COVID-19, Infections and Stroke

A Comparative Time Matched Hospital Based Study of First Ever Stroke Patients Admitted To Stroke Unit During Pre-covid 19 Vs Covid 19 Pandemic Era

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Aim: To study effects of COVID 19 pandemic era on demographics, type and severity of strokes, morbidity & mortality among patients having first ever stroke who were admitted to stroke unit during similar months(April & May) in year 2019 & 2020. To study the effects of COVID 19 pandemic era on diagnosis of minor strokes and utilization of imaging modalities(MRI/NCCT).

Methods: The study was conducted at GMC Kota, a tertiary care hospital in Rajasthan. All patients having their first ever stroke and admitted to our stroke unit during the pre-COVID 19 period (April 2019-May 2019) and the COVID 19 period (April 2020-May 2020) were considered. The characteristics of stroke, the severity, the number of admissions per day, and demographic characteristics as well as the short-term outcomes were studied.

Results: Of the 108 patients included, 44 (40.7%) presented during the COVID-19 period. There was a 36% reduction in first-ever stroke diagnoses from (1.05/day) to (0.72/day) ($p<0.0001$). The admitted patients were five years older and in much worse health than in the pre-COVID 19 era ($p<0.0001$). There was a statistically significant reduction in MRI use by 27% ($p=0.055$).

Conclusion: The observation suggests an overall reduced number of stroke admissions per day. Patients admitted were older and more severely ill. In COVID 19 era patients, mortality and mRS at admission and discharge were higher, along with a longer hospital stay. An overall reduction in the utilization of MRI was observed due to COVID protocol.

COVID-19, Infections and Stroke

COVID 19 and Stroke Trends in A Tertiary Care Centre from South India - Our Monsoon Experience

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Background: Acute stroke is an emergency with high mortality and morbidity requiring timely treatment in the golden hours. Preliminary reports showed a delay in the arrival of acute stroke patients to the emergency room during the COVID -19 pandemic. There is a concern that COVID-19 co-infection can adversely affect stroke outcome.

Aim: We plan a study to investigate the impact of COVID in the management of stroke patients. We also compared the differences in stroke manifestations, etiological pattern, treatment course and outcome of acute stroke patients in COVID 19 confirmed cases.

Methods: A single centre retrospective study was done at Stroke unit, Government Medical College, Thiruvananthapuram. Consecutive patients of acute stroke confirmed by imaging, presenting within 24 hours of the onset of symptoms in July 2020 and July 2019. The primary data variables included baseline demographics, risk factors, admission NIHSS, stroke timings, thrombolysis rate, TOAST aetiology, mRS at discharge and in-hospital mortality.

Results: Elderly patients, large vessel occlusions, haemorrhagic strokes, delay in symptom to door, door to CT, and door to needle were more during the pandemic. Intravenous thrombolysis was less and mortality higher during the pandemic. Male predominance, more haemorrhagic strokes, more severe strokes with higher NIHSS, higher mRS and high in-hospital mortality were seen among COVID-19positive patients.

Conclusion: Our study was a hypothesis-generating study with a limited number of patients. The study has reconfirmed the higher severity of the stroke, higher mRS score and mortality during the pandemic and among COVID 19 positive stroke patients.

COVID-19, Infections and Stroke

Influence of the COVID-19 Pandemic on Sleep Quality and Patterns in Community- Dwelling Stroke Survivors in Singapore

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Background: Sleep has been established as a primary factor that influences recovery and recurrence rates after stroke. However, there is a paucity of sleep data on stroke survivors in Singapore.

Aim: The aim of the study was to determine the quality and patterns of sleep in Singaporean community-dwelling stroke survivors before and during the COVID-19 pandemic.

Methods: A series of questionnaires were conducted online between July 2020 to February 2021. Community-dwelling stroke survivors in Singapore were recruited and completed the study. Patterns of PA and sedentary behaviour were assessed using the Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI).

Results: A total of 56 stroke survivors completed the study (mean age (SD) 60.1 (12.8) years, 28 males). In a typical week, stroke survivors in Singapore managed with 7.93 hours of sleep before the COVID-19 pandemic, and 7.88 hours of sleep during the COVID-19 pandemic. Despite getting the recommended amount of sleep, stroke survivors' sleep quality was poor both before the COVID-19 pandemic (5.27±3.32) and during the COVID-19 pandemic (5.57±3.65).

Conclusion: Community-dwelling stroke survivors in Singapore have poor sleep quality before and during the COVID-19 pandemic. Further research is required to determine if improved sleep patterns can lead to better stroke outcomes and recurrence rates.

COVID-19, Infections and Stroke

Stroke Thrombolysis During the Pandemic - "A Tale of Two Waves"

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Background: The call to arms, during the pandemic, was answered by every branch of medicine, each fighting separate wars. The war we "Neurologists" faced was the "Battle for the Vessels". Each neurologist needed to be armed well. Health care workers themselves are a priceless commodity in many Low-Middle Income countries. Exposure to a covid-positive patient for a "full hour" during thrombolysis may not be warranted.

Aim: Hence Tenecteplase, which fits the bill "ideally" and "literally" was analysed in this study for its effectiveness against alteplase in strokes with covid-positivity.

Methods: This is an ambi-spective observational study of 37 patients in an apex tertiary-care centre in India. Routine stroke variables were assessed including follow up imaging, functional outcomes at 3 months. The results were also analysed with the thrombolysis data from covid negative individuals too in the same period.

Results: Among the covid-positive patients 62.16% patients received tenecteplase while 37.83% received alteplase. Although the baseline characteristics were similar in the two groups, the time-metrics for thrombolysis were significantly favourable in the tenecteplase arm. The median hospital stay was shorter in the tenecteplase group as was the in-hospital mortality. On follow up at the end of 3 months too the median mRS score was significantly favourable in the tenecteplase group.

Conclusion: Thrombolysis during the pandemic has been a real challenge in many ways especially in resource limited settings. This study shows that there needs to be a conscious and judicial transition towards tenecteplase during the pandemic, where healthcare workers are a precious resource too.

COVID-19, Infections and Stroke

NG Adolescents Aged Between 10 - Intetrnal Carotid Artery Occlusion in Young Adolescents Aged Between 10-19 Years with Dedenovo Detected Type 1 Diabetes Mellitus with Mucormycosis

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Background: Rhinocerebral mucormycosis infrequently occurs in young adolescent population, and when it involves thrombosis of an internal carotid artery, it has been almost uniformly fatal.

Aim: To illustrate rapid diagnosis and aggressive treatment of rhinocerebral mucormycosis with internal carotid artery occlusion in young adolescents aged between 10-19 years with newly detected type 1 diabetes mellitus and some complicated by diabetic ketoacidosis to prevent mortality and significant morbidity.

Results: In this case series we have documented 30 cases of young adolescents aged between 10-19 years admitted from May 2021 to July 2021 at government Rajaji Hospital Madurai with varied presentation from being asymptomatic, upper respiratory tract infection, urinary tract infection, gastroenteritis to cavernous sinus thrombosis to vision loss, stroke etc who were detected to have denovo type 1 diabetes mellitus and some with diabetic ketoacidosis while being evaluated for COVID 19 infection. Patients were then treated intensively with strict blood sugar control, liposomal amphotericin B, posaconazole to aggressive surgical debridement.

Conclusion: This case series illustrates the importance of prompt recognition and aggressive treatment of fungal infection in patients with COVID 19 in young adolescents with newly detected type 1 diabetes mellitus and diabetic ketoacidosis. Additionally, it emphasizes the early such treatment have an excellent outcome if detected and intervened early and aggressively and thus the mortality and significant morbidity can be avoided.

COVID-19, Infections and Stroke

Neurological Complications of Covid-19 Among Hospitalized Patients of Selected Hospitals of Udupi District, Karnataka

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Background: COVID-19 is well known for causing severe respiratory problems, but it can also cause a wide variety of extrapulmonary ailments, of which neurological manifestations are being recognised increasingly. Among the various neurological complications, stroke has been seen as a minor but clinically significant manifestation of COVID-19.

Aim: The study aims to overview the neurological complications primarily focussing on stroke cases associated with COVID-19.

Methods: The data of 1858 laboratory-confirmed patients with COVID-19 were screened retrospectively from the medical records section, of which 318 (17.11%) were found to have neurological manifestations during the hospital stay. Clinical and demographic details of the eligible patients were recorded.

Results: The mean (SD) age of the eligible patients was 49±17.03 years (n = 318) and the sex ratio (male to a female) of 1.50 was noted. CNS, PNS and subjective symptoms (insomnia, paraesthesia, headache, dizziness) were present in 34 (10.7), 178 (56.2) and 132 (41.6) patients respectively. Stroke was reported in 11(3.45) patients with mean age 62.6±17.07, of which 8(2.5) had Ischemic and 3 (0.9) had a haemorrhagic stroke. Death was reported in 5 (62.5) ischemic stroke patients and 1(33.3) haemorrhagic stroke patient.

Conclusion: COVID-19 has the potential to invade the neurological system, eliciting a plethora of neurological manifestations. The spectrum of neurological manifestations are wide. Stroke is a serious manifestation precipitated by covid with high mortality.

COVID-19, Infections and Stroke

Strokes with COVID Infection

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Background: Covid 19 pandemic was one the deadliest pandemic faced by mankind. It completely took the world by storm and posed a huge challenge to the healthcare systems all around the world. This virus causes *primarily a respiratory illness*, however, there is increasing evidence for various neurological complications associated with this infection. Common neurological problems include anosmia, which seems to be the heralding feature in many patients with COVID- 19 infection, headaches, dizziness, seizures and altered mental status. Strokes, both thrombotic and haemorrhagic, are being recognised in many patients with active COVID infection. Similarly, immune mediated late response with necrotising encephalitis, myositis, myelitis and neuropathies can be seen up to 6 weeks' post- infection,

Methods: In our hospital, we saw many patients treated for Covid with secondary neurological complications especially coagulopathy related complications, manifesting as both thrombotic and haemorrhagic strokes. Some of these patients presented to the hospital with strokes and then found to be covid positive.

Results: The strokes that we saw were not just water shed infarcts but also large vessel thrombosis. A small proportion of patients had intra-parenchymal bleed and sub-arachnoid bleed. There were also patients with cortico-venous thrombosis (CVT). The treatment of these patients was challenging as we needed to follow isolation protocols and yet deliver both acute care and rehabilitation. Patients eligible for acute intervention did get thrombolysed in time. Stroke associated complications were more than usual as some of these patients were very sick from their primary pulmonary involvement. This also delayed rehabilitation post-stroke.

Conclusion: We developed unique stroke management protocol for Covid positive patients and strict adherence to this did benefit many patients.

COVID-19, Infections and Stroke

Anticoagulants Usage in Cerebral Venous Sinuses Thrombosis Prevention Among Patients with Severe COVID-19

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Aim: To determine more safe and effective anticoagulant in venous stroke prevention among patients with severe COVID19.

Methods: Totally 630 patients participated in the study. All patients got treatment based on national COVID19 guideline at the Akfa Medline MC in the period of November, 2020 up to August, 2021. Criteria for severe COVID19 were following: SpO2 <92% on room air, PaO2/FiO2<300 mmHg, respiratory frequency >30 breaths per minute, lung infiltrates >50% on CT. Eight patients died till to recheck time. 3 patients didn't manage to come for recheck. Therefore, finally 509 patients are included in the study and divided into three groups. First group of patients got Heparin in dosage 24000 –36000 IU per day. Second group took Enoxaparin 1mg/kgBM/day. Third group - Rivaroxaban 20 mg per day. Follow up done on 2nd-3rd-4th-5th-6th week after start of treatment. Brain MRI done when there was severe headache or focal neurologic deficit.

Results: All groups of patients had comparable demographic data.

Anticoagulant	Heparin (n=230)	Enoxaparine (n=215)	Rivaroxaban (n=185)
CVST13	(5.65%)	2 (0.93%)	1 (0.54%)

Conclusion: Cerebral Venous Sinuses thrombosis prevalence is significantly higher in patients getting Heparin ($p \leq 0,05$). Enoxaparine and Rivaroxabane showed their safety and effectiveness in venous stroke prevention in severe COVID19

Epidemiology

Investigating the Prevalence of Macrovascular and Microvascular Complications Among Diabetic Patients

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Background: Diabetes is one of the non-communicable disease that attributed to more than 70% death in Malaysia. 1 in 5 adults in Malaysia are diabetic and 1 in 2 adults are obese. The information on the complications of diabetic in Malaysia is scarce and some of the reports are not published.

Aim: Our research aimed to investigate the complications among uncontrolled diabetic patients seen in Diabetes Mellitus Medication Therapy Adherence Clinic (DMTAC).

Methods: A cross-sectional study using an established clinical registry was conducted from 1 January 2019 to 31 December 2019 at Serdang Hospital. The complications reported on the first point of contact with DMTAC pharmacist were analysed among uncontrolled diabetic patients. Inclusion criteria include Type 2 Diabetes Mellitus patients and exclusion include less than 18 years old, incomplete data, pregnant and gestational diabetes mellitus patients.

Results: A total of 495 patients with mean HbA1c of 10.5% were included in the study. Out of 491 patients, 91% of these patients are obese/overweight. 37.8% of diabetic patients fall within 50-59 age bracket and 59% has been diagnosed with diabetes for less than 10 years. 8.4% and 9.6% consume alcohol and smoke respectively. 29.8% has 2 comorbidities (either diabetes with hypertension and dyslipidemia) and 63.4% has all 3 comorbidities. 18.9% had a history of myocardial infarction, 11.1% had a history of stroke and 9% were CKD patients.

Conclusion: By understanding the current pattern of diabetes and the comorbidities, it is hoped that a tailored and targeted public education can be done so that effective intervention can be carried out to negate these complications.

Epidemiology

Prevalence of Recurrent Ischemic Stroke and Association of Risk Factors in KCMH

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Background: Stroke is the leading cause of death and disease burden in Thailand. Functional outcomes and post-stroke complications are worse in the recurrence. Thus, recurrent stroke risk factors should be studied.

Aim: To investigate the prevalence of recurrent stroke (the second episode) in a one-year follow up period at the stroke unit, King Chulalongkorn Memorial Hospital (KCMH) and to study risk factors associated with recurrence.

Methods: This retrospective cohort study included all patients (>18 years old) admitted with the first episode of ischemic stroke in 2019. Patients diagnosed with transient ischemic attack or with recurrence in KCMH were excluded. Patients who met inclusion criteria were followed up until the recurrence occurred within 1 year. Associations of risk factors and recurrence were determined by Cox-proportional hazard ratio.

Results: There were 736 patients with acute ischemic stroke who were admitted in KCMH during 2019. We included 418 patients who developed the first episode, recurrence occurred in 26 patients. Prevalence of recurrence was 6.2%, with incidence rate of 0.079 person-year and 61.61 person-day as mean recurrence duration. From 52 patients who had atrial fibrillation, none developed recurrence stroke. The Cox-proportional hazard ratio elicited that treatment of dyslipidemia was considered a protective factor of recurrent ischemic stroke with HR 0.37 (95% confidence interval [CI] = 0.15 - 0.88, p = 0.025).

Conclusion: The prevalence of recurrence was 6.2%. Our study indicates that well-treated dyslipidemia has an association with recurrent ischemia

Epidemiology

Study of Interplay of Atrial Fibrillation- Clinico - Radiological - Prognostication Profile of Cerebrovascular Accident

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Background: BLAST FROM THE PAST–"Cryptic strokes" in the past are increasingly being attributed to the sine qua non-atrial fibrillation. Atrial fibrillation(AF) quintuples the risk of stroke. Also once stroke occurs, autonomic changes and post-stroke inflammation may transiently increase AF risk.

Aim: Determine influence of AF in causation of different types of stroke and their prognosis

Methods: Observational study on 200 stroke patients between January to September 2021.Each type of stroke and AF were further analysed. NIHSS, KATZ and MRS score were used at admission and 30 days follow up. Recurrence of stroke at 30 days and case fatality rate in stroke patients with and without atrial fibrillation were compared.

Results: Permanent AF was most common(50.9%) followed by paroxysmal(24.5%) and persistent type(24.5%). Of different types of stroke in AF, 63.5% were thrombotic,35% were hemorrhagic. 8.5% of strokes were large vessel, 24.5% were embolic, 13% were lacunar. 23% had supratentorial bleed and12% infratentorial.30 day case fatality rate was significantly higher with atrial fibrillation(22.6%); risk of early recurrent stroke (within 30 days) was 20.8% with atrial fibrillation and 6.8% with sinus rhythm. MRS and KATZ index were poor with patients having AF and stroke at admission and 30 day follow up compared to without.

Conclusion: Despite stroke and AF being oldest recognized illness, studies addressing interplay of two is still lacking! This study highlights that AF accounts for age related rise in stroke risk with compromised quality of life, increased mortality and increased risk of recurrent stroke at 30 days. It has got future therapeutic implications. Long-term monitoring with loop recorder may provide a unique opportunity to detect AF burden and potentially manage decision making in treatment

Epidemiology

Epidemiology of Acute Stroke in a Tertiary Care Center in Southern India

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Background: Poststroke, impaired proprioception and stereognosis sensation are crucial sensory dysfunctions leading to poor motor recovery. The deficits may lead to poor motor and functional recovery. The specific intervention for these deficits are lacking in stroke rehabilitation.

Aim: The aim of this study was to determine the effectiveness of an innovative intervention (neuroplasticity principles) for proprioception and stereognosis deficits on enhancing the upper limb recovery in stroke.

