated with DAPT while the remaining were in SAPT group. Composite events occurred in 8.1% of patients in DAPT group and in 17.8% of patients treated with SAPT ($p<0.001$). The rates of individual events were lower among DAPT compared to SAPT group: recurrent stroke (4.7% versus 6.1%), myocardial infarction (1.3% versus 2.3%), and all-cause death (2.1% versus 9.3%). Bleeding occurred in 2.0% of patients in DAPT group versus 1.6% of patients in SAPT group. Multivariable-adjusted Cox regression analysis showed that rates of composite outcome was lower among DAPT compared to SAPT group (HR 0.53, 95%CI 0.32 to 0.87).

Conclusion: In patients with ischaemic stroke/TIA, treatment with DAPT following the index stroke was associated with reduced risk of the composite events of stroke, myocardial infarction, and death. There appears to be similar risk of bleeding with DAPT versus SAPT.

USE SMARTPHONE APPLICATION TO SAVE LIFE IN PATIENTS OF ACUTE ISCHEMIC STROKE

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ABSTRACT

Introduction: In 2019, cerebrovascular accident is the first cause of disability in Taiwan. And the large artery occlusion is one of the devastating events among cerebrovascular accident. In 2015, five big clinical trials confirmed the strong benefit of intra-arterial thrombectomy for these patients. But the thrombectomy is highly technic and facility-dependent procedure, especially to maintain 24-hour available service. In central Taiwan, only our hospital (China Medical University Hospital) can achieve this whole-day thrombectomy treatment. So many surrounding hospitals transfer their large artery occlusion patients to our hospital, with increasing transfer number since 2017. But we found doctors and nurses waste lots of time in communication during interhospital transfer. We started to use smartphone application, "LINE", to solve this problem.

Methods: We used smartphone application, "LINE" to create a security platform for interhospital transfer communication. We did retrospective chart review of these transfer patients. We started to use "LINE" since January 2018. So we chose the period of May 2017 to December 2017 as baseline. Then compare the characteristics and outcome of thrombectomy patients in 2018 and 2019.

Results: After used the smartphone application, the number of transfer patients greatly increase, from 63 patients in 2017, to 113 patients in 2018, then 175 patients in 2019. And the door to puncture time of these transfer patients decreased, from 109 minutes (2017), to 102 minutes (2018), then 91 minutes (2019), P value= 0.041 (by one way ANOVA in SPSS software). And the percentage of good outcome (90-day modified Rankin Scale= 0, 1, 2) patients after thrombectomy increase, from 11.4% to 21.7%.

Conclusion: Smartphone application as "LINE" enhance the interhospital communication. And thus speed up the door to puncture time and improved the outcome in three months.

FRAILTY AND ITS ASSOCIATION WITH CHARACTERISTICS AND OUTCOMES OF OLDER PERSONS WITH ACUTE STROKE

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ABSTRACT

Introduction: Frailty is a geriatric syndrome associated with adverse outcomes. The aim of our study is to determine patient characteristics and outcomes in older adults with acute stroke, comparing those with and without pre-stroke frailty.

Methods: This retrospective observational study included adults aged ≥65 admitted to the geriatric medicine unit of our university hospital with acute stroke between January 2015-January 2020. Pre-stroke frailty was scored by the Clinical Frailty Scale (CFS), from 1-8, with higher numbers indicating higher degrees of frailty.

Results: To date, we included 223 patients with a mean age of 81.2±6.3. This cohort was classified into two groups: non-frail (CFS 1-4, 40.3%) and frail (CFS 5-8, 59.7%).
Compared to the non-frail, frail patients were more likely to be ≥85 years old ?(35.9% vs 14.9%, p=0.003), residing at nursing homes (15.3% vs 3.6%, p=0.007), have recurrent strokes (48.0% vs 20.9%, p=0.000), be cognitively impaired (36.2% vs 9.4%, p=0.000), and have polypharmacy (50.0% vs 28.7%, p=0.002).
Outcome-wise, Ffrail patients were more likely to be discharged to nursing homes (OR=3.4, 95% CI 1.2-9.5, p=0.016), be chair/bed bound (OR=3.5, 95% CI 1.4-8.7, p=0.007), and have a higher post-stroke Modified Rankin Score (OR=28.14, 95% CI 3.6-217.7, p=0.000).
Comparing CFS 5-6 to CFS 7-8, those with CFS 7-8 had higher in-patient mortality rates (OR=4.7, 95% CI 1.8-11.9, p=0.001) and 1-year mortality rates (OR=9.8, 95% CI 3.1-31.3, p=0.000). Logistic regression analysis confirmed that CFS 7-8 was an independent predictor of mortality.
Patients with pre-stroke CFS 7-8 had higher risks of inpatient complications, including acute kidney injury (OR=3.7, 95% CI 1.6-8.4, p=0.001), depression (OR=2.6, 95% CI 1.0-6.7, p=0.043), pressure ulcer (OR=4.4, 95% CI 1.8-10.5, p=0.001) and spasticity (OR=3.7, 95% CI 1.6-8.6, p=0.002).

Conclusion: Pre-stroke frailty is associated with poorer outcomes post-stroke. Knowledge of pre-stroke frailty levels can guide multidisciplinary management plans and improve outcomes in older adults with stroke.

FACTORS CONTRIBUTING TO MORTALITY AND PROLONGED LENGTH OF STAY AMONG OLDER PERSONS ADMITTED WITH ACUTE STROKE

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ABSTRACT

Introduction: Acute stroke in an older person can cause considerable morbidity, mortality, healthcare utilisation and cost. The aim of this study is to determine predictors of prolonged length of stay (PLOS) and mortality in older persons with acute stroke.

Methods: This retrospective observational study included adults aged ≥65 admitted to the geriatric medicine unit of our university hospital with acute stroke between January 2015-January 2020.

Results: To date, data on 223 patients (61.4% female) with an average age of 81±6.31 years were included. Inpatient mortality rate was 17%. Stroke subtypes were: 74% lacunar, 11.7% total/partial anterior circulatory, 11.2% haemorrhagic, and 3.1% posterior circulatory. The median length of stay (LOS) was 14 days (0-119 days). Any LOS longer than 22 days (75th-centile) was taken as prolonged.

Inpatient complications observed were: Infection (urinary tract and/or pneumonia) (43.9%), acute kidney injury (AKI) (31.5%), spasticity (25.7%), stroke extension (18.9%), pressure ulcers (17.1%), depression (17%), haemorrhagic transformation (11.9%), seizures (4%), and pulmonary embolism (0.9%).

Multivariate logistic regression analysis revealed these independent predictors of PLOS: normal premorbid cognition (adjusted OR=3.45, 95% CI 1.28-9.3, P=0.014), stroke extension (OR=3.54, 95% CI 1.5-8.35, P=0.004), and infection (OR=3.9, 95% CI 1.85-8.2, P<0.001).

Predictors for inpatient mortality were premorbid Clinical Frailty Scale (CFS) 7-8 (OR=5.39, 95% CI 1.21-24.07, P=0.027), CKD stage 4-5 (OR=3.75, 95% CI 1.33-10.58, P=0.012), haemorrhagic transformation (OR=4.29, 95% CI 1.32-13.96, P=0.016), and infection (OR=4.1, 95% CI 1.56-10.78, P=0.004). Predictors of one-year mortality were CFS 7-8 (OR=9.16, 95% CI 1.02-82.53, P=0.048), CKD (OR=10.93, 95% CI 1.55-77.26, P=0.017), IHD (OR=4.16, 95% CI 1.07-16.24, P=0.04), and infection (OR=13.46, 95% CI 4.28-42.28, P<0.001).

Conclusions: We identified several factors associated with mortality and PLOS. This can help in formulating a multidisciplinary management plan including rehabilitation, prevention of complications, advanced care planning and the ceiling of care for older persons admitted with acute stroke.

ASSESSMENT OF EFFECT OF AGE ON GLASGOW COMA SCALE (GCS) AND NATIONAL INSTITUTES OF HEALTH STROKE SCALE (NIHSS) IN STROKE PATIENTS

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ABSTRACT

Introduction: Methods to quantify the neurological deficits among stroke patients include the NIHSS and GCS score. GCS is commonly used to measure the severity of brain damage by assessing the level of consciousness. NIHSS is developed to quantify the neurological disability in stroke patients. GCS is greatly affected by conscious level and delirium which affects conscious level occurs more commonly in elderly. This study aimed to assess the effects of age on the GCS and NIHSS scoring in patients with acute stroke.

Method: Adult patients (aged 18 and above) with acute stroke from January 2014 to December 2015 and were registered with complete data into the Malaysia National Neurology Registry (NNeuR) were included. Patients were categorized into young adults (aged 18–59) and elderly (aged 60 and above). GCS scores on admission according to the NIHSS categories (no impairment, mild, moderate, moderate to severe, severe) were analysed using Independent t test and Mann Whitney test to assess the difference between the age groups.

Results: 1002 stroke patients were included in the analysis. 435 (43.4%) were young adults while 567 (56.6%) were elderly. There were 411 (94.5%) and 545 (96.1%) ischaemic stroke in young adults and elderly patients respectively (p-value 0.220). In-hospital death occurred in 9 (2.1%) among young adults and 20 (3.5%) among elderly (p-value 0.172). Young adults and elderly had no significant differences in GCS scores in the NIHSS score 0 (14.73 vs 14.71, p-value 0.965), NIHSS score 1-4 (14.80 vs 14.81, p-value 0.940), NIHSS score 16-20 (12.60 vs 11.74, p-value 0.318) and NIHSS score 21-42 (10.12 vs 11.13, p-value 0.172). A significant difference in GCS score was only noted in NIHSS score 5-15 (14.62 vs 14.24, p-value 0.018).

Conclusion: There were no differences in the GCS score between young adults and elderly in most of the NIHSS categories.

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FALLS AFTER STROKE AT THE UNIVERSITY OF MALAYA MEDICAL CENTRE FALLS CLINIC

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ABSTRACT

Introduction: Stroke is a leading cause of disability world-wide. Moreover, post-stroke individuals are at higher risk for falls. Several observational studies have identified a variety of demographic, post-stroke functional impairment and physiological factors that increase the risk of falls among this group.

Objectives: The aim of this study was to compare the frequency of falls among post-stroke individuals compared to individuals without stroke. Secondly, to evaluate characteristics associated with falling and to describe the consequences of fall associated with stroke.

Methods: Data collected from the Falls Clinic, University Malaya Medical Centre registry (since June 2013 to October 2018) were analysed for this retrospective cross-sectional study. The data collected including patient demographics, predisposing factors and symptoms related to fall and the fall's consequences such as hospitalisation and fracture.

Results: Out of 918 fallers, 96 of them are faller had a background of stroke, in which 43 are males (44.8%) and mean age was 74 years old. Fallers with stroke were more likely to report dizziness 35.4% (p-value 0.012), hearing problems 13.5% (p-value 0.002) and visual problem 19.8% (p- value 0.003) than fallers without stroke. In term of consequences, the result showed stroke survivors had sustained injuries related to fall such as fracture (7.3%), soft tissue injuries (8.3%). Nine individuals (9.4%) visited emergency department post-fall and seven (7.3%) required hospitalisation.

Conclusion: Using a real-world falls registry, we identified than fallers with stroke had different characteristics compared those without stroke. In particular, dizziness was a prominent symptom. Future studies should be targeted at develop stroke-specific fall intervention as individuals with stroke make up over 10% of all patients presenting to a fall service.