Methods: The subjects within one year of stroke duration exhibiting motor and proprioception and stereognosis impairments were included. The intervention included active proprioceptive and stereognosis training using the mirror-box and blindfolds through motor tasks. The sessions include 30 minutes, 40 sessions. The outcome measures were change in score of Fugl-Meyer Assessment upper extremity (FMA-UE) (0 to 66), Nottingham Sensory Assessment– Stereognosis (NSA-S) (0 to 22), and Thumb localization test (TLT) (0 to 3).

Results: A total of 31 subjects (15 in experimental group and 16 in control group) were recruited in the investigation. The mean change for motor, proprioception and stereognosis measures was greater ($p<0.05$) in the experimental group (FMA-UE = 9.84, TLT = 2.72 and NSA-S= 8.04) when compared with that of the control counterparts (FMA-UE = 4.15, TLT = 0.91 and NSA-S = 2.17) after the training.

Conclusion: The novel intervention for proprioception and stereognosis deficits may enhance motor recovery among subjects with stroke. The regime may be incorporated in stroke motor rehabilitation

Acknowledgement: Indian council of medical research (ICMR), New Delhi, India

Epidemiology

Stroke Burden in South-east Asia Varies by Income Status

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Background: South-East Asia (SEA), home to approximately 655 million people, comprises 11 countries, mostly of lower-middle (LMIC), with a few upper-middle (UMIC) and even fewer high income (HIC) countries.

Aim: This paper presents the burden of stroke in SEA.

Methods: Data on age and sex-standardised stroke mortality and stroke disability-adjusted life years lost (DALYs) per 100,000 among countries of SEA was derived from the Global Burden of Disease Study. Stroke incidence and prevalence data was obtained from community-based epidemiological studies. Stroke subtype data was based on hospital-based registries with high brain scan rates. Income status was banded as per the World Bank.

Results: Stroke mortality and DALYs were highest in Indonesia (193.3 and 3382.2 respectively) and lowest in Singapore (47.0 and 804.2 respectively). The rates were generally higher as income status fell, with the exception of Indonesia that had higher rates than other countries in its band of UMIC. Incidence rates were available in 3 countries, prevalence in 5, but comparison could not be done to differences in study designs. Stroke subtypes were variable, with intracerebral haemorrhage ranging from 18.5% (Indonesia) to 47.2% (Vietnam); there was no noticeable pattern based on income status. DALYs were stable or fell slightly between 1990 and 2010 in most countries, with notable decreases in HICs (Singapore 43.0%, Brunei 33.6%), and a few UMICs (Malaysia 25.5%) and LMICs (Vietnam 21.2%).

Conclusion: There is variable stroke burden in SEA countries. Burden tends to be highest in LMICs and lowest in HICs. Income status may play a role.

Epidemiology

Analysis of 1422 Consecutive Acute Stroke Patients During and After Covid Pandemic from A Single Tertiary Care Center, India - Ankineedu Stroke Registry

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Background: Covid pandemic has affected the Stroke Care Worldwide.

Aim: We aim to study the pattern of stroke patients attending a high volume stroke center during and after the Covid peaks.

Methods: From the start of first Covid wave in our region ie from April 2020 to July 2021, we evaluated 1422 consecutive acute stroke patients admitted into a single high volume stroke center. The admission patterns, demographics, stroke subtypes and outcomes at discharge are studied.

Results: There were total of 1422 admissions, Ischemic stroke are 1209 (85%) cases and hemorrhagic strokes are 213 (15%) cases. Males – 973 (68%) and Females - 449 (32%), Median Age – 58 yrs. In the Ischemic Stroke (1209 cases), Large vessel Occlusion seen in 417 (34%), Lacunar strokes in 435 (36%), Cardioembolic strokes in 120 cases (10%), Cerebral venous thrombosis -33 (3%) and Other causes - 204 cases (17%). Risk factors: Hypertension - 768 (63.5%), Diabetes -563 (46.5%), smoking - 151 (12.5%), Alcohol – 94 (8%), Hyperlipidemia – 91 (7.5%). 30 % Ischemic strokes are in younger age group (15-50yrs). In Haemorrhagic stroke (213) cases, Hypertension seen in 79%, Diabetes – 29%, Smoking – 8.4%, Alcohol – 11.2%. 41% of haemorrhagic strokes seen in less than 50 yrs. In-house mortality, Haemorrhagic strokes – 42 cases (19%) and Ischemic stroke – 90 cases (7.5%).

Conclusion: Overall the Stroke epidemiology, stroke subtypes and Outcomes are the same during the pandemic years except the number of stroke admissions during peak Covid time is fell by 50%

Risk Factors and Prevention of Stroke

Role of Serum Uric Acid Levels in Acute Ischemic Stroke Patients at a Tertiary Care Center of South Tamilnadu

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Background: Stroke cases constitute about 20% of total neurological cases and 20% mortality rate and long term disability due to stroke is an important cause of morbidity and warrants further studies on identifying risk factor so that proper preventive measures can be suggested. There are few studies conducted in Indian scenario, which shows the role of serum uric acid in cases of acute ischaemic stroke.

Aim: Here our aim was to evaluate role of uric acid in assessing severity of acute ischaemic stroke.

Materials and Methods: It was prospective observational study conducted on 100 patients of acute ischaemic stroke admitted in Neurology Department of TVMCH, Tirunelveli over the period of 12 months, who fulfilled inclusion criteria were included in this study. Data were recorded for further analysis.

Results: Mean serum uric acid levels was 4.81 mg/dl, Maximum value being 10.2 mg/dl and minimum value was 3.1 mg/dl. In this study the majority of cases had their serum uric acid levels < 7 mg/dl (77%), followed by SUA levels > 7 mg/dl in 23% cases. Mean NIHSS score was 6, minimum value was 1 and maximum value was 21.

Conclusion: It is concluded that elevated serum uric acid level are an important risk factor for acute ischaemic stroke and found to be associated with severity of acute ischaemic stroke.

Risk Factors and Prevention of Stroke

Aortic Arch Variants and Stroke: An Underestimated Trouble

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Background: Abnormal origin of the arteries from the aortic arch could alter haemodynamics. Therefore, aortic arch variations might predispose patients to atherosclerosis, which would increase stroke risk by impeding thrombus formation.

Aim: To investigate the prevalence of various types of aortic arch anatomy in ischemic stroke patients and to determine if aortic morphology has any bearing on early-onset strokes.

Methods: Observational study including two hundred imaging confirmed (NCCT/MRI Brain) acute ischemic stroke patients. This was followed by CT/MRI angiography of arch of aorta, neck vessels & intracranial arteries. Prevalence of various types of standard & other aortic arch variants were studied. Prevalence of stroke and its characteristics were analysed for demographics, types, location, and predominant side of involvement among standard arch variants and standard vs various aortic arch variants. P value < 0.05 was considered significant.

Results: Standard arch Type I was most common ($p<0.0001$). Age at stroke onset in Type 1 was 61.83 years±2.78 years, Type 2 was 59.8 years±3.55 years, and Type 3 was 60.96 years±3.56 years($p=0.0012$). Among the bovine aortic arch age at stroke presentation in Type A was 53.33years±8.35years, Type B was 53.36years±7.4years, and Type C was 63.25years±9.25 years ($p<0.0001$).

Conclusion: Standard Aortic arch Type 2, bovine aortic arch Type A, and Type B are associated with an early age at stroke presentation. During routine carotid evaluation by CT or MR angiography in stroke patients, it would be better to evaluate the aortic arch as well, especially in young patients.

Risk Factors and Prevention of Stroke

A Cross Sectional Survey on Awareness About Stroke Among Stroke Patients and Their Bystanders from a Tertiary Care Centre, Kerala

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Background: Stroke is the leading cause of death and functional impairment accounting a major burden of global non-communicable diseases. The knowledge about stroke, risk factors and warning signs among the patients and bystanders is an unexplored area.

Aim: The aim of this study is to assess the knowledge of stroke risk factors and warning signs among patients and bystanders.

Methods: Patients diagnosed with current and recurrent stroke of age > 18 years were recruited from in-patient units of stroke medicine department at tertiary care centre from October 2020 to April 2021. Those patients with sufficient communicative ability were included in the survey and those with severe aphasia, limiting the comprehension were excluded from the survey. A structured closed-ended study questionnaire was used to collect the data regarding the baseline characteristics and to assess the knowledge on stroke among the participants (patients and bystanders).

Results: A total of 91 patients participated in the survey. The mean age of the study population was 60.73 (13.38) years. Patients from rural places (64.8%) was more compared to urban (34.1%). Majority of the patients (85.7%) could not identify that they have been hit with stroke. The most commonly recognized risk factors were hypertension (78%), diabetes (47.3%), dyslipidemia (38.5%) followed by cardiovascular diseases(33.3%). Regarding stroke warning signs, the most commonly recognized warning signs were upper and lower limb weakness(34.1%), both upper and lower limb weakness with deviation of mouth (17.6%), both upper and lower limb weakness ,deviation of mouth and slurring of speech (7.7%). Only 12.1% bystanders were aware about the signs of stroke.

Conclusion: The general awareness of stroke is still unsatisfactory among stroke patients and bystanders. The healthcare provider should provide structured interventions to increase awareness and knowledge about stroke in the public.

Risk Factors and Prevention of Stroke

Family Stress And Risk of Stroke in Population of 25-64 Years: Gender Disparities. Based on Who Program Monica-psychosocial

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Aim: to determine the influence of family stress on the risk of myocardial infarction and stroke in an open population aged 25–64 years in Russia / Siberia.

Methods: Under the third screening of the WHO MONICA-psychosocial program (MOPSY) random representative sample including both genders aged 25–64 years was surveyed in Novosibirsk in 1994 (n=1346, 48.8% males; mean age 44.9±0.4years). Family stress was assessed by means MOPSY scale. There were 57 new-onset cases of stroke detected in the cohort over 16-year follow-up in frame of budgetary theme #AAAA-A17-117112850280-2.

Results: In the open population aged of 25-64 years the prevalence of high family stress was higher in men (31.5%) than women (20.9%). The risk of stroke was 3.45-fold higher in men and 3.52-fold higher in women with family stress. The risk of developing stroke was higher among those with high school and elementary education levels, both in men (HR = 3.9 and HR = 6.3) and women (HR = 2.87 and HR = 3.33) experienced stressful situations at home.

Conclusion: Stress in the family is more common in men within the working-age population. Family stress increases the risk of developing both myocardial infarction and stroke among men

Risk Factors and Prevention of Stroke

Impact of COVID-19 Pandemic on Secondary Stroke Prevention

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Background: COVID-19 pandemic has affected stroke care across the world in terms of access to acute therapies and rehabilitation services. However understanding of its impact on secondary stroke prevention is limited.

Aim: Here we studied the impact of COVID-19 pandemic on secondary prevention in stroke survivors by assessing their drug compliance, access to medications and treatment and risk factor control status before and during the pandemic.

Methods: Ours was a cross sectional study of patients attending stroke outpatient clinic (within 2 years of ischemic stroke) on 2 occasions-between November 2019-February 2020(pre-pandemic) and May 2020-August 2020(during pandemic). Drug compliance was measured using the first 5 items of Mars questionnaire with scores 3/5 taken as compliance. Correlations were made between drug compliance and risk factor control before and during the pandemic.

Results: We had 51 patients in the study with a mean age 56.8±11.2(35 men). The prevalence of hypertension, diabetes mellitus and dyslipidemia were 80%,58.8% and 60.8% respectively.65% of our patients had to take 5 or more tablets daily. The self reported compliance rates were 80% and 82% before and during the pandemic times. We found that glycemic control was better before than during COVID times(FBS=113 vs 134,p value:0.008,PPBS:172 vs 206,P value:0.002).While gender, education and occupational status did not affect risk factor control, compliance to medications remained statistically significant irrespective of timing of testing. Our patients did not report any difficulties in accessing medications or physicians during the pandemic.

Conclusions: Glycemic status has been affected by Covid-19 pandemic in stroke survivors, despite patients having no obvious restrictions in accessing health care system.

Risk Factors and Prevention of Stroke

Mean Platelet Volume and Severity of Acute Ischaemic Stroke

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Background: There is evidence that platelet function is accentuated in acute ischaemic stroke. MPV measured at this stage may well reflect (at least in part) the potential reactivity of platelets prior to the stroke.

Aims: 1. To determine the mean platelet volume in patients of acute ischaemic stroke. 2. To compare the mean platelet volume between cases and controls. 3. To study the association between Mean Platelet Volume (MPV) and the severity of acute ischaemic stroke assessed by Modified Rankin Scale.

Methods: The study was carried in 100 patients diagnosed with an acute ischaemic stroke within 48 hours of onset of symptoms. Mean platelet volume of all such patients and controls were measured and it was correlated with severity of ischemic stroke.

Results: MPV was higher in patients of acute ischaemic stroke as compared to controls. The median (IQR) of MPV (fl) in the Group: Case group was 10 (1.75). The median (IQR) of MPV(fl) in the Group: Control group was 7.7 (1.3). There was a significant difference between the 2 groups in terms of MPV (fl) ($W = 9188.000$, $p = <0.001$), with the median MPV (fl) being highest in the Group: Case group.

Conclusion: Our study showed that Mean Platelet volume is higher in patients of acute ischaemic stroke as compared to controls. 2. Hence, Mean Platelet Volume can be regarded as an independent risk factor for ischaemic stroke. 3. Elevated Mean Platelet Volume is associated with more severe morbidity ie. Higher Modified Rankin score.

Risk Factors and Prevention of Stroke

Hypertension and Stroke Burden in Asia-Pacific Countries

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Background: Stroke is a major cause of death and disability globally, especially in the Asia-Pacific region, home to more than 4 billion people. Hypertension is the strongest modifiable risk factor for stroke.

Aim: To investigate the association between hypertension and stroke burden in Asia-Pacific countries.

Methods: Stroke burden, as defined as age and sex-standardised Disability Adjust Life Years lost (DALYs)/100,000 due to stroke, in Asia Pacific countries was extracted from the Global Burden of Disease (GBD) Study 2010. The age and sex-standardised prevalence(%) of hypertension, defined as SBP>140mmHg and DBP>90mmHg among adults 18+ years, in these same countries was obtained from the World Health Organisation (WHO) database for 2015. Linear correlation was then performed.

Results: Data was obtained for 26 countries. There was a wide variation in DALYs due to stroke, and were lowest in Australia (398.2/100,000) and New Zealand (440/100,000), and highest in Mongolia (4,409.8/100,000) and Indonesia (3,382.2/100,000). Hypertension prevalence was also variable, and was lowest in South Korea (11.0%) and Singapore (14.6%), and highest in Pakistan (30.5%) and Nepal (29.6%). There was a modest positive correlation between DALYs due to stroke and hypertension prevalence (r=0.49). Approximately a quarter of the variation in the DALYs due to stroke was predictable from the variability in hypertension prevalence across the Asia-Pacific region (r2=0.24).

Conclusion: There is wide variability in the burden of stroke and hypertension in the Asia-Pacific region. There is a modest positive correlation between the two, with a significant proportion of the variability in stroke burden being attributable to the variation on hypertension prevalence.

Risk Factors and Prevention of Stroke

Study on Difference Between Risk Factors of Anterior and Posterior Circulation Stroke Based on the Patients Attending at a Tertiary Care Hospital of South India

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Background: In India, Stroke is a major health problem. Stroke burden has been increasing in India when compared with developed countries. Anterior circulation stroke is the commonest stroke type, whereas stroke occurring in posterior circulation forms only 20%. Risk factors of stroke are categorized into modifiable and non-modifiable. Identifying these risk factors helps in stroke prevention

Aim: Primary aim is to study the risk factor prevalence in anterior and posterior circulation stroke in adults. A secondary aim is to study the risk factor profile difference between anterior and posterior circulation stroke in adults.

Methods: An observational, cross-sectional, single-center clinic-based study of 100 indoor and outdoor patients diagnosed with ischemic stroke with age more than 18 years. Patient's demographic characteristics, stroke risk factors profiles, stroke frequencies, and Information of neuroimaging features and their relationships with strokes are obtained.

Results: Hypertension is the most common risk factor in anterior and posterior circulation stroke 67% and 56% respectively. Diabetes Mellitus is the second most common risk factor 52% and 40% in anterior and posterior stroke. Heart disease is found in 36% of anterior and 46% of posterior circulation stroke.

Conclusion: Anterior and posterior circulation have different natural histories, different pathogenic mechanisms, and different risk factor profiles. Hence, identifying risk factors will help not only in stroke prevention but also in understanding the prognosis.

Risk Factors and Prevention of Stroke

A Study of Serum Low-density Lipoprotein Levels as Risk Factor for Hemorrhagic Transformation after Acute Ischemic Stroke – An Observational Study

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Background: Hemorrhagic transformation (HTf) after acute ischemic stroke (AIS) is associated with poor outcome. Factors associated with HTf are hypertension, diabetes, thrombolysis, old age, and albuminuria. Recently, the association of low cholesterol level(TC) and hemorrhagic stroke was reported in a study, after intensive lipid-lowering therapy, but the association of HTf and the level of low TC or low-density lipoprotein cholesterol (LDLC), which is a major target of the lipid-lowering therapy, is yet undiscovered.

Methods: In this prospective observational study, 100 patients with AIS admitted to hospital for 6 months from December 2020, who weren't thrombolysed were included. Detailed history and examination were done. Blood glucose level, levels of TC, HDL and TG, National Institute of Health Stroke Scale (NIHSS) score at admission. LDLC were calculated using the following equation: LDLC=TC-HDL-0.28 ×triglycerides. The association between levels of LDLC with HTf were analysed by appropriate statistical tests after adjusting other risk factors.