OUTCOMES OF THROMBOLYSIS THERAPY FOR ACUTE ISCHEMIC STROKE IN A NON-NEUROLOGIST GOVERNMENT HOSPITAL IN NORTHERN REGION OF MALAYSIA

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ABSTRACT

Introduction: A stroke team involved multidisciplinary team from emergency, medical, radiology and laboratory department formed in Hospital Sultan Abdul Halim (HSAH), a non-neurologist government hospital to provide thrombolytic therapy for acute ischemic stroke (AIS) since September 2019 with support from neuromedical team from Hospital Seberang Jaya and neurosurgical team from Hospital Sultanah Bahiyah. There are limited data on thrombolytic therapy for AIS in non-neurologist hospital. We therefore analysed data of stroke thrombolysis to determine its favourable outcomes with National Institutes of Health Stroke Scale (NIHSS) and modified ranking scale (mRS) 0-2.

Methods: We retrospectively reviewed all AIS patients who had stroke activation from September 2019 until May 2020. We received stroke activation from emergency physician during office hours (8am – 5pm). Patient received Intravenous alteplase rt-PA (0.9mg/kg) within 4.5 hours of AIS symptom onset with NIHSS score 6-22. NIHSS were recorded and mRS were evaluated upon discharge and during follow up.

Results: There were total of 41 stroke activations from September 2019 to May 2020. Of these, 7 patients were thrombolysed, 57% were male with median age of 61 years old (IQR 46-67). The median of prethrombolysis NIHSS was 18 (IQR 6-20) with improvement of 4 point (IQR 0.5-5.5) change at 24h postthrombolysis. No patient developed major bleeding and angioedema complications. Inpatient case fatality rate was 14.1%. The Median mRS upon discharge was 4 (IQR 4-5). 5 cases out of 7 cases had been assessed after 3 months with median change in mRS was 2 point improvement (IQR 0-3). 80% achieved favourable outcome (MRS 0-2) at 3 months.

Conclusions: Thrombolytic therapy is effective and safe to be given to AIS patient in non-neurologist hospital with collaboration from multidisciplinary team.

ACUTE STROKE UNIT OF SEBERANG JAYA HOSPITAL – TAKING BABY STEPS

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ABSTRACT

Introduction: Studies have shown that comprehensive and coordinated care delivered by multidisciplinary team in acute stroke unit (ASU) benefit acute stroke patients in many ways. However, it is not widely available in Malaysia. Thus Seberang Jaya Hospital has taken baby steps in starting our ASU service on 11 November 2019 to become a Primary Stroke Centre for northern region of Malaysia.

Objective: We aimed to study the demography, length of stay and key performance index of ASU from 11 November 2019 until 29 February 2020.

Methods: This is a retrospective cross sectional study. Data were extracted from ASU Admission Bundle of all patients whom were admitted to the ASU of Seberang Jaya Hospital, from 11 November 2019 to 29 February 2020.

Results: A total of 127 patients were admitted to ASU during the study period. Two third (62.7%) of them were males and 37.3% were females. Majority were Malays (47.5%), followed by Chinese (34.7%), Indians (11.0%) and foreigners (6.8%). The mean age was 57 years old (SD 12.7 years) and the mean NIHSS was 3 (SD 2.9). Almost all the patients (97.4%) received stroke education from the ASU nurse, 92.4% had swallowing test performed by occupational therapists and 92.7% were seen by physiotherapist before discharged. Average length of stay was 2.25 days.

Conclusion: We hope to expand our ASU service to cover more severe strokes in the future as we train more nurses and doctors in acute stroke care.

DEMOGRAPHIC AND CHARACTERISTICS OF ACUTE STROKE REGISTRY, HOSPITAL SEBERANG JAYA (ASTRO-HSJ)

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ABSTRACT

Introduction: Stroke registry is a valuable tool to gather information on epidemiology and clinical management of stroke patients for benchmarking and to improve patients' care. Department of Emergency and Trauma Hospital Seberang Jaya (ETDHSJ) started our Acute Stroke Registry on 1 January 2019 as we serve as a Primary Stroke Centre for northern region in Malaysia. In this study we aim to provide comprehensive overview of our acute stroke patients.

Method: All acute stroke patients presented to ETDHSJ from 1 January 2019 to 31 December 2019 whom stroke code was activated were included in this study. Data were retrieved from online stroke code registry Google Form and patients' medical record.

Result: A total of 73 stroke codes were activated in the study period. Two third were males (n=50, 68.5%) and 31.5% females (n=23). Racial distribution was Malays (46.6%), Chinese (31.5%), Indians (20.5%) and foreigners (1.4%). Mean age was 58 years old (range 21 to 87 years). Majority (n=70, 95.9%) were acute stroke with known onset within 4.5 hours while 4.1% were wake-up strokes. Most of the patients came to hospital by their own transport (64.7%). The therapeutic yield for thrombolysis was 35.6% (n=26). Among the reasons why thrombolysis were not administered include intracranial bleed (17.8%), low NIHSS (12.3%) and high NIHSS (5.5%). Interestingly, we also found that the stroke onset time peaked at 10:00-10:59am. On average, patients took 1 hour 43 mins (SD 1 hour 10mins) from onset of stroke symptoms to reach hospital.

Conclusion: This data allows us to understand our local community and to strategize patient-centered care and education to combat against this disabling disease.

ASSESSING WHITE MATTER HYPERINTENSITIES AND NEUROCOGNITIVE PROFILE IN APPARENTLY ASYMPTOMATIC INDIVIDUALS USING GRAPHICAL MEASUREMENT ASSESSMENT

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ABSTRACT

Background: White matter hyperintensities (WMHs) are related to both impaired mobility and decreased cognitive functioning. This study utilised contour plot, surface plot, and scatterplot methods to assess the proportion of WMHs and neurocognitive profiles in apparently asymptomatic individuals in a single-center sub-urban population-based cohort in North-East Peninsular Malaysia.