Results: Of 100 patients, 62 were male and the mean age was 66.2yrs. The group had patients with hypertension 61%, diabetes 26%, hyperlipidemia 17.0%, and history of stroke 20.7%. The mean NIHSS score was 6.43±6.47. The mean±SD of TC and LDLC were: 178.6±38.6 mg/dl, and 112.1±34 mg/dl for LDLC respectively. HTf was found in 26 patients. Incidence of HTf was higher in the lowest quartile of TC (OR, 0.26, $P<0.01$) and LDLC (OR, 0.21; $P<0.01$) in LAA group which were statistically significant than cardioembolic group.

Conclusion: Low levels of LDLC and TC are associated with a high incidence of HTf after AIS in LAA.

Risk Factors and Prevention of Stroke

Risk Factors and Mechanisms of Ischemic Stroke in Young from a South Indian Tertiary Care Referral Hospital

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Background: Stroke in young has devastating implications for the patient, family, and society. There is a need to identify young adults at risk of stroke.

Aim: To identify the risk factors and mechanisms underlying stroke in young.

Methods: One sixty-four (164) consecutive patients of ischemic stroke (15-45 years age group) were enrolled in the study. All patients underwent hematological risk factor profile, vascular imaging of brain, carotids & vertebral arteries, 2D Echo, and TEE evaluation.

Results: Among the risk factors the most frequent were hypertension 53 (32.32%), Diabetes 42 (25.6%) & smoking 45 (27.4%). The most frequent mechanism of stroke in young – LAA which accounts for 26.22% of cases, followed by stroke of other etiologies in 24.1% which includes Moya - Moya 6.5%, Hematological 3.25%, CADASIL – 6.5%, Cocaine- 2.5%, and, CNS Vasculitis-3.5%, etc. Followed by Cardioembolic stroke 27 (15.85%) which includes CRHD with AF - 12, MR - 1, LAA clot - 1, left atrial myxomas-1 and severe LV dysfunction-3, small vessel disease - 26 (15.24%) & 39 (23.78%) are of stroke of unknown etiology.

Conclusion: Hypertension, Diabetes, and Smoking are the most common risk factors even in young stroke. Unlike old adults most common mechanism in stroke in young is- stroke of other etiologies followed by cardioembolic and extracranial atherosclerosis & mechanism remained unknown in almost one-fourth of all young strokes.

Risk Factors and Prevention of Stroke

Study on Recurrent Stroke in a Tertiary Care Hospital Salem

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Background: Recurrent stroke is defined as a stroke, in which there was clinical evidence of the sudden onset of a new focal neurological deficit with no apparent cause other than that of vascular origin occurring at any time after the index stroke. Each recurrent stroke was classified as ischemic or hemorrhagic on the basis of a CT or MRI scan performed within 28 days of recurrence.

Aim: to study the clinical profile of patients presented with recurrent stroke. Duration of the study: one year

Methods: Cross sectional observational study of recurrent stroke patients admitted in Neurology ward, GMKMCH, Salem, fulfilling inclusion & exclusion criteria.

Results: Total number of Patients admitted with Recurrent stroke was 73, of which males were 47 and females 26. Most common age group is above 50 years. Smoking & Alcohol are the most common risk factors among patients. Hypertension is the most common independent risk factor for recurrent stroke. In our study most commonly recurrent stroke occurred within 5 years. The most common type being Ischemic stroke and relatively higher percentage of hemorrhagic stroke occurred compared with 1st stroke. There was a higher degree of Poor drug compliance among the patients who had stroke, which may be associated with recurrence of stroke.

Conclusion: All recurrent stroke patients deserve a repeat clinical examination and relevant investigations. This enables to identify new risk factors and confirm existing and persisting / corrected risk factors. Aggressive treatment of risk factors will prolong the stroke free interval and prevent the occurrence of recurrent stroke.

Risk Factors and Prevention of Stroke

Platelet Aggregation Suppression Profile Assessed Using Light Transmission Aggregatometry and Serum Thromboxane Level in Ischemic Stroke Patient on Low Dose Enteric Coated Aspirin

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Background: Aspirin is antiplatelet drug which is the gold standard for stroke prevention and lowers the chance of recurrent vascular events.

Methods: We conducted a prospective study of platelet aggregation in ischemic stroke patients who were on 150mg/day aspirin as sole antiplatelet. Aspirin responsivness to platelet were assessed using light transmittance aggregometry (LTA) induced by arachidonic acid (AA) and adenosine diphosphate (ADP). Drug compliance was assessed using patient interview and serum salicyclic acid estimation.

Results: One-sixty patients of mean age 50 (SD 14.2) were enrolled in the study. There were 89 (55.6%) aspirin-responders, 57 (35.6%) semiresponders, and 14 (8.8%) non-responders in this study. The median distribution of serum thromboxane was 1.23 ng/ml in responders and 5.03 ng/ml in non-responders (p-value <0.001). The LTA was repeated in 59 patients on follow up. The results were not statistically different in follow up testing. Six patients had outcome events at median 11 months follow-up. The outcome events did not differ between responders and non-responders.

Conclusion: There is a significant suppression of thromboxane B2 levels in LTA responders when compared to non-responders. Given the direct relationship of LTA with AA semi-responsiveness with serum thromboxane suppression, the exact rate of aspirin non-responders would be between 8.8-18.8%. Longer follow-up may be needed to identify the clinical relevance of the aspirin responsiveness status, as the outcome events were less than 5% in the cohort.

Risk Factors and Prevention of Stroke

The Great Masquerader of Recurrent Stroke and Transient Ischaemic Attach, Unmasked as Non-Valvular AF

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Background: Atrial fibrillation is the commonest aetiology of cardio-embolic stroke. The presence of AF is the second strongest predictor of recurrent stroke, however neither symptoms nor short term monitoring are reliable in determining AF especially if it is paroxysmal. Long term monitoring provide an unique opportunity to detect the presence of paroxysmal AF, and thus to decide treatment with anticoagulants.
Aims: 1. To find out proportion of patients with recurrent ischemic stroke or a multi-infarct state having AF. 2. To find out the proportion of patients with paroxysmal AF and other types of rhythm abnormalities by continuous 72 hours Holter monitoring.
Methods: Cross-sectional study from August 2019 to January 2021 at Department of Neurology, Govt. T.D. Medical College, Alappuzha. Sample size: 66patient.s Age group: 18 years and above Screening of AF: detailed history, clinical examination,12 lead ECG, Transthoracic Echocardiography and 72 hours continuous Holter monitoring.
Results: Male=53, Female=31. Age 18-45 years = 18, >45 years = 48. Non valvular atrial myopathy: 4.5% using transthoracic Echocardiography. Paroxysmal AF: 18.2% using 72 hours Holter monitoring whereas only 9.1% using conventional 12 leads ECG. Other rhythm abnormalities: Non sustained VT(9.1%), paroxysmal atrial tachycardia(4.5%), Atrial flutter(3%),heart block(3%), ventricular ectopics(12.1%).
Conclusion: 1. A high proportion of patients with recurrent ischemic stroke have Atrial fibrillation and other rhythm abnormalities. 2. 72 hours Holter monitoring is 50 % more sensitive compared to conventional 12 leads ECG in detecting paroxysmal AF.

Neurosonology and Neuroimaging

CT Perfusion Studies in Prognosticating Acute Ischemic Stroke

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Background: CT perfusion imaging helps to identify potential areas of reversible and salvageable brain tissue in ischaemic penumbra. CTP may offer important parameters for predicting stroke outcome.

Aim: To assess the prognostic value of CT perfusion parameters in predicting stroke outcome by measuring modified Rankin scale(mRS) at admission and at 90 days.

Methods: Patients presenting with ischemic stroke within 24 hours of onset are clinically evaluated first then NCCT is done followed by CT perfusion studies. Patients within window period of 4.5 hours who are eligible for thrombolysis are given either intravenous alteplase or tenecteplase. CT perfusion parameters like infarct core volume and location of infarct are used to predict stroke outcome by mRS at admission and at 90 days.

Results: 100 patients were included. The volume of infarct core had sensitivity of 71.64% in predicting poor prognosis as per mRS at 90 days and significant association was observed for poor prognosis with infarction in insular ribbon, thalamus, lentiform nucleus, internal capsule, ACA territory, M1 territory as measured by mRS at 90 days.

Conclusion: The present study shows that CT perfusion imaging can be used to identify infarct location and infarct volume in acute ischaemic stroke and these will help in better prediction of prognosis by predicting functionality of affected area. Identification of infarct location and determining the effect on functionality will help to decide on any additional therapies that might aid in recovery of the patient.

Neurosonology and Neuroimaging

Diagnostic Performance of Susceptibility Weighted Imaging Brain for the Detection of Cerebral Venous Thrombosis in Patients Presenting with Headache

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Background: Magnetic resonance venography (MRV) brain is the gold standard for diagnosing cerebral venous thrombosis (CVT). Susceptibility-weighted imaging (SWI) is a high-spatial resolution, (MR) technique that is exquisitely sensitive to venous blood, hemorrhage and iron storage.

Aim: To know the diagnostic performance of SWI in detecting CVT compared to MRV and to facilitate early diagnosis of CVT where MRV not feasible.

Methods: A prospectively study, included patients presenting with clinical symptoms of CVT who underwent MRI (1.5T) brain with MRV. We determined the sensitivity, specificity, predictive value, accuracy, degree of agreement between SWI and MRV in detecting CVT.

Results: Out of 100 cases, 64 were females. Majority of patients presented with headache (100%) and CVT was diagnosed in 55 cases. Majority of patient had transverse sinus (TS) thrombosis (54%). The overall diagnostic accuracy of SWI sequence was 76.31% and that of MRV was 95.18%. Sensitivity of SWI versus MRV was 63.22% Vs 91.23%; Specificity 92.31% Vs 100%; Positive predictive value 90.95% vs 100%; Negative predictive value 67.25% vs 90.32% respectively. 95% confidence interval was observed for the specificity and positive predictive value of the SWI test. There exists good degree of agreement between both imaging modalities with 98% accuracy to detect cortical vein thrombosis by SWI.

Conclusion: SWI sequence added on the conventional MRI can be used as the first line imaging modality for evaluation of patient with CVT where MRV brain is not feasible. SWI has higher diagnostic performance in detecting isolated cortical vein thrombosis.

Neurosonology and Neuroimaging

Validation of Alberta Stroke Program Early CT Score (ASPECTS) Calculated using RAPID Artificial Intelligence software

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Aim - We compared the agreement between the Alberta Stroke Program Early CT Score (ASPECTS), calculated using a machine learning-based automatic software tool, RAPID ASPECTS and the median score from 2 experienced readers in patients with acute ischemic stroke.

Methods: All the patients who presented to us with acute ischemic stroke from October 2020 to August 2021 were evaluated using NCCT head or DWI MR sequence. A total of 28 patients were evaluated. 10 patients had NCCT followed by DWI sequence for DWI ASPECTS. The scans were evaluated by blinded experienced readers to determine both CT and DWI ASPECTS. The CT scans and DWI images were also evaluated by an automated Artificial Intelligence software program (RAPID ASPECTS). DWI ASPECTS, the median CT ASPECTS of the neuro radiologists and the automated score using RAPID software were compared using the interclass correlation coefficient.

Results: There was an agreement with regard to DWI- ASPECTS and RAPID ASPECTS with kappa values of .94 and .93. Median error for RAPID ASPECTS was 1 (interquartile range, −1 to 3) versus 3 (interquartile range, 1–4) for clinicians ($P<0.001$), when DWI ASPECTS was used as reference method.

Conclusions: RAPID ASPECTS results were comparable to DWI ASPECTS. RAPID ASPECTS results were more accurate than NCCT-ASPECTS read by experienced clinicians in identifying early evidence of brain ischemia, when DWI ASPECTS was taken as a reference method.

Neurosonology and Neuroimaging

Comparison Between Standard Linear Ultrasound Transducer And High Frequency Hockey-stick Ultrasound Transducer in Assessment Of Carotid Arterial Atherosclerosis

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Background: High frequency (17 MHz) hockey stick shaped ultrasound probes have a potential to better characterise carotid atherosclerotic plaques in terms of echogenicity, irregularity/ ulcerations, intra plaque haemorrhage/ calcification and degree of carotid stenosis when compared to standard linear transducers.

Aim: The aim of this study is to compare a newly developed high frequency hockey stick probe to a standard linear carotid probe in detection of atherosclerosis of the neck arteries.

Methods: We examined 65 patients of acute or chronic cerebral infarcts with high frequency hockey stick probe (Alpinion, BPL, 17 MHz) and a standard linear probe (Alpinion, BPL, 5-12 MHz). Measurements included intima-media thickness (IMT) in the common carotid arteries (CCA), carotid bifurcations (BIF), cervical internal carotid arteries (ICA), detection and characterisation of carotid plaques and degree of stenoses.

Results: Our results showed that high frequency hockey stick transducer has improved spatial resolution to detect plaque stability (plaque irregularity- $p<0.5$, intra plaque haemorrhage - $p<0.5$, echogenicity- p-0.6), non significant agreement in terms of detection of carotid stenosis and intima-medial thickness.

Conclusion: The high frequency hockey-stick probe showed better resolution for detection of plaque morphology and agreement with a standard linear probe in detecting atherosclerosis of the carotid arteries and has therefore the potential for use in assessment of carotid arterial atherosclerosis

Neurosonology and Neuroimaging

Correlation Between Pulsatility Index in Transcranial Doppler and Post Stroke Outcomes in Patients with Acute Lacunar Strokes

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B**ackground:** Lacunar infarcts, a manifestation of cerebral small vessel disease (cSVD) is associated with poor post-stroke functional outcomes and depression. Pulsatility index (PI), calculated using Transcranial Doppler(TCD) estimates the downstream cerebral microcirculatory resistance.

Aim: We aimed to determine whether changes in PI correlates with post-stroke outcomes with respect to neurological deficits, disability and depression, following an acute lacunar stroke.

Methods: Patients aged 18-80 years within 2 weeks of onset of an acute lacunar stroke were recruited. Baseline and 3 month NIHSS, mRS and BDI-2 scores were collected. PI was calculated from both Middle Cerebral Arteries and used to correlate with outcomes at 3 months.

Results: Among the 45 patients enrolled, the mean PI was 1.3. The mean scores of NIHSS, mRS and BDI-2 at baseline were 5.6(SD=3.4), 3.4(SD=0.9) and 7.3(SD=7.1) respectively. At 3 months, the mean scores of NIHSS, mRS and BDI-2 were 1.7(SD=2.1), 1.4(SD=1.25) and 5.4(SD=5.1) respectively. Patients with PI 1.3 were more likely to have higher stroke severity, poor functional and depression scores both at baseline and at 3 months follow up. The severity of leukoaraiosis did not seem to influence the outcomes at 3 months. The baseline NIHSS scores correlated significantly with the 3 month NIHSS and BDI-2 scores.

Conclusion: Patients with elevated PI had more deficits, poorer mRS and depression scores at all points of evaluation. Severe deficits at stroke onset influences the outcomes at 3 months. Pulsatility index is a physiological indicator that can better reflect the microcirculatory dynamics as compared to leukoaraiosis.

Neurosonology and Neuroimaging

Common Carotid, Internal Carotid, and Vertebral Artery Profile in Cerebral Small Vessel Disease Patients at Dr. Cipto Mangunkusumo Hospital, Indonesia

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Background: Cerebral small vessel disease (CSVD) remains as a leading cause for disabilities and mortalities. Previous studies have shown larger carotid diameter in CSVD patients. However, there was no study regarding its relationship with large artery profile.

Aim: This study aimed to investigate the profile of common carotid, internal carotid, and vertebral artery in Indonesian CSVD patients.

Methods: This was a cross-sectional study done on stroke patients visiting Cipto Mangunkusumo National General Hospital during the period of January to December 2020. A total of 180 participants undergoing brain CT-scan, brain MRI, and carotid ultrasound were included. Subjects were categorized into CSVD and non-CSVD groups. Clinical characteristics, arteries diameter, and ultrasound parameters were compared between groups. Comparison was done using Mann Whitney U test.

Results: There were 105 CSVD and 75 non-CSVD subjects. Hypertension, diabetes, and sedentary lifestyle were more prevalent in CSVD group. The diameter of carotid arteries (RCCA, RICA, RVA, LCCA, LICA, LVA) were rather similar between groups ($p > 0.05$). Increased LICA PSV (53.6 vs. 45.9, $p = 0.001$), EDV (17.9 vs. 15.6, $p = 0.049$), and MFV (30 vs. 24.5, $p = 0.002$) were observed in CSVD patients ($p < 0.05$).

Conclusion: There was no difference in common carotid, internal carotid, and vertebral artery diameter between stroke patients with and without CSVD. Higher velocity parameters were found at left internal carotid artery (LICA) in patients with CSVD.

Neurosonology and Neuroimaging

Carotid and Vertebral Arteries Profile in Coronary Artery Disease at Dr. Cipto Mangunkusumo Hospital, Indonesia

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Background: Atherosclerosis is a systemic inflammatory vascular disorder, which can involves multiple arteries. Stroke and coronary artery disease remains the leading cause of mortality and morbidity due to atherosclerosis. Carotid and vertebral sonography can performed to measure the abnormality due to atherosclerosis.

Aim: To obtain carotid and vertebral sonography profile in coronary artery disease patients.

Methods: This was cross-sectional study used registry data from Neurosonology clinic at Cipto Mangunkusumo Hospital from January to December 2020. Arteries profile were evaluate using carotid and vertebral sonography.

Results: There were 31 subjects with mean age of 62,5 ± 7,9 years. Stroke ischemic was found in 10 subjects (32,3%), most of them had vascular risk factor such as smoking in 20 subjects (64,5%) and hypertension in 9 subjects (29%). Thickening of intima media complex was found in 19 subjects (61,3%) with median was 1,1 mm (0,97 – 1,13), most of them occurred bilateral (41,9%) in carotid arteries. There were plaque in 20 subjects (64,5%) and stenosis in 2 subjects (6,5%) in carotid arteries. The median pulsatility index in carotid arteries and vertebral arteries were relatively high, CCA was 1,4
± 0,28, ICA 1,08 (0,93 – 1,24) and VA 1,16 (1,01 – 1,35).