Methods: Sixty subjects were recruited through simple convenience random sampling, from Hospital Universiti Sains Malaysia. An online-based cardio-cerebrovascular risk prediction (QRISK2) was utilized to determine the cardio-cerebrovascular risk for the recruited subjects and underwent 3T MRI brain scan followed by neurocognitive assessment using Wechsler Adult Intelligence Scale (WAIS-IV) for Perceptual Reasoning Index (PRI), Working Memory Index (WMI) and Processing Speed Index (PSI). Data were analyzed using MINITAB and SPSS software through contour plot, surface plot and scatterplot.

Results: Among 60 subjects, 19 of them had WMHs predominantly among elderly subjects. WMHs subjects had lower neurocognitive performance compared to subjects without WMHs, however, the differences were not significant, and the variability of neurocognitive performance among subjects was based on brain region predilections. No significant association between subjects with and without WMHs in neurocognitive profiles and QRISK2 scores appeared to be correlated to the presence of WMHs. Moreover, this study found that in elderly individuals, CSVD may contribute to a decline in neurocognitive performance especially in processing speed. The findings of the research were based on the analysis of contour plot, surface plot, and scatterplot for regression. Results for contour plot and surface plot showed that WMI, PRI, and PSI having significant association and also Block Design, Matrix Reasoning, and Visual Puzzle having a significant association. In addition, the result for the scatterplot method was used to explore the relationship between Digit Span with Letter Number Sequencing and Symbol Search with Coding.

Conclusions: Given that presence of WMHs may also indicate an increased risk of symptomatic cerebrovascular events, thus careful interpretation is required to determine its clinical relevance for the individual subjects. This study concluded that the use of contour plot, surface plot, and scatterplot method can provide a better understanding of a studied variable, by showing the actual relationship and examine the behaviour of the influenced variables in detail through the pattern obtained from the plots.

SURVEY ON POST-STROKE CARE SERVICES AFTER DISCHARGE FROM HOSPITAL TAIPING

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ABSTRACT

Introduction: Stroke is commonly associated with long term morbidity and mortality. Its management should be continuous and involve multiple disciplines. Lack of coordination and integration of services might compromise the care especially after the acute event. Hence, this survey aimed to study the quality of care received by stroke survivors.

Methods: Cross sectional study using phone interview method was performed on stroke cases which were discharged between 1/10/2019 and 31/12/2019 in Hospital Taiping. Survey was performed at least 8 weeks after discharge with the aim to assess patients during the transitional period between hospital and health clinics.

Results: 81 cases were called and 55 subjects (67.9%) responded. The mean age of patients was 63, ranging from 30 to 90. Male patients consisted 52.7% while female 47.3%. The majority of respondents consisted of caregivers while only 4 respondents were patients. 10% of respondents were not satisfied with the education on the disease they received while patients were hospitalised. 4 had inadequate medication supplied and 5 were confused with the medication regimen. 34.5% of cases had no follow-up appointment for physiotherapy or occupational therapy, mainly because no referral was provided. 21 cases (38.2%) had sought for health care attention earlier than their outpatient appointments. It was due to various reasons such as infection, fall and somatic pain. There were also 5 cases which experienced loss to follow-up due to logistic difficulties.

Conclusion: In order to improve the quality of care, interventions targeting service delivery at different levels should be planned and coordinated. We propose to strengthen pre-discharge planning and post-discharge monitoring.

EXPLORING THE UTILIZATION OF ANIMAL-ASSISTED INTERVENTION FOR INDIVIDUALS UNDERGOING INPATIENT STROKE REHABILITATION

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ABSTRACT

Introduction: Animal-assisted interventions (AAI) is defined as therapeutic modalities which engage animals to improve the physical, emotional, cognitive, and social functioning of humans. AAI are classified into animal-assisted activities (AAA), animal-assisted therapy (AAT) and service animal programs (SAP). AAI are typically used as an adjunct to standard rehabilitation interventions. The utilization of AAI for clinical indications to improve outcome has gained recognition and momentum; but more evidence is required to determine its effectiveness.

Objective: Single-centre illustrative report to demonstrate the narrated benefits of AAI for individuals undergoing inpatient stroke rehabilitation.

Method (llustrative Report): The AAI session was designed in tandem with the goal of providing environmental enrichment to the inpatient rehabilitation setting. Motor skill, tactile, neglect, communications skills and mood optimization were main therapeutic targets. Pre-AAI planning stage involved developing safety and infection control measures. Criteria and consent for participation in AAI was clearly outlined. Appropriate animals were screened to determine suitability for the animal-assisted activities with patients. Small mammals and colourful avians were chosen to enhance motor skills including stroking, lifting, feeding while simultaneously providing visual, tactile, and auditory stimulation. All patients consented to voluntary participations. Narrative responses were obtained via interview and video-recording.

Results: There was an overall positive response in favour of utilizing AAI as an adjunct to inpatient rehabilitation program. Narrative response showed high level of acceptance. Majority of participants proposed for regular and structured AAI sessions. No infection was reported post AAI sessions.

Conclusion: It is feasible to organize AAI in the inpatient hospital setting as potential adjunct to structured stroke rehabilitation. High-quality prospective studies are necessary to capture its clinical benefit in rehabilitation practice. Future recommendations include determinants of the effectiveness of AAI, and to explore the facilitators and potential barriers of incorporating AAI as adjuncts to standard rehabilitation.

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INCIDENCE RATE OF DEVELOPING FIRST EVER STROKE OVER A 5-YEAR PERIOD

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ABSTRACT

Introduction: Stroke is a life changing event causing a wide range of impairments, death and increased healthcare costs. The incidence rate of first ever stroke in older Malaysians is not well studied. This information is vital to enable service planning for acute treatment, rehabilitation, community facilities and stroke prevention strategies. This study aims to determine the incidence of first ever stroke in older urban Malaysians.

Method: The participants were from the Malaysian Elders Longitudinal Research Study. Individuals aged ≥55 residing in the urban area of Klang Valley were recruited. Of 1670 baseline participants, 888 with no history of stroke were followed up for 5-years through phone calls and included in this analysis. Participants were asked if they had a stroke in the past 5 years, with the date of diagnosis recorded. Incidence rates per 100,000 persons per year was calculated.