Conclusion: Carotid abnormalities in coronary artery disease such as intima media thickness, plaque, and stenosis. Both carotid and vertebral arteries had high pulsatility index which can figuring atherosclerosis. Carotid and vertebral sonography is important to detect early atherosclerosis in extracranial arteries which going to intracranial before they become symptomatic.

Neurosonology and Neuroimaging

Extracranial Vertebral Artery Pulsatility Index o Ischemic Stroke Patients and Associated Comorbidities

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Background: Vertebral artery (VA), the major vascularization of posterior circulation, supports the cerebral blood flow when the anterior circulation is compromised. Doppler ultrasound is a non-invasive tool for evaluating extracranial arteries in patients with cerebrovascular diseases. Pulsatility index (PI) reflects distal vascular resistance and large vessel stiffness, associated with ischemic stroke.

Aim: To describe the vertebral arteries' PI in pre-existing ischemic stroke subjects with their comorbidities.

Methods: This is a cross-sectional study from the stroke registry of Cipto Mangunkusumo General Hospital, Jakarta, Indonesia. Extracted data were within January to December 2020. Ultrasonographic parameters were Peak Systolic Volume (PSV), End Diastolic Volume (EDV), to formulate Pulsatility Index (PI). Mean difference between PI of single comorbidity group and of multimorbidity group for each VA side was compared with Mann-Whitney test.

Results: There were 71 subjects, with the majority of male (62%), with mean age 59,6±9.9. The most prevalent comorbidities were hypertension (82%), diabetes mellitus (46%), and coronary heart disease (CHD) (25%). There were 45% subjects with multimorbidity. Right VA PI (1,03 (0,85-1,35)) and left VA PI (1,00 (0,87-1,20)) were within normal limit. Our data showed no statistical difference between vertebral arteries PI of single and multimorbidity group in bilateral VAs.

Conclusion: There were no increased PI of bilateral vertebral arteries in our findings, despite pre-existing comorbidities. This might also explain vertebral arteries' patency in maintaining cerebral blood flow through posterior circulation in ischemic stroke individuals with vascular comorbidities.

Neurosonology and Neuroimaging

Carotid Intima - Media Thickness, Common Carotid Artery Diameter in Ischemic Stroke and Its Associated Risk Factors

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Background: Ischemic stroke is a manifestation of blood vessel occlusion due to embolism or atherosclerosis. Intima-media thickening and changes in the diameter of the common carotid artery (CCA) are thought to be indicators of atherosclerosis that can be assessed with carotid doppler.

Aim: To describe the carotid intima-media thickness (CIMT) and CCA diameter profile in ischemic stroke and its associated risk factors.

Methods: This was a retrospective cross-sectional study using the registry in Neurology Outpatient Clinic, RSUPN Dr. Cipto Mangunkusumo in January 2019- September 2020, which was analysed using T-test and Mann-Whitney test.

Results: Of 232 subjects with mean age 57.69±11.51 years, 145 (62.5%) were male. Mean CIMT and median CCA diameter were 0.9 (0.35-1.70)mm and 0.70±0.11cm, respectively. The most prevalent risk factor for ischemic stroke were hypertension (192 [82,7%]), dyslipidemia (173 [74.57%]), smoking (107 [46.12%]) and diabetes [79 (34.05%]). Increased CIMT was more common in male (0.97±0.24mm vs 0.87±0.20mm, $p<0.05$) and significantly associated with age ≥60 years (1.00[0.45-1.70]mm vs 0,85[0,35-1,55]mm, p=0.001) and hypertension (0.93 [0.45-1.70]mm vs 0,80[0,35-1,25]mm, p=0.002). The CCA diameter was also larger in male (0.71[0.34-1.58]cm vs 0.66[0.54-0.94]cm, $p<0.05$) and significantly associated with the diameter were hypertension (0.70[0.34-1.58]cm vs 0,65[0,52-0,82]cm, p=0.003), dyslipidemia (0.70[0.34-1.58]cm vs vs 0,67[0,52-0,90]cm, p=0.03), diabetes (0.73[0.40-0.94]cm vs 0,68[0,34-1,58]cm, p=0.014) and smoking (0.71[0.40-1,58]cm vs 0,68[0,34-0,94]cm, p=0.011).

Conclusion: CIMT and CCA diameter were important to be assessed as some of the risk factors of ischemic stroke. Increased CIMT and CCA diameter were found more frequently in elderly patients, male and hypertension.

Neurosonology and Neuroimaging

Acetazolamide Challenged Metabolic Imaging for Stroke Prevention & Management

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Background: The optimal management of patients with chronic large vessel occlusion presenting with hemodynamic stroke continue to be challenging and with treatment dilemmas.

Aim: This study aims to identify adult patients with haemodynamic stroke with high risk based on metabolic imaging with acetazolamide challenge and perform Revascularisation procedure to prevent further stroke.

Methods: This is a retrospective study from 2012 till date. 48 adult patients with age ranging from 26 to 72 years with recurrent TIAs & large vessel occlusion were evaluated by neuroimaging and subsequently with SPECT/MR/CT perfusion studies. Baseline images were obtained and after administering 1500mg of tablet Acetazolamide in 3 divided doses at 15 minutes' interval, the perfusion studies were repeated. The baseline and post acetazolamide images were then compared. In 10 patients, who presented as semi emergency, only baseline images were obtained.

Results: In 13 patients, there was type 1 response, 9 patients- type 2 responses & 16 patients - type 3 response (Decompensated hemodynamics). Patients with type 3 response (and 10 patients in whom challenge could not be done in view of emergency) underwent cerebral revascularisation with STA-MCA bypass. The remaining 22 patients with type 1 & 2 response were continued on best medical management. 92% patients recovered well without any further TIAs. Follow-up evaluation showed good graft patency in 97% (25/26) patients.

Conclusion: Acetazolamide challenged metabolic cerebral imaging is a valuable tool in detecting high risk patients with hemodynamic stroke and can be a guide for further management by cerebral revascularisation to prevent further stroke.

Neurosonology and Neuroimaging

Cervical Artery Pseudo- Occlusion in Emergent Large Vessel Anterior Circulation Stroke

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Background: Cervical Internal carotid artery Pseudo-occlusion(CIPO) is an artefactual non-visualisation of flow in cervical internal carotid artery(ICA) when there is distal occlusion in ICA or proximal middle cerebral artery (MCA) due to stagnant flow in the ipsilateral proximal vessels relative to flow in the contralateral ICA and the speed of image acquisition in CT angiography(CTA). CIPO can be misinterpreted as proximal ICA occlusion and treatment may be denied in otherwise eligible patients as long segment proximal ICA occlusion are poor candidates for intervention

Aim: To examine in the proportion of patients with CIPO in patients with emergent large vessel occlusion stroke (ELVO) in the carotid territory.

Methods: CTA of patients ELVO were reviewed. CIPO was considered to be present when Cervical ICA was not filling in CTA, but filling in CT venography (CTV).

Results: Out of 143 patients with LVO; 106 (74.12%) had proximal M1occlusion, 25(17.4%) had terminal ICA occlusion(tICA), 12(8.3%) had distal M1 occlusion. Extracranial ICA was not visualised in 25(12.6%) patients. Among 25 patients with total ICA occlusion, 11(44%) had CIPO. Plausible determinants were diabetes and cardiac diseases found in 4 (36.3%) patients each.

All the patients had gradual tapering of contrast in the CTA and terminal ICA occlusion. Out of 11 patients, 6 patients were eligible for intervention. None of these patients had occlusion in DSA.

Conclusion: CIPO is a common condition in ELVO. Cardiac illness and diabetes are plausible determinants of CIPO.

Neurosonology and Neuroimaging

Sequential Carotid Doppler in Acute Stroke and its Clinical Correlation

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Background: Stroke has significant morbidity and mortality. NIHSS, used clinically for prognosis of stroke, is subjective and needs expertise. Transcranial doppler, used to assess cerebral hemodynamics following stroke, is available only in advanced neuro-centers in India. Carotid doppler is an alternative cost effective and widely available bedside tool.

Aim: This study was planned to evaluate internal carotid artery doppler parameters to see changes in cerebral hemodynamics following stroke.

Methods: 100 patients of acute stroke presenting within 48 hours were assessed on days 1,3 and 5 of admission on NIHSS and also by Ipsilateral Internal Carotid Artery Doppler monitoring for Resistive Index(RI) and Pulsatility Index(PI). Paired t-test was used for analysis.

Results: We found that patients whose NIHSS score decreased on days 3 and 5 with respect to day 1 showed increasing RI and PI value over 5 days. Mean change in RI was 0.01 and 0.03 respectively. (95% CI: -0.05,0.07 vs. 0.01,0.05). Mean change in PI was 0.26 and 0.11 respectively. (95% CI: - 0.21,0.72 vs. -0.001, 0.21).

Patients whose NIHSS score increased on days 3 and 5 with respect to day 1 showed decreasing RI and increasing PI values over 5 days. Mean change in RI was -0.063 and -0.065 respectively. (95% CI: -0.18,0.05 vs. -0.14 ,0.01). Mean change in PI was 0.09 and 0.18 respectively. (95% CI -0.14 ,0.32 vs - 0.31,0.68).

Conclusion: Resistive Index increased over time in patients who improved and decreased in patients who deteriorated. Pulsatility index increased in both groups. We hypothesize that sequential carotid doppler RI monitoring could be a promising bedside prognostic marker in acute stroke. Future studies with larger samples are needed to validate this observation.

Neurosonology and Neuroimaging

Diffusion Tensor Imaging - Magnetic Resonance Tractography in Subacute Stroke to Predict Clinical Outcome

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Background: DTI is an MRI technique which provides information about the orientation and structural organization of white matter fibres and, through tractography, the trajectories of cerebral white matter tracts can be obtained. The DTI metric functional anisotropy (FA) is influenced by myelination, diameter, density, and orientation of axons. Anisotropy measurement helps in detecting the degree of fibre damage in stroke.

Aim: To assess whether anisotropy using Diffusion Tensor Imaging in the corticospinal tract correlates with motor outcome after stroke.

Methods: IEC clearance was obtained and a prospective observational study among 86 adults with new onset, single anterior circulation stroke, was conducted after obtaining informed consent. DTI was done using 1.5T MRI scanner between day 2-10 of stroke and FA, ADC and voxels of the infarct and contralateral side were derived and thus their ratios. Clinical assessment was done by NIHSS at the time of scan, MRS and Barthel score on days 7, 30 and 90. Statistical analysis using Chi-square and ANOVA tests was done to determine association of DTI-metrics with motor outcome and ROC curves were used to determine DTI-metric cut-offs to predict motor outcome.

Results: rVoxels had strong positive correlation with NIHSS score which was statistically significant. FA and rFA cut-off values, 0.356 and 0.465 respectively were defined to predict moderate to severe disability and dependency.

Conclusion: Number of fibres/ voxels and rVoxels correlated with severity of stroke at presentation.
DTI metrics- FA and rFA is a surrogate marker to predict long term motor outcome in stroke patients

Neurosonology and Neuroimaging

Wernekink Commissure Syndrome: Clinico-radiological Criteria

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Background: Wernekink commissure syndrome is a rare midbrain syndrome selectively affecting the Wernekink commissure, characterized by bilateral cerebellar ataxia and eye movement disorders, especially internuclear ophthalmoplegia.

Aim: To propose a clinico-radiological criteria for Wernekink commissure syndrome with review of the neural circuitary responsible, to aid in recognition and reporting.

Methods: This was a prospective study conducted at the Department of Neurology, at Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala, India, over a period of 5 years among patients with pure midbrain syndromes. All patients with pure midbrain infarction were studied. Subjects presenting with clinical features of Wernekink commissure syndrome were shortlisted and assessed by investigators independently along with Neuroradiology. The demographic profile, risk factors, clinical features, neuroimaging findings and outcomes were analysed using the Statistical Package for the Social Sciences version 21 software.

Results: Details of 43 subjects with pure midbrain stroke were included in the study. Eight had clinical features of Wernekink commissure syndrome. The most common findings were bilateral ataxia and unilateral or bilateral internuclear ophthalmoplegia. None had palatal tremor. Unilateral caudal paramedical infarction was seen on MRI in five patients, whereas it was bilateral in three patients.

Conclusion: The proposed clinico-radiological criteria consisting of all of the essential criteria (ipsilateral internuclear ophthalmoplegia, unilateral or bilateral ataxia and neuroradiological evidence of caudal midbrain involvement) with or without one among the supportive criteria (rubral tremor, palatal myoclonus) can safely point at a diagnosis of Wernekink commissure syndrome.

Acute Management

Edaravone – A Ray Of Hope In Acute Ischemic Stroke (AIS) With Malignant Infarcts / large Volume Infarcts

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Aim: To establish and support the role of Edaravone – A free radical scavenging agent in the treatment of Acute Ischemic Stroke (AIS) within 96 hours of onset of stroke.

Methods: Prospective study undertaken in a tertiary care centre from South India from October 2020 to February 2021. Eight patients with large volume infarct (defined as more than 1/3rd of the arterial territory) who denied/not fit for decompressive hemicraniectomy were included in the study. Those with baseline mRS> 1, acute coronary syndrome and acute kidney injury were excluded. Intravenous Edaravone (60 mg stat followed by 30 mg twice a day for 14 days) was administered within 96 hours of onset of stroke. GCS, NIHSS, mRS were assessed on admission, at the time of discharge and 1 month after discharge. An improvement in any of these parameters was considered as a significant response.

Results: Male:Female = 3:5. Mean age of the population was 55±5.1 years. Mean time to discharge was 7±2 days. All the patients showed improved GCS at the time of discharge. Improved mRS by 1 to 2 point score was observed in 7/8 (87.5%) patients.

Conclusion: Though standard treatment strategies have not been laid regarding the indications for Edaravone, our study supports the existing evidence of improved functional and survival parameters with early initiation of Edaravone. It will not be an exaggeration if we take the liberty in proposing that early initiation of Edaravone may evade the need for decompressive surgeries in large volume ischemic strokes.

Acute Management

Functional Outcome After Twenty Four Hours in Patients Undergoing Thrombolysis with Alteplase for Acute Ischemic Stroke

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Background: Stroke is a major cause of mortality and morbidity in our society. Intravenous thrombolysis is the recommended treatment for acute ischemic stroke. Functional outcome after thrombolysis depends on many factors.

Aim: To study the functional outcome of intravenous thrombolysis with alteplase after twenty four hours.

Methods: We studied twenty five cases of acute ischemic stroke prospectively from September 2020 to August 2021 and data was collected. Based on inclusion and exclusion criterias, thrombolysis was done with intravenous alteplase for patients presenting within 4.5 hours of symptom onset. Primary outcome was measured with National Institutes of Health Stroke Scale(NIHSS) at admission and twenty four hours after thrombolysis.

Results: Twenty five patients were studied. Mean age of patients was 46.56 years with a standard deviation(SD) of 11.9 and majority were males. Mean time duration from onset of symptoms to arrival in hospital was 144.52 minutes (SD-57.1) and mean door to needle time was 54.8 minutes (SD-34.3). Improvement was noted in 10 patients(40%) whereas 7 patients(28%) died.

Conclusion: Intravenous thrombolysis reduces the morbidity and mortality in patients of acute ischemic stroke. This study also suggests the associated crucial factors that are concerned with outcome.

Acute Management

Effectiveness Of Rivaroxaban Initiated Within 48 Hours Versus 7 Days After Ischemic Stroke Due to Atrial Fibrillation on Stroke Prevention Detected By Magnetic Resonance

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Background: The optimal time to start oral anticoagulant (OAC) in patients with ischemic stroke due to atrial fibrillation (AF) is unknown. Non-vitamin K antagonist oral anticoagulants (NOACs) are superior to warfarin in reduction of the intracranial bleeding risk.

Aim: The aim of this study is to assess the efficacy and safety of rivaroxaban initiated within 48 hours versus at 7 days after a stroke onset on prevention of ischemic stroke among patients with atrial fibrillation by compare the prevalence of recurrent ischemic stroke and hemorrhagic transformation between patients receiving rivaroxaban within 48 hours versus at 7 days after a stroke onset among patients with ischemic stroke related atrial fibrillation.

Methods: We performed a randomized, open-label, blinded end point evaluation trial. Consecutive patients with AF with acute ischemic stroke within 48 hours after onset who had no contraindications to receiving secondary prophylaxis with rivaroxaban were randomized (1:1) into rivaroxaban initiated within 48 hours after stroke onset (early rivaroxaban group) or rivaroxaban initiated at 7 days (late rivaroxaban group). Computed tomography (CT) scan or magnetic resonance imaging (MRI) of the brain was performed before randomization to exclude intracranial hemorrhage. A follow-up MRI scan of the brain was subsequently performed 4 weeks after the initial event. The primary outcome was new ischemic lesion seen on results of MRI of the brain at 4 weeks. The secondary outcome was intracranial hemorrhage seen on results of MRI of the brain at 4 weeks.

Results: A total of 26 patients (15 women and 11 men; mean age 72.1 years) were studied. Thirteen patients were randomized into early rivaroxaban group and 13 patients were randomized to late rivaroxaban group. The early rivaroxaban group and late rivaroxaban group showed no significant differences in the rate of new ischemic lesion (7.7 % vs 15.4%, P=0.54) or the rate of intracranial hemorrhage (61.5% vs 30.8%, P=0.12). All of the intracranial hemorrhages were asymptomatic hemorrhagic transformations.

Conclusion: In acute ischemic stroke related AF with small or medium-sized infarction, early rivaroxaban (initiated within 48 hours after stroke onset) and late rivaroxaban (initiated at 7 days) had comparable efficacy and safety. All of the intracranial hemorrhages were asymptomatic hemorrhagic transformations.

Acute Management

Factors Influencing Recanalization After Mechanical Thrombectomy with First Pass Effect for Acute Ischemic Stroke

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Background: First pass effect (FPE) is increasingly recognized as a predictor of good outcome in large vessel occlusion (LVO).

Aim: This study aimed to elucidate the factors influencing recanalization after mechanical thrombectomy (MT) with FPE in treating acute ischemic stroke (AIS).

Methods: Main databases were searched for relevant randomized controlled trials (RCTs) and observational studies reporting influencing factors of MT with FPE in AIS. Recanalization was assessed by the modified Thrombolysis in Cerebral Ischemia (mTICI) score. Both successful (mTICI 2b-3) and complete recanalization (mTICI 2c-3) were observed. Risk of bias was assessed through different scales according to study design. I2 statistic was used to evaluate the heterogeneity, while subgroup, meta-regression and sensitivity analysis were performed to investigate the source of heterogeneity. Visual measurement of funnel plots was used to evaluate publication bias.

Results: A total of 17 studies and 6186 patients were included. Among them, 2068 patient achieved recanalization with FPE. The results of meta-analyses showed that age (mean deviation (MD):1.21,95% confidence interval (CI): 0.26-2.16; p=0.012), female gender (odds ratio (OR):1.12,95% CI: 1.00-1.26; p=0.046), diabetes mellitus (DM) (OR:1.17,95% CI: 1.01-1.35; p=0.032), occlusion of internal carotid artery (ICA) (OR:0.71,95% CI: 0.52-0.97; P=0.033), occlusion of M2 segment of middle cerebral artery (OR:1.36,95% CI: 1.05-1.77; p=0.019), duration of intervention (MD:-27.85, 95%CI: -42.11--13.58; p<0.001), time of onset to recanalization (MD:-34.63, 95%CI: -58.45--10.81; p=0.004), general anesthesia (OR:0.63,95% CI: 0.52-0.77; p<0.001) and use of balloon guide catheter (BGC) (OR:1.60,95% CI: 1.17-2.18; p=0.003) were significantly associated with successful recanalization with FPE. At the same time, age, female gender, duration of intervention, general anesthesia, use of BGC, and occlusion of ICA were associated with complete reperfusion with FPE, but M2 occlusion and DM were not.

Conclusion: Age, gender, occlusion site, anesthesia type and use of BGC were influencing factors for both successful and complete recanalization after first pass thrombectomy. Further studies with more comprehensive observations indexes are need in the future.

Acute Management

General anesthesia versus conscious sedation for endovascular therapy in acute ischemic stroke

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Background: Endovascular thrombectomy (EVT) is the first-line treatment for patients with acute ischemic stroke (AIS). However, the optimal anesthetic modality during EVT is unclear.

Aim: Therefore, this study is aimed to summarize the current literatures from RCTs to provide new clinical evidence of choosing anesthetic modality for AIS patients when receiving EVT.

Methods: Literature search was conducted in following databases, EMBASE, MEDLINE, Web of Science, and the Cochrane Library, for relevant randomized controlled trials (RCTs) comparing general anesthesia (GA) and conscious sedation (CS) for AIS patients during EVT. We used the Cochrane Collaboration criteria for assessment of risk bias of included studies. The heterogeneity of outcomes was assessed by I^2 statistic.

Results: 5 RCTs with 498 patients were included. GA was conducted in 251 patients and CS in 247 patients. EVT under GA in AIS patients had higher rates of successful recanalization (RR: 1.13, 95% CI: 1.04-1.23; P = 0.004; I2 = 40.6%) and functional independence at 3 months (RR: 1.28, 95% CI: 1.05-1.55; P = 0.013; I2 = 18.2%) than CS. However, GA was associated with higher risk of mean arterial pressure (MAP) drop (RR: 1.71, 95% CI: 1.19-2.47; P <0.01; I2 = 80%) and pneumonia (RR: 2.32, 95% CI: 1.23-4.37; P = 0.009; I2 = 33.5%). There was no difference between GA and CS groups in mortality at 3 months, interventional complications, intracerebral hemorrhage and cerebral infarction after 30 days.

Conclusion: GA was superior over CS in successful recanalization and functional independence at 3 months when performing EVT in AIS patients. However, GA was associated with higher risk of MAP drop and pneumonia. Therefore, results of ongoing RCTs will provide new clinical evidence of anesthetic modality selection during EVT in the future.

Acute Management

Mechanical thrombectomy in nonagenarians

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Aim: This study aimed to summarize the current literature on mechanical thrombectomy (MT) in nonagenarians and to provide updated clinical evidence of its feasibility, effectiveness, and safety in nonagenarians.

Methods: PubMed, EMBASE, the Cochrane Library, and Web of Science were searched for relevant randomized controlled trials and observational studies that reported the clinical outcomes of nonagenarians with acute ischemic stroke after undergoing mechanical thrombectomy. Risk of bias was assessed using different scales. I2 statistic was used to evaluate the heterogeneity of the results, while meta-regression and sensitivity analyses were performed to investigate the source of heterogeneity.

Results: Thirteen studies and 657 patients were included. The estimated rate of successful revascularization was 80.82% (95% confidence interval [CI]: 77.48% - 83.97%), and the rate of favorable outcome (modified Rankin score [mRS] 0 - 2) was 21.60% (95% CI: 13.81% - 30.41%). The rate of good outcome (mRS score 0 - 3) was 23.08% (95% CI: 18.88% - 27.55%). The estimated risk of death during hospitalization was 20.55% (95% CI: 15.93% - 25.55%), while the mortality rate at 3 months was 44.38% (95% CI: 33.66% - 55.36%). The rate of intracranial hemorrhage (ICH) occurrence was 12.84% (95% CI: 5.27% - 22.68%), while the rate of symptomatic intracranial hemorrhage (sICH) was 3.52% (95% CI: 1.67% - 5.85%). The rate of hospital-related complications was 26.93% (95% CI: 10.53% - 47.03%).

Conclusion: MT in nonagenarians demonstrated a high rate of successful revascularization. Conversely, the rate of futile revascularization is high with a low functional independence proportion. Therefore, MT should not be indiscriminately advocated in nonagenarians. Satisfactory results require careful selection of patients. Further high-quality studies are needed to clarify the selection algorithm.

Acute Management

Early In-hospital Triage For Large Vessel Occlusion: A Comparison Of Nihss, Gai2aa Scale And Astral Occlusion Score

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Background: Early initiation of endovascular revascularisation therapy (EVT) is essential for maximum clinical benefit in acute ischemic stroke with large vessel occlusion.

Aim: We aim to compare three in-hospital scores used for early prediction of large vessel occlusion (LVO).

Methods: Demographic, clinical and vascular imaging data was analysed retrospectively from a cohort of 168 patients who presented with acute ischemic stroke within 4.5 hours from onset. Large vessel occlusion was defined as intracranial carotid, basilar, and M1 or M2 segment of middle cerebral artery occlusions on CT angiogram. NIHSS (National Institute of Health Stroke Scale), GAI2AA (Gaze, Aphasia, Inattention, Arm paresis, Atrial fibrillation) scale and Astral Occlusion Score were calculated.

Results: Large vessel occlusion was present in 55(33%) patients. LVO was significantly associated($p<.05$) with history of smoking, previous transient ischemic attack/stroke and higher NIHSS scores. Median NIHSS score was 9(Interquartile range 6, 12) in patients with LVO and 13(10, 17) in those without LVO. GAI2AA had the maximum accuracy [Area under receiver operated curve (AUC) -.92] compared to NIHSS (AUC- .78) and Astral Occlusion scores (AUC - .77). Using cut-off score of NIHSS ≥8 had the greatest sensitivity (87%) but specificity was only 58%. GAI2AA score ≥3 had maximum accuracy with sensitivity 78% and specificity 81%. Gaze palsy was the best single discriminator.

Conclusion: GAI2AA scale performed better than NIHSS score and Astral Occlusion score for early prediction in LVO and is useful in early in-hospital triage.

Acute Management

Thrombolysis with Novel Tenecteplase in Acute Ischemic Stroke: A Prospective Observational Study From A Rural Tertiary Care Center in South India

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Background: About 85.5% of stroke deaths worldwide is accounted from the low & middle income countries in the Asia-Pacific region, and the number of disability-adjusted life-years in these countries is reported to be 7 times higher than in the high-income countries. In India, alteplase was the only approved thrombolytic therapy until 2016 after which tenecteplase was approved by drug controller general of India (DCGI) .

Aim: To observe the clinico-epidemiological profile and to assess the outcome of acute ischemic stroke patients treated with tenecteplase.

Methods: Prospective observational study on consecutive ischemic stroke patients>18 years arriving in MES Medical College treated with tenecteplase based on inclusion criteria and data analysed with SPSS.

Results: Out of the 19 patients thrombolysed with tenecteplase the mean NIHSS at arrival was 11. Major improvement in NIHSS and mRS scores were observed to be 26% and 47% respectively. Only one patient had symptomatic bleed accounting to 5% of bleeding risk. Significant improvement in mean mRS scores in the moderate strokes when compared to the higher degree strokes but in this study poorer response to tenecteplase with advancing age was observed.

Conclusion: Tenecteplase is a safer, faster, and cost effective thrombolytic agent in acute ischemic stroke and is as much suited for the rural setting, as for the urban ones. It is quintessential in this era of endovascular care that more studies come out especially from rural centres.

Acute Management

Assessment of Outcome After Decompressive Craniectomy - Acute Management

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Background: Decompressive craniectomy is a crucial treatment entity in acute malignant strokes. Early aggressive intervention helps in better prognosis and quality of life.

Aim: To identify associated risk factors and understand the long – term outcome and quality of life of patients undergoing Decompressive craniectomy.

Methods: This is a prospective and retrospective studied of patients undergoing Decompressive Craniectomy during the period of January 2017 and January 2020. Demographics of the patients and risk factors are noted. Radiological features with serial imaging are collected. Functional outcomes measured with NIHSS scores, Glasgow coma scale (GCS), modified ranking Scale and, Barthel's index at 3 months, 6 months and 1 year. Multivariate logistic regression analysis was done for independent variables for outcome.

Results: About 93 patients studied, mean GCS 11.77 and mean NIHSS score of 13.65. Among them 70 males and 23 females. Diabetes and Systemic hypertension are more commonly associated risk factors. Eighty – one involved middle cerebral artery region and rest had cerebellar stroke undergoing DC. Thirty – three patients underwent DC within 48 hours, while 38 patients got operated after 48 hours. Mortality occurred in twenty – two patients, at admission and during follow up at 3- and 6-month.

Conclusion: Decompressive craniectomy can produce favourable outcome and morbidity in patients with malignant strokes. Only few studies are reported worldwide and not much from developing country like India. We encourage more studies to understand the benefits and effectiveness of the surgery.

Acute Management

Incidence of New Onset Fever, Fever Burden, Causes and Outcomes in Patients with Ischemic Stroke – Study in a Tertiary Care Neurological ICU

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Background: Stroke is one of the leading cause of morbidity and mortality. Fever is common in patients with acute ischemic stroke admitted to intensive care unit (ICU) and is associated with increased length of ICU and hospital stay and overall mortality.

Aim: To determine incidence, risk factors and outcomes associated with fever in patients with first ever acute ischemic stroke.

Methods: The study was carried out in a tertiary care hospital neurology ICU (NICU) between May 2019-May 2020. Study has the Institutional Ethics Committee approval. Patients were categorized into three groups based on the maximum temperature and fever burden: low, moderate and severe. The data collected included: demographic details, GCS, APACHE-IV, NIHSS score, need for ventilation, number of ventilator days, length of NICU and hospital stay, 30-day mortality and functional outcome at 90 days (mRS score).

Results: 184 patients were included. Mean age was 61.39yrs(25yrs-87yrs) and 130 (70.65%) were males. Fifty-four(29.34%) patients had new-onset fever. Moderate to high grade fever and fever burden was associated with higher 30-day mortality. Central fever was the cause in 21(38.8%) patients and NICU acquired infections were the cause in 33(61.11%). Risk factors for new-onset fever on univariate analysis were lower GCS at admission ($p< 0.01$) and higher NIHSS score ($p < 0.01$). A strong relationship was noted between APACHE IV and fever. Fever was associated with need for mechanical ventilation ($p <0.05$), increased length of NICU ($p <0.0001$) and hospital stay ($p <0.0001$). Functional outcome at 90-day was significantly poor in patients with fever (mRS 2-6 vs. mRS 0-1; $p<0.0001$). Pearsons correlation showed strong correlation between length of ICU stay in patients with moderate to high grade fever ($R2=0.279$, $p<0.01$) and fever burden ($R2=0.829$, $p<0.01$). A positive correlation was also noted between length of hospital stay and moderate to high grade fever ($R2=0.319$, $p<0.01$) and fever burden ($R2=0.694$, $p<0.01$). 30-day mortality was higher in patients with new-onset fever ($p<0.01$) and more so with high grade fever ($p<0.01$). There was a positive correlation between 90 day mRS and moderate to high grade fever ($R2=0.712$, $p<0.01$) and fever burden ($R2=0.32$, $p<0.01$).

Conclusion: Moderate to high grade fever and fever burden was associated with increased length of NICU and hospital stay, 30 day mortality and 90 day mRS

Acute Management

Comparing Bridging Thrombolysis With Direct Thrombectomy Within 4.5 Hours From Onset of Ischemic Stroke Due to Large Vessel Occlusion- Indian Experience

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Background: Intravenous thrombolysis (IVT) alone has poor recanalization rates in ischemic stroke due to large vessel occlusion (LVO). Thrombolysis followed by mechanical thrombectomy (bridging thrombolysis) has evolved rapidly as a standard treatment approach in emergent LVOs. Patients who undergo thrombectomy have a higher probability of favorable outcome irrespective of use of prior intravenous thrombolysis.

Aim: To compare bridging thrombolysis with direct thrombectomy in ischemic stroke due to LVO.

Methods: We included patients from our stroke registry, with ischemic stroke due to LVOs presenting within 4.5 hours from onset. Bridging thrombolysis was the standard treatment approach. Direct thrombectomy was done in patients with contraindications to IVT. Primary outcome was modified Rankin scale at 3 months. Secondary outcomes were NIHSS at 24 hours post procedure, door to puncture time, puncture to recanalization time, extent of recanalization achieved (mTICI) and number of passes required. Safety outcomes were any occurrence of intracranial hemorrhage, or other complications related to procedure or death.

Results: Total 76 patients were included, 29 underwent bridging thrombolysis and 47 underwent direct thrombectomy. Favorable outcome (mRS 0-2) was achieved in 19 (65.5%) patients in bridging group and 25 (58.1%) patients in direct group and there was no statistical difference between two groups. There was no significant difference in any of the secondary outcomes as well. Symptomatic ICH occurred in 2 (2.6%) patients and total 10 (13.9%) were dead at 3-month follow-up, comparable in both groups.

Conclusion: Direct thrombectomy has comparable outcomes to bridging thrombolysis in emergent large vessel occlusions.

Acute Management

Study on Outcome of Acute Ischemic Stroke Treated with Alteplase Vs Placebo Group at Tertiary Care Hospital Salem

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Background: Stroke is a major cause of mortality and morbidity. Majority of the patient presents with ischemic stroke. Thrombolysis for AIS is a key intervention that can reduce disability from stroke. Intravenous alteplase (recombinant tissue plasminogen activator) is the approved thrombolytic agent indicated for acute ischemic stroke. NINDS Study Group showed that patients of AIS treated with alteplase) were at least 30% more likely to have minimal or no disability at 3 months. Hence, Current research aimed to study outcome of patients treated with alteplase in acute ischemic stroke vs placebo group.

Aim: To study outcome of patients treated with alteplase in acute ischemic stroke with non thrombolysed patients. Duration of the study:1 Year

Methods: Prospective and Retrospective Observational study of patients admitted in GMKMCH, Salem, Neurology/ Medicine department who fulfilled inclusion and exclusion criteria.

Results: In thrombolysed patients- out of 25 patients-8 patients improved within 24 hours, 4 patients improved within 7 days and 7 patients within 1 month (total -19) .5 patients not improved.1 patient-deteriorated with heamorrhagic transformation. In non thrombolysed patients- out of 25 patients-8 patients improved within 1 month and 7 patients improved within 3 months(total-15), 10 patients not improved.

Conclusion: In comparative study, between thrombolysed and non thrombolysed patients, patients with moderate stroke have better disability benefit with early intervention like thrombolysis than non thrombolysis.

Acute Management

Does Thrombus Imaging Characteristics Predict The Degree Of Recanalisation After Endovascular Thrombectomy In Acute Ischaemic Stroke?

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Background: Identification of computed tomography (CT) thrombus imaging characteristics can predict the degree of recanalisation after endovascular thrombectomy (EVT) in patients with acute ischemic stroke and large vessel occlusion.

Aim: We assessed the thrombus characteristics on CT brain and CT angiography and correlated with the degree of recanalization and functional outcome after EVT.

Methods: We evaluated the thrombus imaging characteristics (hyperdense MCA sign, thrombus location and length, thrombus permeability) from thin slice CT and CT angiogram. In addition, groin to recanalisation time, number of passes, and EVT technique were documented. The primary outcome was degree of recanalisation (mTICI score) and secondary outcome was modified Rankin scale (mRS) at 3 months (good outcome mRS 0-2).