Result: Thirteen of 888 (1.5%) participants with mean (SD) age of 68.33 (7.20) years (76.9% male) had a first ever stroke in the 5 years period at follow up telephone call. The incidence rates per 100,000 per year for a first ever stroke in a 5-year period was 294. Individuals aged between 60 to 64 had the highest incidence rate of 396/100,000 persons per year. Those within the 70-74 age group had the lowest incidence rate. Men showed a higher incidence rate with almost 5 times the incidence rate of women.

Conclusion: This study shows the incidence rate of first ever stroke in urban older Malaysians. We were able to determine the characteristics of those with the highest incidence rates. This can help with targeted public health strategies of stroke prevention and planning of stroke services.

POST-STROKE APHASIA REHABILITATION IN MALAYSIA: FINDINGS FROM A SURVEY WITH SPEECH-LANGUAGE PATHOLOGISTS

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ABSTRACT

Introduction: Stroke is the third leading cause of death and disability in Malaysia, contributing to a growing population in need of post-stroke aphasia rehabilitation. To date, the SLP services for this population has been largely unexplored. This study aimed to obtain SLPs' perspectives regarding SLP services for people with post-stroke aphasia in Malaysia with respect to: 1) current management practices; 2) barriers and facilitators to service provision; and 3) clinical and research priorities.

Methods: Convenience and snowball sampling were used to recruit participants via professional networks. Ninety-two SLPs who were currently providing services to people with post-stroke aphasia contributed to the survey. Questions were based on previous survey research that explored aphasia management in other countries. Quantitative data were analysed using descriptive statistics and qualitative data using conventional qualitative content analysis.

Results: The majority of SLPs were employed in a government-funded institution (61%) and provided aphasia services within an outpatient rehabilitation setting (60%). All SLPs reported speaking two or more languages and provided bilingual or multilingual SLP sessions. Common practices reported by the SLPs included commencing management more than one week after receiving the initial referral (48%), using non-standardised tools for screening (90%) and assessment (90%), as well as providing monthly to quarterly intervention sessions (50%). Across the continuum of care, SLPs identified the main barriers and facilitators to optimal aphasia rehabilitation related to SLP's capacity, consumers' awareness and commitment, and the availability of locally relevant resources. SLPs identified clinical and research priorities included the need for local evidence and resources.

Conclusion: SLPs in Malaysia reported similar practices to SLPs working in other countries, particularly countries with emerging aphasia rehabilitation services. There is a need to improve the provision of post-stroke aphasia rehabilitation and encourage further research. The findings are relevant for informing SLP practice in countries with emerging aphasia rehabilitation services and multilingual populations.

NEUROPROTECTIVE EFFECT OF NANOPARTICLE-BOUNDED BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) ON EXPERIMENTAL HAEMORRHAGIC STROKE IN RATS

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ABSTRACT

Introduction: Brain-derived neurotrophic factor (BDNF) plays an important role in brain plasticity and repair while nanoparticle (NPs) poly (lactic-co-glycolic acid) (PLGA) has been proven either in-vivo or in-vitro as potential carriers for drugs across the BBB, with advantages of enhanced drug efficiency and safety. This study was aimed to investigate the neuroprotective effect of BDNF-PLGA nanoparticles on experimental haemorrhagic stroke (HS) in rats

Methodology: Sprague-Dawley rats were divided into 6 groups; group 1, sham operation while group 2 to 6 were induced with HS. 15 minutes after induced, all groups were treated with respective formulations intravenously: groups 1 and 2 were treated with saline; group 3 was treated with empty PLGA NPs; group 4 with PLGA NPs coated with surfactant; group 5 with BDNF-loaded PLGA NPs and group 6 with BDNF-loaded PLGA NPs coated with surfactant. Behavioural assessments were performed after treatment on days 1, 3 and 7. On day 7, rats were sacrificed and brain was taken for histological and immunohistochemical analysis.

Results: Caspase-3 staining showed that treatment with BDNF-loaded PLGA NPs exhibited significant lower in apoptosis compared with other HS groups. Groups 2, 3 and 4 demonstrated a significant increase in glial cells when compared to BDNF treated groups. Rats treated with BDNF-loaded PLGA NPs also exhibited low expression of synaptophysin. Open field test showed that treatment with BDNF-loaded PLGA NPs produced high score in rearing and total distance travelled indicating improvement in locomotor activity. BDNF NPs treated group showed improved rotarod performance indicating improvement in their motor learning and coordination. Rats treated with BDNF-loaded PLGA NPs also exhibited increased grip strength as evidence of motor neuroprotection.

Conclusion: BDNF-loaded PLGA NPs has neuroprotective effect on experimental haemorrhagic stroke in rats.

ADENOSINE A1 RECEPTOR PLAYS ROLE IN NEUROPROTECTION BY RESVERATROL AGAINST NEUROBEHAVIOURAL DEFICITS IN RAT MODEL OF HEMORRHAGIC STROKE

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ABSTRACT

Introduction: Stroke, a common cause of brain injury, contributes to significant morbidity and mortality worldwide. Intracerebral hemorrhage (ICH) remains the least treatable stroke subtype without a definitive therapy. Current evidences suggest an important role of adenosine receptors in the modulation of sensorimotor pathways which might offer a new target for neuroprotective strategy. This study was aimed to investigate involvement of adenosine A1 receptor (A1R) in the mechanism of neuroprotection by resveratrol in animal model of ICH.