Results: Of the 102 patients, the mean age was 60.5±11.8 years. Patients with hyperdense MCA sign (90 % vs 75%, p=0.07) and good thrombus permeability (86% vs 70%, p=0.09) had better recanalization (mTICI grade 2b,2c or 3). Those who required more than 2 passes (38 % vs 9.5 %, p= 0.001) and those who required multimodal procedure of combined EVT with aspiration (36 % vs 9.5 %, p=0.002) had a poor recanalization, which was statistically significant. A groin to recanalisation time >60 minutes (66% vs 44%, p=0.03) and >2 passes (76 % vs 43 %, p=0.003) were associated with a poor 3 month outcome.

Conclusion: Thrombus imaging characteristics did not predict the degree of recanalisation in our study. The requirement of more than 2 passes during EVT was associated with poor degree of recanalisation and poor functional outcome.

Acute Management

Serum Ferritin Level in Patients with Acute Haemorragic Stroke and its Association with Outcome

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Background: Stroke is characterized by acute onset of focal nuerological deficit lasting 24 hours or longer. With the increasing incidence of haemorrhagic stroke in Indians, the use of biochemical markers like Ferritin can predict outcome.

Methods: This was a hospital based cross sectional observational study with 90 patients admitted into the Department of Medicine, JMCH since March 2021 till August 2021, more cases to be added in future. All the patients were subjected to investigations and inclusion and exclusion criteria.

Results: In this study the mean age group with Acute Haemorrhagic Stroke was >60 years. Of the total cases 57 were males (63.3%) and 33 female (37.7%). Hypertension was the most common risk factor associated present in 61 patients which is 67.8%. Limb weakness was the most common symptom and was present in 75% followed by headache which was present in 61.1% patients. The mean serum Ferritin value in patients of poor prognostic groupwas 445.29ng/ml.

Conclusion: In the study Serum Ferritin values were significantly higher 445.29 ng/ml (p value<.001) in poor outcome group and showed a positive correlation.

Intracerebral / Subarachnoid Haemorrhage

Clinical Profile of Hemorrhagic Stroke and Validation Of ICH Score in Kashmiri Population

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Background: Intracerebral hemorrhage is the second most common subtype of stroke after ischemic stroke and accounts for approximately 10 % to 20 % of all strokes worldwide. In contrast, hemorrhagic stroke in our Kashmir valley accounts for around 65%.

Aim: To look for detailed clinical profile and 30 day mortality, and correlate with ICH score, in our population.

Methods: In this hospital based prospective study, all patients of spontaneous intracerebral hemorrhage admitted over a period of 2 years were enrolled. All clinical and lab parameters were recorded. ICH score (which includes Age, GCS, ICH volume, ICH location, and Intraventricular hemorrhage) was calculated at initial assessment. Patients were followed for 1 month to look for 30 day mortality and correlate with ICH score.

Results: Intracerebral hemorrhage constituted 51% of stroke patients after excluding SAH. Mean age of patients was 61.66±12.57 years. There was male preponderance (64%). Major risk factors present include Hypertension (96%), smoking (47%). DM (10.1%), previous stroke (11.3%), Family history (29.2%) and Anticoagulant use (0.85%). Most common site involved was Putamen (46.5%) followed by thalamus (27.8%) and lobar hemorrhage (14.6%). Around 65% patients developed systemic complications including Electrolyte disturbances and infections. Mortality at 30 days in our study was 36.2%. Thirty-day mortality rates for patients with ICH Scores 0f 0, 1, 2,3,4,5 were 0.7%, 4.5%, 17.3%, 62.0%, 94.6% and100.0% respectively. Plotting ICH score ROC curves demonstrated an area under the curve of 0.896, compared to 0.92 for the original ICH score cohort.

Conclusion: Hemorrhagic stroke is still predominat stroke type in kashmir valley. ICH score is an accurate marker to predict 30 day mortality in our population.

Intracranial Disease

Hybrid Strategies for Management of Recurrent Symptomatic Intracranial Atherosclerotic Disease

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Background: Intracranial Atherosclerotic Disease (ICAD) is predominantly managed by optimal medical treatment. Recurrence still remains at 12% in the first year. This high-risk subgroup warrants advanced stroke prevention strategies.

Aim: We present our series of patients who failed medical treatment and subsequently treated by endovascular and surgical interventions.

Methods: We retrospectively analysed 18 of ICAD patients treated by endovascular and Surgical intervention between September 2016 and 2019. All patients failed optimal medical treatment and 7/18 had recurrent TIA and 11/18 had recurrent stroke. 15 of the ICADS were located in anterior and three in posterior circulation. Evaluation with MRI, MRA and CT Perfusion along with DSA was used for decision making.

Results: We did Submaximal Balloon angioplasty (SMBA) using under sized PTA balloon in Eight, stenting using appropriately sized balloon mounted stent or slightly over sized self-expanding stent in seven, STA-MCA bypass in two and EDAMS in one patient. Except for one proximal movement of stent post deployment no clinical events were recorded in the peri-procedural period. Patients were followed up for 12 months to 24 months using MRI in posterior circulation and CTP in anterior circulation. One patient following SMA, had recurrence with CTP deficit necessitating redo balloon angioplasty at 3 months. At 12 months, no clinical events were noted in any of the treated patients.

Conclusion: Medically refractory ICAD warrants revascularization procedure tailored for each individual patient. SMBA is effective with Intracranial stenting reserved for select patients. STA-MCA bypass and EDAMS have a role in extremely selected subset of patients.

Intracranial Disease

Clinical Study of Cerebral Ischemia in Moyamoya Disease from the View of Development of the Anterior Choroidal Artery

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Background: The anterior choroidal artery (AchA) is one of the collateral vessels in moyamoya disease (MMD).

Aim: The incidence of cerebral ischemia in MMD was analyzed through the association between development of the AchA and advancement of MMD stage.

Methods: Twelve patients of MMD with cerebral ischemia (infarction; 9 patients, transient ischemic attack; 3 patients) were enrolled. Advancement of MMD was evaluated using Suzuki's stage. The grades in Suzuki's stage were subclassified into a non-progressive stage for grades 1 and 2, and a progressive stage for grades 4 and 5. Dilatation of the AchA was judged as the presence of development of this artery. Development of the AchA was grouped into proximal type and proximal and distal type.

Results: Most frequent locations of infarcts were the anterior and parietal lobes in 6 patients each. Development of the AchA was confirmed on the ischemic side in all patients and on the non-ischemic side in 9 patients. Development of the AchA in the progressive stage was limited in the proximal and distal type on both sides. Development of the AchA in the non-progressive stage was the proximal type on the ischemic side.

Conclusion: The cause of cerebral ischemia was possibly associated with inadequate blood supply of the AchA in the non-progressive stage, and the lower blood flow from the internal carotid artery (ICA) in the progressive stage. Disparity between collateral blood flow from the AchA and the blood flow from the ICA was considered to relate to incidence of ischemia in MMD.

Intracranial Disease

Clinical Profile of Vascular Dementia Patients at SVPIMRS Ahmedabad

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Background: Vascular dementia is the second most common type of dementia, accounting for 15 to 20% of all cases of dementia. Vascular dementia is regarded as the most severe form of vascular cognitive impairment(VCI) characterized by the presence of clinical stroke or vascular brain injury as well as cognitive impairment. Common risk factors for both include hypertension, hyperlipidemia, hyperhomocystinemia, atherosclerosis, and diabetes.

Aim: To study clinical spectrum, risk factors and cognitive assessment in vascular dementia patients presenting at SVPIMRS, Ahmedabad.

Methods: Patients of any age and gender fulfilling NINDS-AIREN criteria for possible or Probable VaD.

Results: Out of 20 patients of VaD 5 patients had cortical, 7 had Subcortical and 8 had Cortical + Subcortical type of vascular dementia. The mean age of Vad patients was 62.7 years and M: F ratio was 3:1. Hypertension was observed in 16 patients (80%), DM in 7 patients (35%), Stroke in 10 patients (50%), Dyslipidemia in 6 patients (30%).16 (80%) patients had executive dysfunction, 11(55%) patients had behavior impairment and 6(30%) patients had parkinsonian features at the time of presentation. According to Addenbrookes cognitive examination 11(55%) patients had severe dementia.

Conclusion: In our study, cortical+subcortical type of VaD was more common. Executive dysfunction was the most common symptom at the time of presentation. VaD is potentially preventable by rigorous identification and treatment of cardiovascular disease risk factors.

Intracranial Disease

RNF213 as a Susceptibility Gene in Moyamoya Disease, Moyamoya Syndrome and Intracranial Atherosclerosis in Young Adults and Children in Malaysia

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Background: The variant p.R4810K (rs112735431) in ring finger protein 213 (RNF213) is strongly associated with moyamoya disease (MMD) in East Asians, including Chinese, Japanese and Koreans. Recent studies showed a weaker association between p.R4810K with moyamoya syndrome (MMS) and intracranial atherosclerosis (ICAS).

Aim: This study aimed to determine the presence of p.R4810K in patients with MMD, MMS and ICAS in a multi-ethnic Malaysian population.

Methods: A case-control study involving 9 MMD, 12 MMS, 15 ICAS patients and 45 controls, was conducted. The p.R4810K genotype was determined by TaqMan SNP genotyping, with positive cases further confirmed by Sanger sequencing. Clinical data was collected, and high-resolution magnetic resonance vessel wall study was also performed.

Results: Among 7 Chinese MMD patients, 2 (28.57%) carried the p.R4810K variant. Both were heterozygous (GA), and one of them is female. The remaining MMD (5 Chinese and 2 Malays) and all 12 MMS patients had wild-type (GG) genotype. All ICAS patients and controls had GG genotype only. The most common imaging features in MMD were terminal ICA, proximal MCA and proximal ACA stenosis with concentric wall thickening and mild/moderate vessel wall enhancement as well as presence of collaterals.

Conclusion: To our knowledge, this was the first study performed in a multi-ethnic population to investigate RNF213 p.R4810K. In our cohort, it was present in 2 out of 7 Malaysian Chinese MMD cases. This variant was not found in Malay, Indian or control cases. Further research with a larger sample size is required based on these preliminary findings.

Intracranial Disease

Clearing the Smoke off Moyamoya: The Mechano-biological Theory

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Background: Moya-moya angiopathy (MMA) affects the distal internal carotid artery and is designated as moyamoya disease (MMD) when predisposing conditions are absent, or moyamoya syndrome (MMS) when it occurs secondary to other causes.

Aim: The authors aimed to investigate the reason for this anatomical site predilection of MMA. There is compelling evidence to suggest that MMA is a phenomenon that occurs due to stereotyped mechanobiological processes. Literature regarding MMD and MMS was systematically reviewed to decipher a common pattern relating to the development of MMA.

Methods: A systematic review was conducted to understand the pathogenesis of MMA. Imaging data of patients with unilateral MMA were analysed. A computational fluid dynamics (CFD)-based simulation was performed.

Results: The literature search yielded 44 published articles on MMD by using keywords classified under the six key factors, namely “arterial tortuosity,” “vascular angles,” “wall shear stress,” “molecular factors,” “blood rheology/viscosity,” and “blood vessel wall strength”. A higher and variable cavernous-supraclinoid angle was noted. CFD analysis revealed a higher WSS occurring at the ICA bifurcation, in a ICA model that was modified to increase the cavernous-supraclinoid angle.

Conclusion: The authors have proposed a unifying theory for the pathogenesis of MMA. The moyamoya phenomenon appears to be the culmination of an interplay of vascular anatomy, hemodynamics, rheology, blood vessel wall strength, and a plethora of intricately linked mechanobiological molecular mediators that ultimately results in the mechanical process of occlusion of the blood vessel, stimulating angiogenesis and collateral blood supply in an attempt to perfuse the compromised brain.

Intracranial Disease

Markers and Their Correlation with the Severity of Early Stages of Cerebral Venous Thrombosis – Hospital Based Prospective Clinical Study

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Background: Cerebral vein thrombosis is a rare but serious cause of acute stroke. It occurs frequently between 20 and 50 years of age and is three times more common in women. Venous stasis, endothelial damage, genetic and acquired prothombotic factors and inflammation are the most commonly implicated factors.

Aim: To evaluate high sensitivity CRP, ESR, NLR, PLR and MHR in CVT patients and to correlate with severity and nature of the disease.

Methods: Clinical prospective study on 50 CVT patients between February to August 2020.Patients were analysed based on presence or absence of parenchymal lesions and number of involved sinuses. NIHSS and MRS score were used at admission. MRI, MRV were done. Laboratory investigations included complete hemogram, HDL, bilirubin, CRP, ESR. The NLR, PLR, MHR ratios were calculated and compared.

Results: All the patients enrolled in the study had higher ESR, NLR of >=2, while 92% (46) patients had high CRP. While high HDL cholesterol levels were found only in 12 patients (24%),48%(24 cases) had PLR of more than the normal range. Almost 92% of the cases (46 cases) had MHR >=7.3 with around 1/3rd (18 cases) having a MPV of >12.3.

Conclusion: This study suggests that NLR, PLR, MHR, CRP, ESR, MPV can be used in clinical practice for prediction of CVT in suspected patients as they are inexpensive parameters and widely available. Higher values of NLR, PLR, MHR, CRP, ESR, MPV were associated with increased clinical severity evidenced by low GCS, severe NIHSS score and MRS>3.

Prognosis/Outcome of Stroke

Anterior Choroidal Artery Infarction: Clinical Spectrum, Risk Factors, Etiological Sub Types, Radiological Findings and 90 Days Outcome

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Background: Anterior choroidal artery (AChA) infarction is extremely rare. Literature showed only few case reports and case series studies worldwide.

Aim: To know the risk factor, etiological subtype, clinical characteristics, radiological profile and outcome of patients with AChA infarction in these subset of Asian population.

Methods: It was a cross sectional 12 months, case series study with outcome assessed at 3 months. A proforma was created to collect data that included demographic profile, vascular risk factors, clinical features, radiological features and outcome. Etiological classification was done using TOAST subtype. All patients underwent brain MRI and angiogram. Outcome was assessed using modified Rankin scale (MRS) at 3 months.

Results: A total of twelve cases were diagnosed with AChA infarction, out of which 8 were males. Mean age was 45.6±12.65 years. Hypertension (77.7%) was the major risk factor. Incomplete clinical forms of AChA syndrome occurred in majority (66.6%). Lacunar stroke occurred in 3 cases (33.3%) while majority had non lacunar stroke (66.6%).7 cases (58.3%) had involvement of both superficial and deep branches of AChA . Posterior limb of internal capsule (PLIC) was affected in all cases. Outcome at 3 months was good (MRS ≤2) in majority (88.8%).

Conclusion: Complete clinical forms (hemiplegia, hemianopia, hemianesthesia) of AChA infarction are uncommon. While assessing a patient with hemiplegia, AChA infarction should be kept in mind. PLIC involvement is a radiological clue for AChA infarction. A higher proportion of non-lacunar stroke were observed with good functional outcome at 3 months.

Prognosis/Outcome of Stroke

Efficacy and Safety of Anticoagulation in Cardioembolic Stroke with Cerebral Microbleed

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Aim: We investigated the efficacy and safety of oral anticoagulants (OACs) versus antiplatelet therapy for the reduction of stroke recurrence in patients with both cardioembolic ischemic stroke (CIS) and cerebral microbleeds (CMBs), particularly in patients with severe CMB patterns (multiple and lobar CMBs).

Methods: A total of 583 patients with acute CIS and CMB were enrolled in this cohort study. The primary outcome measurement was the recurrence of stroke (ischemic or hemorrhagic) over the following two years.

Results: Patients treated with OACs had a significantly lower risk of stroke recurrence (hazard ratio [HR]: 0.49; 95% confidence intervals [CI]: 0.28–0.86; P=0.014) than those treated with antiplatelet therapy after adjusting for confounders. The risk of recurrent ischemic stroke was significantly lower in the OACs group than in the antiplatelet group, whereas the risk of hemorrhagic stroke was similar between groups. Stroke risk was the lowest in patients taking non-vitamin K antagonist oral anticoagulants (NOACs) and was similar between the OAC and antiplatelet groups in patients with exactly one CMB or deep/infratentorial CMB. However, OACs were significantly associated with reduced stroke risk in patients with multiple (HRs 0.44; 95% CI, 0.22–0.86; P=0.017) or lobar CMBs (HRs 0.44; 95% CI, 0.21–0.92; P=0.031).

Conclusion: Our results indicate that for the secondary prevention of stroke in patients with CIS and CMB, the clinical benefits of OACs can outweigh the risks in comparison to antiplatelet therapy. The net benefits of OAC therapy may be particularly pronounced in patients with multiple or lobar CMBs.

Prognosis/Outcome of Stroke

Outcomes of Stroke Patients Undergoing Thrombolysis in Sri Lanka; An Observational Prospective Study From A Low-middle Income Country

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Background: Stroke related deaths are relatively higher in low, middle-income countries where only a fraction of eligible patients undergo thrombolysis. There is also limited evidence on post-thrombolysis outcomes of patients from Asian countries.

Aim: This is a single center prospective observational study to describe the outcomes of a cohort of patients that underwent thrombolytic therapy over a 24-month period and to identify demographic, clinical, haematological, biochemical, imaging and treatment (low vs. high dose alteplase) related factors associated with a better outcome.

Methods: Demographic, clinical and imaging data of all patients were recorded prior to thrombolysis, within 24-hours post-thrombolysis and at 3-months follow up. Incidence of symptomatic intracranial haemorrhages and all-cause mortality by 3 months was also recorded.

Results: Eighty-nine patients (males – 61, 69%, mean age: 60 years ± 12.18) were recruited. Time from symptom onset to reperfusion was 174 minutes ± 56.50. Ten (11%) patients died and 19 (21%) developed symptomatic intracranial haemorrhages by 3 months. Functional independence at 3 months (measured by Barthel index, National Institutes of Health Stroke Score – NIHSS, or modified Rankin scale - mRS) was independently associated with NIHSS on admission ($p<0.05$). Thrombolysis with low dose alteplase was associated with better NIHSS or mRS scores ($p<0.05$) at 3 months compared to standard dose.