Methods: Sixty male Sprague Dawley rats were divided into five groups: (i) control, (ii) sham, (iii) vehicle (0.1% DMSO saline), (iv) trans-resveratrol (4 nmol) and (v) trans-resveratrol (4 nmol) with A1R antagonist, DPCPX (8 nmol). Pre-treatments (groups iii-v) were given through intracerebroventricular injection. Thirty minutes after pre-treatment, ICH was induced using collagenase through intrastriatal injection. Forty-eight hours after ICH, the rats were assessed using a variety of neurobehavioural tests such as neurological severity score, tail flick, open field, grip strength and rotarod tests. After that, rats were euthanized, and the brains were subjected to gross morphometry and histological observations. Coronal sections of brain tissue were stained with haematoxylin & eosin, and immunohistochemistry was done using antibody to neuronal nuclear-specific protein and oligodendrocyte-specific protein.

Results: Severe neurobehavioural deficits and hematoma with diffuse oedema were observed in ICH rats. Pre-treatment with resveratrol partially preserved neurobehavioural functions that was accompanied by reduction of hematoma volume by 73.22% ($p<0.05$), damaged area by 60.77% ($p<0.05$), and striatal neuron depletion by 36.30% ($p<0.05$). Resveratrol pre-treatment increased survival rate among ICH rats by 27.70% ($p<0.05$). The resveratrol-induced restoration in survival rate, neurobehavioural outcomes, damaged area and neuronal density were abolished by administration of DPCPX.

Conclusion: This study demonstrates involvement of adenosine A1 receptor in the underlying mechanism of neuroprotection in ICH rats by resveratrol.

CATHETER DIRECTED PULMONARY ARTERY THROMBOLYSIS IN A COVID-19 POSITIVE PATIENT WITH MASSIVE PULMONARY EMBOLISM: CASE MANAGEMENT AND ENDOVASCULAR SUITE WORKFLOW IN A PANDEMIC

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ABSTRACT
Thromboembolic complications are common amongst cases of COVID-19 infections. This occurrence has seen a key role of endovascular treatment in the management of this potentially fatal complication. Endovascular thrombectomy or catheter directed thrombolysis is a fast and effective method for treatment of pulmonary embolisms, especially in a pandemic. We describe a case of COVD-19 complicated with massive pulmonary embolism treated with catheter directed thrombolysis-discussing case management, patient workflow and safety measures that should be strictly adhered to ensure a favorable outcome and ensure safety of treating personnel.

Keywords: COVID-19, pulmonary embolism, catheter directed thrombolysis

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1. INTRODUCTION

The COVID-19 infection is causing a large strain on the healthcare system worldwide. Total deaths from the disease till April 2020 were over a quarter million individuals[1]. High-risk groups include old age, those with underlying co-morbid disease and immunosuppression. Complications in COVID-19 infection include respiratory failure, pneumonia, acute respiratory distress syndrome as well as thromboembolic disease[2]. Of these complications, massive/sub-massive pulmonary embolisms is a potentially fatal sequelae in cases of COVID-19 [3], [4].

Endovascular treatment for cases of COVID-19 is crucial in the management of thromboembolic complications[5]. Endovascular approach to treatment and prevention of pulmonary venous thromboembolic complications is more feasible as opposed to open surgery in a pandemic. We report a case of catheter directed thrombolysis for a massive pulmonary embolism in a COVID-19 positive patient and discuss the treatment, outcome and workflow process in an endovascular suite.

2. CLINICAL HISTORY

A 71years old gentleman presented to the emergency department with a history of non-productive cough for 1 week prior to admission. His admission physical examination revealed stable vital signs with no evidence of fever or rapid breathing. His lung examination showed equal air entry with no abnormal breath sounds. His COVID-19 PCR swab was positive from a screening of an infected community cluster and he was classified as COVID-19 clinical stage 2A[6]. He had multiple comorbidities that included type 2 diabetes on subcutaneous insulin and single oral hypoglycemic agent, hypertension on dual antihypertensives and ischemic heart disease with a previous history of a coronary bypass in 2014. On day 2 of admission, he developed a temperature of 38 degrees but had no respiratory symptoms, escalating him to clinical stage 2B. He subsequently had breathing difficulties on day 3 of admission that required supplemental oxygenation. Clinical examination showed lung crepitations on auscultation with deranged blood gas, thus escalating him to clinical stage 4A.

However, at day 5 of admission, his blood oxygenation deteriorated further requiring invasive oxygen therapy and thus was intubated. Chest radiograph showed worsening lung infiltrates. A CT Pulmonary Angiography was performed at day 14 and revealed bilateral pulmonary embolism involving the main pulmonary trunks (right > left) with an enlarged right ventricle (Figure 1).

Due to the presence of massive pulmonary embolism, the decision was made to proceed with a catheter directed pulmonary embolectomy. A transfemoral venous access was used. Under ultrasound guidance, a 5 Fr x 10cm arterial sheath (Terumo Inc) was inserted into the right femoral vein. Using a 0.035" x 150 cm Glidewire (Terumo Inc), a 5Fr Sim2 (Cordis Inc) was guided into the main pulmonary trunk. Subsequently, the glidewire was exchanged out with a 0.035" x 300cm Amplatz super stiff guidewire (Cook Inc) and the Sim2 catheter was exchanged with a 5Fr Pigtail tip catheter (Cordis Inc).

A pulmonary angiogram was performed and demonstrated a large significant clot in the right main pulmonary artery with non-opacification of the right middle lobe branch (Figure 2a). Post angiography, the pigtail catheter was then advanced into the right pulmonary artery clot and the clot laced with 5mg r-TPA over 5 minutes. Subsequently, the pigtail was parked within the proximal aspect of the right main pulmonary artery clot and an r-TPA infusion of 1mg per hour was given over 24 hours.

Twenty-four hours post infusion, a repeat pulmonary angiogram showed significant reduction in clot burden within residual clot in the upper lobe pulmonary arterial branch (Figure 2b). No further bolus or infusions of r-TPA were given.

There was a transient improvement in the oxygenation in days following the procedure. However, the parenchymal disease from the COVID-19 infection had caused further lung failure. The patient finally succumbed to the illness after day 26 of admission. The cause of death was labelled as acute respiratory distress syndrome due to pneumonia due to COVID-19.

3. DISCUSSION

In the wake of the COVID-19 pandemic in 2020, every discipline has required to adjust and modify their daily practices in patient management. Patients would need to be managed on a case to case basis with a multidisciplinary decision and approach. As much as patient safety is the primary concern in treatment, today we need to address physician safety as a major highlight to case management. This is especially true in the surgical and endovascular based setting- where there are potential prolonged periods of multi personnel exposure in a confined space. Therefore, specific workflows and strategies are required to ensure the necessary safety measures are taken.

Case management approach

The risk of thromboembolic disease has shown to be increased in cases with COVID-19. Like in most large tertiary facilities, the option for surgical/endovascular management of pulmonary embolism is feasible to reduce mortality[7]. In this case, there was a massive pulmonary embolism with significant clot burden causing hypotension (requiring inotropic support), poor oxygenation and right heart strain.

Endovascular options for treatment in sub massive or massive pulmonary embolism are either catheter thrombectomy or catheter directed thrombolysis[5]. In our scenario, we opted for a catheter directed thrombolysis as we did not have suitable equipment for a catheter thrombectomy. This approach is a little unconventional as the patient would need a procedure done twice, 24-hours apart. This approach doubles the risk of exposure to personnel involved. However, the advantage of a catheter directed thrombolysis is a relative short procedural time- as there is less time spent in directing catheters to individual branches and repeated passes for clot retrieval.

In our case, a femoral venous approach is superior to a jugular approach as the operator would be further away from the potential source of an airborne infection. The use of a long sheath does facilitate easy repeated access especially in cases of a thrombectomy but was not used in our patient. There was significant reduction in clot burden on angiographic images 24 hours apart indicating success in clot lysis.

Angiographic workflow and room preparation

Most large infectious disease centers should have designated angiographic suites able to deal with potential epidemics. Negative pressure rooms with hepa-filters are critical to ensure a safe working environment for involved personnel. Having an airlock room or a double door access to the endovascular suite is advantageous. All non-essential mobile equipment should be removed prior to a case. Any equipment that cannot be removed (i.e. fixed cabinets, monitors, injectors) as well as parts of the angiographic/ anesthetic equipment should be covered in easy to remove plastic wraps. Clearly marked pathways with minimal or no contact with non-essential individuals should be visible to ensure fast and safe patient transport.

Cases are best to be deferred to a time whereby there are minimum staff within the units. The bare minimum workforce required for the case should be present in the endovascular suite to reduce potential exposure. All personnel in the suite are required to wear Personal Protective Equipment (PPE) as pertaining to recommendations for management of airborne droplet disease[8]. Some institutions may have the luxury of a Power Air Purifying Respirator (PAPR) for use and is recommended when performing procedures that can potentially aerosolize droplets.

A member of staff that is deemed 'clean personnel' is present outside the room (usually in the control room) and able to visualize the case through a glass panel. This 'clean personnel' will be able to trouble shoot and post process angiographic images throughout the case. He/she will also serve as a runner to provide any further equipment needed by the treating team via an airlock room/ dual entry point clean room.

After donning the required PPEs, the anesthetic team is informed and the case is brought to the endovascular suite. In our institution, there are 2-3 individuals who are involved in patient transport. In some centers, patient transport is done in a surgical isolation bubble transport. The endovascular suite remains closed off throughout the case. The receiving team should be geared and ready to receive the patient and help set up the individual monitors, tubes and etc. to minimize time in the endovascular suite.

During the procedure, any attempt to reintubate, or readjust the endotracheal tube should be done so with caution as the droplets could potentially aerosolize and may be harmful in endovascular suites not equipped with negative pressure. The angiography suite manager should have

discussions with the engineering teams to ensure the safety of performing aerosolized procedures in the room.

Once the case is completed, the patient is transported back to the ward and the terminal cleaning process is done. Thorough wipe down of all plastic surfaces are required with germicidal wipes that cover viruses. Non-alcohol based germicidal wipes are used for the ultrasound probes to protect the detector surface. All previous plastics covering equipment should be removed slowly and in a careful manner as to avoid any aerosolization of potential droplets on its surface and discarded. After removal, these surfaces should also be wiped down with germicidal wipes. Post terminal cleaning, the room is treated with an Ultra-violet light for 4-6 hours to kill any potential virus on surfaces not able to be cleaned (i.e. crevices, monitors etc.).

All staff involved in the case should then perform doffing and proceed to take a shower and discard all clothes. Lead-gowns should be given a wipe down with suitable germicidal wipes. Image post processing and data management should be done by the 'clean personnel'.

Staff should monitor themselves for the next 2 weeks to ensure no symptoms of fever or upper respiratory tract infection that may alert to a potential early infection. If present, they should immediately be screened, seek treatment and isolate.

4. CONCLUSION

Endovascular treatment of pulmonary embolism is a good option of treatment for thromboembolic complications associated with COVID-19 disease provided there are good workflows, physician and patient safety adherence as well as cleaning protocols to prevent contamination.