Conclusion: On admission NIHSS is predictive of functional independence at 3 months and reducing the time from symptom onset to thrombolysis, may further improve outcomes. The preliminary observations on low dose alteplase efficacy must be confirmed by a randomized controlled trial in the local population.

Prognosis/Outcome of Stroke

The Burden, Correlates and Outcomes of Left Ventricular Hypertrophy Among Young Africans with First Ever Stroke in Tanzania

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Background: Left ventricular hypertrophy (LVH) is a pathophysiological response due to chronic uncontrolled hypertension.

Aim: We aimed to investigate the magnitude, correlates and outcomes of LVH as a surrogate maker for chronic uncontrolled hypertension in young strokes. We also aimed to determine the accuracy of electrocardiography in detecting LVH compared to echocardiography.

Methods: This cohort study recruited young strokes who had undergone brain imaging, electrocardiography and transthoracic echocardiography. The modified Poisson regression model examined correlates for LVH. The National Institute of Health Stroke Scale assessed stroke severity (NIHSS) and the modified Rankin Scale assessed outcomes to 30-days.

Results: We enrolled 101 young strokes. Brain imaging revealed ischemic strokes in 60 (59.4%) and those with intracerebral hemorrhage 33 (86.8%) were localized in the basal ganglia. LVH was present in 76 (75.3%), and 30 (39.5%) and 28 (36.8%) had moderate or severe hypertrophy. Young adults with premorbid or new diagnosis of hypertension were more likely to have LVH, 47 (61.8%), and 26 (34.2%). On multivariable analysis, LVH was independently associated with not being on anti-hypertensive medications among hypertensives participants {RR 1.4 (95%CI:1.04–1.94). The mean NIHSS was 18 and 30-day mortality was 42 (43.3%). The sensitivity and specificity for Sokolow-Lyon in detecting LVH was 27% and 78%, and Cornell was 32% and 52% respectively.

Conclusion: We identified a high proportion of LVH in young adults with stroke associated with chronic undertreated hypertension coupled with a high 30-day mortality. We recommend low cost interventions like blood pressure screening and treatment to reduce this burden.

Prognosis/Outcome of Stroke

Evaluation of Neutrophil To Lymphocyte Ratio in Ischemic Stroke Subtypes

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Background: Increasing evidence supports Neutrophil-to-Lymphocyte ratio(NLR) in predicting stroke severity, disability, and mortality. It is cheap and routinely done, but underutilized marker predicting prognosis.

Aim: We studied the association of NLR among the ischemic stroke subtypes and with severity of stroke.

Methods: We included 69 patients of acute ischemic stroke presented during the study duration and were classified according to TOAST and severity of stroke assessed on the basis of NIHSS at the time of admission. NLR was calculated from the samples taken within 24 hours of symptom onset and was correlated with stroke severity and stroke subtypes.

Results: Significant association was seen between NLR and stroke severity (p value <.05). Median(IQR) of NLR in severe cases were 7.1(4.03-7.698) which was significantly higher as compared to others. The area under the ROC curve for NLR in predicting severity of stroke was 6.07(AUC 0.764; 95% CI: 0.647 to 0.858). If NLR was >6.07, then there was 90.90% probability of moderate/severe stroke and with mild stroke, 93.10% of them had NLR<=6.07. Significant association was seen in NLR with subtype of stroke (p value <.05). Median(IQR) of NLR in embolic stroke was 4.75(2.95-8.2) which was significantly higher as compared to other subtypes.

Conclusion: At a Cut off six, NLR has higher specificity and moderate sensitivity in predicting severity of ischemic stroke. NLR in embolic stroke was higher as compared to other subtypes.

Prognosis/Outcome of Stroke

Clinical outcomes of radiation-induced carotid stenosis

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Background: Clinical outcomes of radiation-induced carotid stenosis are still unclear.

Aim: Therefore, this study is aimed to evaluate the short-term and long-term outcomes after surgery for radiation-induced carotid stenosis.

Methods: PubMed, EMBASE, the Cochrane Library and Web of Science were searched for relevant RCTs and observational studies which reported short- and long- term outcomes after carotid endarterectomy (CEA) and carotid angioplasty and stenting (CAS) for carotid stenosis induced by radiation, and examination of grey literature were also conducted by independent reviewers. Only studies conducted from 1 January 2000 to 1 January 2020 and published in English were included. Risk of bias were assessed through different scales according to study design. I2 statistic were used to evaluate the heterogeneity, and meta-regression and sub-group analysis were performed to investigate the source of heterogeneity. Visual inspection of funnel plots and the Egger's test were used to judge publication bias.

Results: A total of 26 studies with 1002 patients were included. CEA was performed in 364 patients and CAS in 638 patients. The estimated rate of short-term stroke was 0.19% (95% CI=0-0.90%), and the rate of long-term stroke was 2.68 % (95% CI=1.19-4.57%). The rate of CNI in CEA group was significantly higher than that in CAS group [risk ratio (RR)=6.03, 95% CI=1.63-22.22, P=0.007)], however, there was a tendence of decreasing year after year. The univariate meta-regression analysis showed that the risk of stroke in CAS group were significantly higher than CEA group in both short-and long term [incidence rate ratio (IRR) =3.62, 95% CI=1.21-10.85, P=0.22; IRR=2.95, 95% CI=1.02-8.59, P=0.046), respectively].

Conclusion: This study provided the worldwide profile of outcome of treatment for radiation-induced carotid stenosis, and also found that CEA can yield better results for these patients than CAS. Nonetheless, as large-scale studies have not yet been conducted, and there is a definite need for further research studies in the future.

Prognosis/Outcome of Stroke

Influence of First-pass Effect on Recanalization Outcomes in the Era of Mechanical Thrombectomy

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Aim: This study summarized the current literature to compare the safety and efficacy between first-pass effect (FPE) and multiple-pass effect (MPE) for thrombectomy in treatment of acute ischemic stroke (AIS)

Methods: Major databases were searched for studies which reported clinical outcomes regarding successful or complete recanalization after first pass of mechanical thrombectomy in AIS. The assessment of bias was performed using different scales. I2 statistic was used to evaluate heterogeneity between reviewers. Subgroup, meta-regression and sensitivity analyses were conducted to explore the source of heterogeneity. Visualization of funnel plots was used to evaluate publication bias.

Results: A total of 9 studies were eligible for final analysis. For successful recanalization (mTICI 2b-3), favorable outcomes were seen in 49.7% (95% confidence interval (CI): 40.5-58.9%) and 34.7% (95% CI: 26.8-42.7%) of FPE and MPE patients, respectively. Mortality at 3 months was 13.8% (95% CI: 10.8-16.9%) and 26.0% (95% CI: 17.7-34.2%), respectively. For complete recanalization (mTICI 2c-3), proportion of favorable outcomes were 62.7% (95% CI: 51.2-74.2%) and 47.7% (95% CI: 37.4-58.0%) in FPE and MPE; mortality was seen in 11.5% (95% CI: 4.9-18.2%) and 17.0% (95% CI: 5.2-28.7%), respectively. For AIS with successful recanalization, FPE had more favorable outcome (odds ratio (OR): 1.85, 95% CI: 1.48-2.30; $p < 0.01$; $I2 = 0\%$) and lower mortality than MPE (OR: 0.58, 95% CI: 0.42-0.79; $p = 0.001$; $I2 = 61.9\%$). Similar results were seen in a subgroup analysis of patients with complete recanalization, with FPE having better outcome (OR: 1.79, 95% CI: 1.40-2.28; $p < 0.01$; $I2 = 0\%$) and lower mortality risk (OR: 0.61, 95% CI: 0.44-0.86; $p = 0.005$; $I2 = 0\%$) compared to MPE.

Conclusion: FPE is associated with better outcomes than MPE after achieving successful or complete recanalization.

Prognosis/Outcome of Stroke

Risk Factors for New Ischemic Cerebral Lesions after Carotid Artery Stenting

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Background: New ischemic cerebral lesions (NICL) are commonly occur after carotid artery stenting (CAS) with an incidence rate ranging from 18 to 58% and are detected by diffusion-weighted imaging-magnetic resonance imaging (DWI-MRI). Numerous studies have reported that NICL could increase the risk of future cerebrovascular events and cognitive impairment.

Aim: This study aimed to identify risk factors for NICL after CAS.

Methods: Relevant literature reporting risk factors for NICL after CAS were searched. Randomized controlled trials, case-control studies, or cohort studies were included in accordance with the pre-specified eligibility criteria. The risk of bias was assessed using the Cochrane Collaboration criteria and the quality of evidence was assessed with the corresponding scale. Data were analyzed using the RevMan V. 5.3 analysis software.

Results: The final analyses included a total of 21 studies and 1,907 participants, including 764 NICL-positives and 1,143 NICL-negatives. Determinants for NICL-positivity were age (mean deviation (MD): 2.60; 95% confidence interval (CI): [1.53-3.68]), symptomatic carotid lesions (odds ratio (OR): 1.77; 95% CI: [1.39-2.25]) and smoking (OR: 0.74; 95% CI: [0.58-0.94]). For symptomatic patients, risk factors for NICL-positive included diabetes mellitus (OR: 1.76; 95% CI: [1.09-2.82]), but smoking (OR: 0.54; 95% CI: [0.31-0.93]) was a protective factor. Risk factors for centers with high NICL incidence were age (MD: 2.05; 95% CI: [0.93-3.17]) and symptomatic carotid lesions (OR: 1.77; 95% CI: [1.29-2.45]).

Conclusion: Older age and symptomatic carotid lesions are associated with an increased risk of post-CAS NICL whereas smoking is associated with a decreased risk. Risk factors for NICL in symptomatic patients is diabetes mellitus, while those for patients at centers with high incidence are age and symptomatic carotid lesions.

Prognosis/Outcome of Stroke

Post-stroke Functional Outcome in Patients with Small Vessel Disease Based on Total SVD Score

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Background: Cerebral small vessel disease (SVD) is frequently observed in MRIs of ischemic stroke patients. White matter hyperintensities, lacunes, cerebral microbleeds and enlarged perivascular space are neuroimaging markers of SVD which are associated with incident stroke, recurrent stroke and cognitive impairment. In addition,SVD portends unfavorable functional outcome after ischemic stroke.

Aim: To study the effect of cumulative SVD burden on the 3-month functional outcome after ischemic stroke using the total SVD score.

Methods: 180 patients admitted between november 2019 to october 2020 with stroke onset and confirmed on MRI were evaluated. NIHSS score at admission, pre-stroke mRS score and mRS score at three months after stroke were collected prospectively. Demographic data and other risk factor variables for stroke were analysed using various statistical methods using SPSS software.

Results: Mean age was 60 years, and 62% were men. The distribution of total SVD score from 0 to 4 was 27%, 24%, 26%, 16%, and 7%, respectively. The proportion of mRS scores 2 or greater was 16% and 47% in total SVD score 0 and 4, respectively. Compared with the total SVD score of 0, total SVD scores of 2, 3, and 4 were independently associated with higher mRS scores. Lacunes, CMBs, WMHs but not EPVS were associated with mRS scores at 3 months.

Conclusion: An independent association between total SVD scores and functional outcome at 3 months following ischemic stroke were found. Total SVD score may be useful for stratification of patients who are at high-risk of unfavorable outcomes.

Prognosis/Outcome of Stroke

Deep Cerebral Venous Thrombosis – A Clinico-radiological Study

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Background: Cerebral venous thrombosis (CVT) is an uncommon cause of cerebrovascular disease and accounts for about 0.5% -1% of all strokes. Involvement of the deep cerebral venous system is still rare and accounts for about 10.9% of all CVT. The diagnosis is often delayed or missed due to variable clinical manifestations. Till date, very few series of deep CVT are reported.

Methods: We retrospectively (2015-18) and prospectively (2018-20) reviewed all the cases of CVT in a tertiary care center in south India. Out of a total of 52 CVT cases, 12 had involvement of deep cerebral venous system. Their clinical presentation, imaging characteristics and outcomes were assessed.

Results: The most frequent presentation was headache (91.6%), followed by seizures (33.3%). Hyperhomocysteinemia (50%) was the most common risk factor noted. Imaging characteristics were variable and a high index of suspicion was required for early diagnosis. 9 out of 12 patients (75%) had hemorrhagic infarctions and had involvement of the thalamus, temporal lobe or basal ganglia. 3 patients had unilateral thalamic involvement, which is rarely reported. Most patients were treated conservatively and had a favorable outcome (mRS 1-2 at 6 months follow up). 1 patient with posterior fossa involvement needed surgical decompression.

Conclusion: Our cohort highlights the importance of having a high degree of suspicion of CVT, having an early diagnosis and prompt initiation of treatment, which helps in reducing the morbidity and mortality. In cases of unilateral infarctions, a strong index of suspicion is needed for the diagnosis of deep CVT.

Prognosis/Outcome of Stroke

A Hospital Based Study of Post Stroke Infection

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Background: Patients after an acute stroke are at risk of developing many complications, of which the most common is Post Stroke Infection (PSI). PSI leads to increase in morbidity and mortality, with also an increase in hospital and health related expenditure.

Aim: To study the profile of post stroke infection in the hospital

Methods: This is a hospital based prospective study, carried out in a teaching hospital in North-East India, for a duration of one year. Inclusion criteria: First time stroke patients of age more than 18 years. Exclusion criteria: Patients already having fever or on antibiotics on admission, patients with pregnancy, on chemotherapy, chronic kidney disease.

Results: PSI occurred in 46% of stroke patients. Urinary tract infection (UTI) was the most common (22.5%), followed by pneumonia (18.2%). The most frequent risk factors for PSI were increase age of the patient, high NIHSS on admission, presence of Diabetes mellitus, and history of alcohol consumption. The presence of dysphagia (independent of NIHSS), and the use of indwelling urinary catheter was associated with PSI. The most common organism isolated in UTI was Escherichia coli (36.6%), and in pneumonia was Klebsiella pneumonia (20.2%). There was presence of multidrug resistant organisms in 12.6% PSI.

Conclusion: The high rate of PSI, requires developing evidence based guidelines for adequate predictive, preventive and management strategies. Moreover the presence of multidrug resistance requires strict adherence to antibiotic policies. Strict glycemic control in diabetic patients, and restriction of alcohol is equally important.

Prognosis/Outcome of Stroke

Cerebral Ischemic Events in Patients with Atrial Fibrillation Treated with Oral Anticoagulants

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Aim: This study aimed to evaluate the cerebral ischemic events in patients with atrial fibrillation treated with oral anticoagulants.

Methods: We studied 92 consecutive patients with atrial fibrillation (AF) who had acute cerebral ischemic events during oral anticoagulants admitted from January 2015 to July 2019 in our hospital. Corresponding controls (n=13) were selected based on AF patients without cerebral ischemic events more than five years during oral anticoagulants. We examined the age, gender, risk factors (current smoker, hypertension, diabetes mellitus, hyperlipidemia, myocardial infarction, history of stroke, congestive heart failure, renal failure, CHA2DS2-VASC score), and oral anticoagulants.

Results: 46% cases of acute cerebral ischemic events were treated with non-vitamin K antagonist oral anticoagulants (NOACs). Other cases were treated with warfarin. The percentages of female, history of stroke, congestive heart failure, CHA2DS2-VASC score more than 4, and CHA2DS2-VASC score were significantly higher in cases of acute cerebral ischemic events.

Conclusion: The percentages of female, history of stroke, congestive heart failure, and high CHA2DS2-VASC score might be associated with acute cerebral ischemic events during oral anticoagulants.

Prognosis/Outcome of Stroke

Retrospective Analysis of Stroke in Covid-19 Patients in a Medical College Hospital in Chennai, South India

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Background: Retrospective analysis of stroke in hospitalized patients with SARS-COV 2 infection from January 2021 to June 2021.

Aim: To understand the presentation and outcome of stroke in COVID- 19 infection.

Methods: Single center retrospective case study. Data collected from hospital registry.

Results: Among 880 COVID-19 patients who were admitted from January 2021 to June 2021, 214 (24.3%) had neuro manifestations, 33 (3.75%) presented with stroke. In that 26 patients (78%) had Ischemic stroke, 7 (21%) had hemorrhagic stroke. Females were 14(44%) and 19(56%) were males. 30 patients (90.9%) had comorbidities. 3 (9.09%) had stroke as manifesting symptom. Stroke mostly occurred in second week of illness in 26 patients (86%). 30 patients (90.9%) presented outside the window period. Stroke patients had elevated inflammatory markers such as D-dimer, LDH & serum ferritin. Serial monitoring of decreasing inflammatory markers during hospital stay predicts good outcome in moderate to severe stroke patients. Antiplatelet and anticoagulant therapy was continued as indicated. 8 (24.24%) with moderate stroke recovered completely. 2 (6.06%) died during the illness.28 (87.8%) discharged with residual morbidity.2 patients (6.06 %) were shifted to other hospital for ECMO .18 patients were on regular follow-up with rehabilitation.

Conclusion: The incidence of stroke was high in COVID - 19 patients with co-existing illness.

Prognosis/Outcome of Stroke

A Clinico-etiological, Radiological Profile and Treatment Outcomein 238 Patients of Cortical Venous Sinus Thrombosis from a Tertiary Care Center

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Background: Cerebral vein and dural sinus thrombosis (CVT) are less frequent than other types of strokes and have a quite different clinical presentation and different etiological investigations. They rarely manifest as a stroke syndrome. The clinical features are rather diverse. CVTs are more challenging to diagnose than other types of stroke.