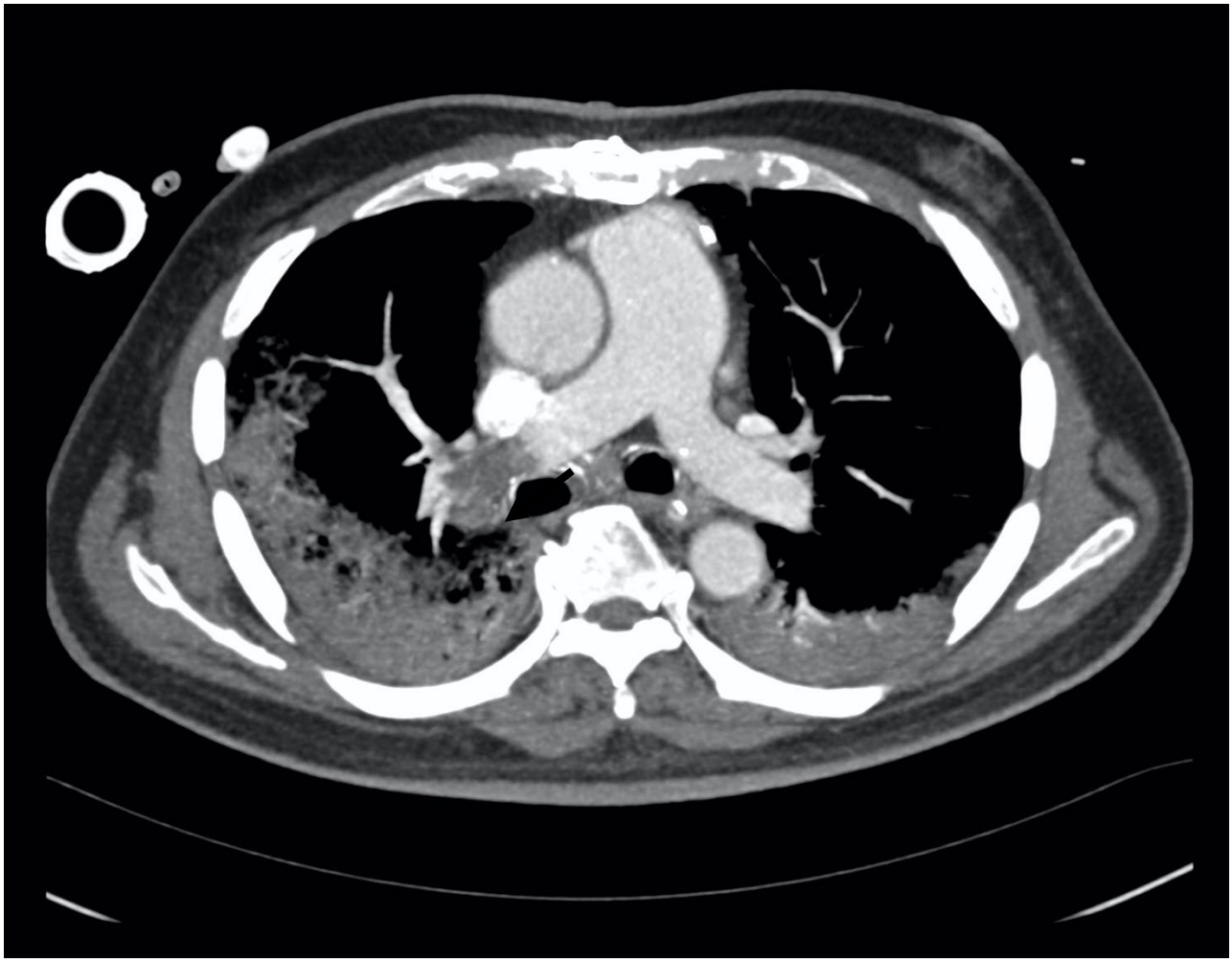

Figure 1: CT Pulmonary angiography shows large clot burden in right main pulmonary artery (black arrow) with underlying bilateral posterior and lower lobe consolidations. Clot in distal left pulmonary artery not seen here.

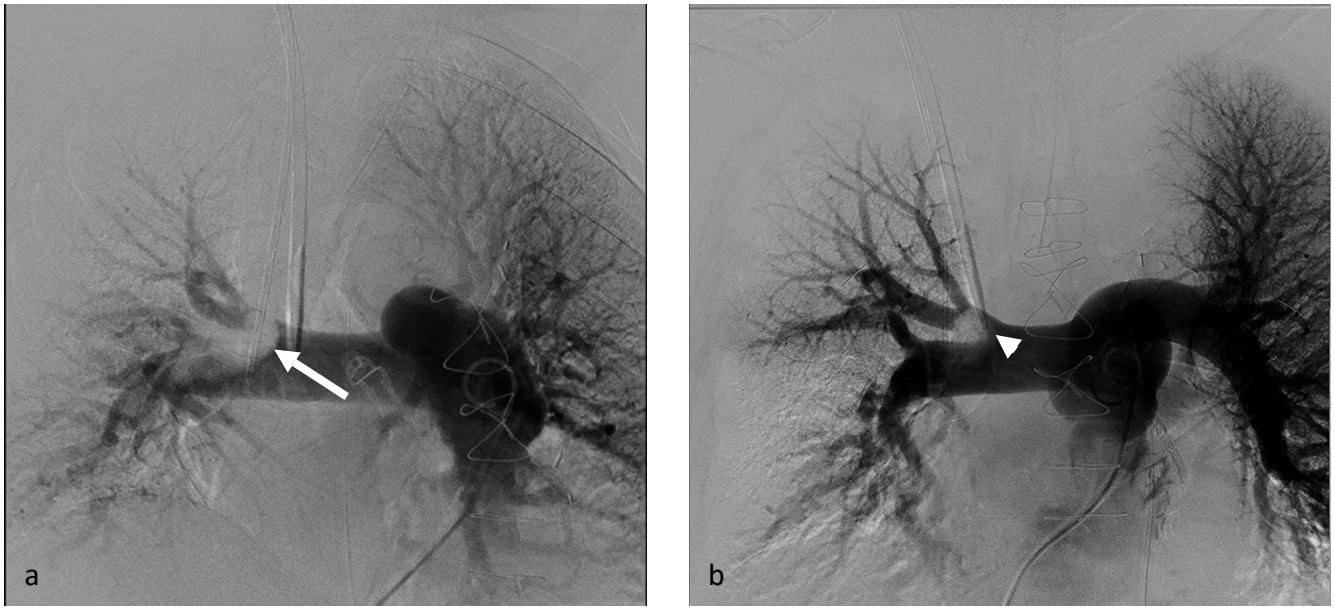

Figure 2a and 2b: Pulmonary angiograms with large filling defect in the right main pulmonary artery (white arrow). 24 hours post thrombolysis the clot has resolved with minimal residual clot in the right upper lobe (white arrowhead).

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