Aim: To describe the clinico-etiological, radiological profile and treatment outcome in 238 patients of CSVT.

Methods: This is prospective observational study was conducted in the department of neurology, Government General hospital, Guntur from January 2016 to July 2020 including a total of 238 patients.

Results: Most of the patients (61.3%) were males with male to female ratio was 1.6:1. The mean age was 36 years. Majority (63.8%) of patients reported with subacute presentation (48hrs-30days). Most common presentation being headache(94.95%),papilledema(61.7%) f/b vomiting and seizures. Common risk factors identified were alcoholism in 118 (49.5%), Hyperhomocysteinemia in 43 (18.06%), post-partum state in 25(10%), oral contraceptive pill (OCP) intake in 19 (8%).Most common sinus involved is superior saggital sinuses with or without other sinuses in 155 (65.1%) f/b Right TS in 83 (34.8%), Left TS 60(25.8%) and straight sinus in 28 (11.7%). The most common MRI finding in the present study is non-haemorrhagic infarction present in 78(53.06) f/b hemorrhagic infarct in 69 (46.9%), SAH is seen in 14 (5.8%) and SDH in 9 (3.7%) cases. 87 (79%) of cases has favourable outcome with mRS <2 at the time of discharge.

Conclusion: Patients with CVT are likely to present with diverse clinical presentation and male sex and young age at presentation is common. Alcoholism and Hyperhomocysteinemia are common risk factor/etiologies leading to CVT. Involvement of SSS and TS are common with non-hemorrhagic infarction as common MRI findings. Most of them had favourable outcome. Poor GCS score, deep venous involvement, multisinuses involvement was associated with poor outcome.

Prognosis/Outcome of Stroke

Comparison of Red Cell Distribution Width in Relation to Neurological Scoring System in Acute Ischemic Stroke- A Prospective Study

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Background: The red cell distribution width is a measure of the variation of red blood cell volume. It isthe parameter that is easily and inexpensively determined by automatic flow cytometry as a part of a complete blood count. The normal values of red blood cell distribution width range between 11.5% and 14.5%. The RDW is a measure of the variation of red blood cell volume and is used in the differentiation of anemia and high RDW values occur when there is wide variation in the morphology and size of the red blood cells.

Aim: The present study is to evaluate the association between RDW which was performed routinely in the central laboratory of our hospital and the MRS and NIHSS scores in patients who have had acute ischemic stroke. The main objective is to find out the association between red cell distribution width with National Institute of Health stroke scale and modified ranking scale in patients with acute ischemic stroke.

Methods: Patients with acute ischemic stroke Diagnostic by history physical examination CT brain MRI brain and patients with symptoms of stroke less than 24 hours was included in this study and the results were analyzed using SPSS software version 20.

Conclusion: Higher values of red cell distribution width as a predictor ischemic stroke higher values of red cell distribution width on admission is a predictor of poor prognosis for stroke

Prognosis/Outcome of Stroke

Watershed Infarcts-risk Analysis and Prognosis

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Background: Infarction of cerebral watershed areas, is generally attributed to hemodynamic mechanisms. Unilateral lesions are more common and often occur in association with severe carotid disease. The extent of infarction depends on the severity and duration of hypoperfusion, the location and severity of occlusive vascular disease, and the adequacy of collateral blood supply.

Aim: To study the etiological risk factors associated with watershed infarction and to study its prognosis

Methods: This is a prospective observational study which included 50 patients admitted to a tertiary care center for 8months from January 2021. After Institutional EC clearance, patients with watershed infarction on neuro-imaging (CT or MRI) were included in the study. Demographic data, clinical history, examination and etiological workup like Echocardigraphy, Carotid and Vertebral artery Doppler, CT/MR angiography were performed. NIHSS and mRS Scoring was done on the day of admission and 20days after the onset of stroke. Data was entered to a pre-formatted data sheet and analysed.

Results: The mean age of the included patients was 63.87years, 27(54%) patients were female, 29(58%) had significant carotid artery stenosis, 8(16%) patients had hypotension, 5 (10%) had atrial fibrillation and 3 (6%) patients had an increased hematocrit. On neuroimaging 12(24%) had bilateral watershed infarcts and the rest had unilateral watershed infarcts. The mean NIHSS and mRS at admission were 11.89 and 3.65 respectively which reduced to 7.12 and 2.88 after 20 days.

Conclusion: Watershed infarcts have distinct etiologic and pathogenic mechanisms, the early identification and correction of which could prevent disability

Prognosis/Outcome of Stroke

The Role of De Ritis Ratio (AAR Or Ast/ Alt Ratio) in Prediction of Outcome in Patients with Acute Ischemic Stroke

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Aim: This study aims at identifying the association of De Ritis score (AST/ALT ratio or the AAR) with the outcome of acute ischemic stroke.

Methods: This was a prospective study conducted at a tertiary care hospital in Kerala, over a period of one year, among patients with first episode of acute ischemic stroke (AIS), after obtaining consent from the institutional ethics committee. The demographic profile, risk factors, clinical features, NIHSS score, AST/ALT ratio (AAR/De Ritis score) at admission, were calculated. The outcomes at 3 months was assessed using the modified Rankin scale. NIHSS scores and mRS scores were compared between two AAR subgroups (value <1 and > 1) using the Pearson $\chi 2$ test (modified by Fisher's exact test).

Results: 320 patients were studied (mean age group 67.83 + 12, 60% males and 40% females). The mean De Ritis or AAR score was 1.32 + 0.59. The AAR values were <1, and >1 in subgroups 1, 2 respectively. In terms of NIHSS, the percentages of patients with a AAR subgroup 2 were 56.3%, 57.5%, 84.2%, and 81.8% in NIHSS subgroups 1–4, respectively (P=0.01). In terms of clinical outcome, the percentages of patients with a poor outcome at 3 months, as evidenced by m RS of > 3 were 18.3% and 81.8% in AAR subgroups 1–2, respectively (P=0.001). Patients with a poor outcome had a higher AAR (median =1.5).

Conclusion: An increased De Ritis ratio at admission is significantly associated with a poor outcome in AIS patients.

Prognosis/Outcome of Stroke

Pattern of Electrocardiographic Changes in Acute Ischemic Stroke and its Correlation with Outcome

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Background: Stroke is defined as rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin. The objectives were to study the pattern of electrocardiographic changes in acute ischemic stroke and to find the correlation of ECG changes with the outcome of patients with ischemic stroke.

Aim: To study pattern of electrocardiographic changes in acute ischemic stroke and its correlation with outcome.

Methods: Cross sectional observational study was conducted in 90 patients of acute ischemic stroke with detailed history, Imaging, ECG monitoring and blood investigations. Patients grouped as those with electrocardiographic changes and those without changes. Outcome was assessed by modified NIHSS score.

Results: mNIHSS score was higher in patients having ECG changes with median 12(9,21.5) for patient with changes,8(6-10) for patients without changes($p<0.0001$). In patients without ECG changes, score significantly improved from day 1 to 5($p<0.0001$) compared to patients with changes who doesn't show any improvement in score($p>0.05$). Maximum number of patients were having ECG change of T inversion(25.6%) and QTc prolongation(25.6%). Patients with ECG changes had poor outcome compared to those without any changes ($\chi 2= 14.943, df=2, p=0.005$).

Conclusion: Characteristics of ECG changes have important reference value in evaluation of severity and prognosis of ischemic stroke patients. Patients with ECG changes have poor prognosis.

Rehabilitation & Restorative Therapy in Stroke

Effect of Transcranial Direct Current Stimulation on Early Motor Recovery in Acute Stroke - A Randomized Controlled Trial

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Background: Transcranial direct current stimulation (tDCS) is a non-invasive, portable, easy to use and relatively inexpensive equipment to modulate cortical excitability. Neuromodulation by tDCS enhances synaptic plasticity. Use of tDCS in the acute period post stroke could improve brain plasticity and result in better motor recovery.

Aim: Measure the effects of tDCS on functional and sensory outcomes throughout the first year post onset of stroke.

Methods: 40 acute stroke patients were randomized and placed into either the treatment or sham group. Anodal tDCS was applied (2 mA, 20 min) 5 times a week during the first month post stroke. Patients were evaluated with the Wolf Motor Function Test, the Semmes Weinstein Monofilament Test, the Upper Extremity section (UEFM), the Lower Extremity section (LEFM) and the Somatosensory section of the Fugl Meyer Test, the Tardieu Spasticity Scale, the Stroke Impact Scale (SIS), the Hospital Anxiety and Depression Scale (HADS) and the Barthel Index. Evaluations were held at 48 h post stroke, week 1, 2, 3, 4, 3 months, 6 months and 1 year.

Results: There were statistically and clinically significant improvements after tDCS in all functional motor outcomes, and somatosensory functions. Differences between both groups for the main outcome (WMFT time) were 51% ($p = 0.04$) at one month, and 57% ($p = 0.02$) at one year.

Conclusion: tDCS seems to be an effective adjuvant to conventional rehabilitation techniques. If applied in the acute stages of stroke, functional recovery is not only accelerated, but improved, and results are maintained up to one-year post stroke.

Rehabilitation & Restorative Therapy in Stroke

Effects of Robot Assisted Therapy in Upper Limb Motor Recovery After Stroke

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Background: Rehabilitation Robotics is a promising new tool to alleviate the disability of persons suffering from stroke.

Aim: To study the efficacy of Robot Assisted Therapy over conventional rehabilitation programme in the management of upper extremity weakness in stroke patients.

Methods: Prospective randomised controlled study, done in the Physical Medicine and Rehabilitation department in Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi. Sixty four patients included in the study were divided in two groups. Thirty two subjects in control group received conventional rehabilitation programme and thirty two in study group additionally received Robot-assisted therapy for twelve hours spread over four weeks. Assessment of both the groups was done pre-treatment, at one month and at four months, using: 1. The Fugl-Meyer Assessment (FMA) score for upper extremity 2. Motor Activity Log (MAL) scale comprising Amount of Use (AOU) score and Quality of Use (QOU) score.

Results: The study group exhibited greater motor recovery on the FMA scores at 1 month(48.1) and 4 months(57) than the control group (41.43 and 45.23). The mean AOU scores in the study group at 1 month (15.8) and 4 months(19.96) were better than that of control group (11.33 and 13.86). The mean QOU scores at 1 month and 4 months in the study group were 14.41 and 19.23 and in the control group were 11.06 and 13.43 respectively. The differences in improvements were statistically significant.

Conclusion: Robot-assisted therapy is a safe and effective adjunct to conventional therapy for improving upper extremity function in stroke patients.

Rehabilitation & Restorative Therapy in Stroke

Development and Testing of Adherence-enhancing Strategies for Home-based Exercise Program Among Community-living Stroke Survivors

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Background: Adhering to prescribed home-based exercises is crucial for stroke recovery. However, no comprehensive strategies exist to facilitate exercise adherence post-stroke.

Aim: To develop and test adherence-enhancing strategies (AES) for home-based exercises among community-dwelling stroke survivors.

Methods: This study was conducted in four phases. Phase I was a cross-sectional study to estimate the level of exercise adherence among 92 stroke survivors. In phase II, we conducted semi-structured interviews to explore the factors affecting adherence to home exercises among ten stroke survivors. Phase III was an international Delphi consensus to develop the AES for home-based exercises specific to stroke. Phase IV was a randomized controlled trial to determine the effectiveness of the AES on the level of adherence, mobility, and quality of life in 52 stroke survivors.

Results: The results of the phase I showed that only 28% of participants were adherent to home exercises. In phase II, we found the factors that influenced exercise adherence were existing at individual, interpersonal, organizational, and community level. Phase III results led to the development of the framework for AES. In phase IV, the results showed that AES were effective in supporting adherence and mobility of stroke survivors but did not influence their quality of life at 6 and 12 weeks.

Conclusion: The AES have been developed and tested for supporting adherence to home-based exercises in community-dwelling stroke survivors. These strategies can be employed for clinical and research purposes to enhance the exercise adherence of stroke survivors, thus facilitating their recovery.

Rehabilitation & Restorative Therapy in Stroke

Bone Marrow Derived Mononuclear Stem Cells in Chronic Stroke: Functional Imaging & Spectroscopic Analysis

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Background: Bone marrow derived mononuclear stem cells (BM-MNCs) have shown great potential for clinical applications in regenerative medicine. However, it remains challenging to follow the transplanted cells in vivo. Proton nuclear magnetic resonance spectroscopy (H-NMR) is capable of determining and quantifying the cellular metabolites non-invasively.

Aim: The current study investigates paracrine mechanisms of intravenous BM-MNC infusion in chronic stroke using H-NMR spectroscopy.

Methods: Bone marrow derived mononuclear cells (MNC) were infused in fifteen (n=15) chronic stroke (mean age: 52.9 years, SD: 5.5) patients followed by 8 weeks of physiotherapy in one group and ten (n=10) patients served as controls in another group (mean age: 49.2 years, SD: 6.3). Clinical assessments with Fugl Meyer (FM), modified Barthel Index (mBI), MRC for power were done at baseline and 8 weeks. Serum samples were washed twice with phosphate-buffered saline (PBS) and adjusted to a concentration of 5x106 cells/mL. To 0.1 microlitre of the cell preparation, 30 microlitre of trimethylsilylpropionate (TSP) and formate in 240mL of deuterium oxide (D2O) were added. Cell suspensions were transferred to NMR sample tubes (Bruker) for 1H-MRS analysis. 2D, CPMG spectra were recorded using a NOESY-based pulse sequence (4s acquisition time, 1 s-relaxation time and 100 ms mixing time). After fourier transformation the spectra were phase and baseline-corrected manually.

Results: No adverse reactions were observed with stem cells infusion. Mean 58.3 x106 with 0.34% CD34+ mononuclear cells were infused intravenously. There was no significant difference in clinical scores in both the groups at 8 weeks in mBI (66.8 versus 64.3; p=0.62) & FM scores (38.2 vs 40.3; p=0.67). Elevated peaks of NAA, glutamate, glutamine (2.32ppm) and acetone (1.9 ppm) in one group and glucose (4.0 ppm) & lactate peaks were observed in the other group at 8 weeks (p>0.05)

Conclusion: H-NMR spectroscopy provides indirect evidence of release of neurotrophic growth factors infused by the stem cells and physiotherapy enhancing neurorestoration after stroke.

Rehabilitation & Restorative Therapy in Stroke

Influence of Exteroceptive and Proprioceptive Deficits on Motor Recovery Among Post-stroke Subjects: A Cross-sectional Study

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Background: Poststroke, exteroceptive and proprioceptive deficits are not uncommon. The impairments may be related to the recovery of the paretic upper limb.

Aim: To determine the association between the exteroceptive / proprioceptive deficits and the motor recovery of the affected upper limb in stroke.

Methods: Setting: NeuroRehab laboratory of a national level rehabilitation institute in a metropolitan city of northern India. Sample size: 34 Inclusion criteria: Age: 20 to 80 years; Hemiparesis (right or left); Ischemic or hemorrhagic stroke; 1 to 12 months after the stroke onset; sensory deficit of any of the sensory modalities. Exclusion Criteria: Complex regional pain syndrome; Diabetic or any other neuropathy; Skin disorder; Peripheral nerve injury of either of the upper limbs. Outcome measure: a)Nottingham Sensory Assessment (Erasmus MC modification of the revised version) (NSA) b)Semmes Weinstein Monofilament (SWM) c)Two-Point Discrimination (2-PD) c)Thumb Localization test (TLT) d)Fugl-Meyer assessment (Upper extremity) (FMA-UE). Intervention: Not applicable

Results: The scores of NSA, SWM and 2-PD was found to be significantly related ($r = 0.76$; $p < 0.05$) with that of the FMA- UE (wrist-hand). TLT was found to be significantly related ($r = 0.63$; $p < 0.05$) with the scores of FM-UE (upper arm).

Conclusion: The exteroceptive deficits such as light touch and tactile discrimination were inversely related with the recovery of the hand dexterity; whereas the proprioceptive impairment was associated with the proximal joint control of the paretic upper limb. In view of the relation, specific intervention should be planned in any stroke rehabilitation regime.

Rehabilitation & Restorative Therapy in Stroke

Novel Intervention for the Upper Limb Somatosensory Deficits in Stroke: An Rct

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Background: Poststroke, impaired proprioception and stereognosis sensation are crucial sensory dysfunctions leading to poor motor recovery. The deficits may lead to poor motor and functional recovery. The specific intervention for these deficits are lacking in stroke rehabilitation.

Aim: The aim of this study was to determine the effectiveness of an innovative intervention (neuroplasticity principles) for proprioception and stereognosis deficits on enhancing the upper limb recovery in stroke.

Methods: The subjects within one year of stroke duration exhibiting motor and proprioception and stereognosis impairments were included. The intervention included active proprioceptive and stereognosis training using the mirror-box and blindfolds through motor tasks. The sessions include 30 minutes, 40 sessions. The outcome measures were change in score of Fugl-meyer Assessment upper extremity (FMA-UE) (0 to 66), Nottingham Sensory Assessment– Stereognosis (NSA-S) (0 to 22), and Thumb localization test (TLT) (0 to 3).

Results: A total of 31 subjects (15 in experimental group and 16 in control group) were recruited in the investigation. The mean change for motor, proprioception and stereognosis measures was greater ($p<0.05$) in the experimental group (FMA-UE = 9.84, TLT = 2.72 and NSA-S= 8.04) when compared with that of the control counterparts (FMA-UE = 4.15, TLT = 0.91 and NSA-S = 2.17) after the training.

Conclusion: The novel intervention for proprioception and stereognosis deficits may enhance motor recovery among subjects with stroke. The regime may be incorporated in stroke motor rehabilitation.

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Rehabilitation & Restorative Therapy in Stroke

Physical Activity Promotion in Challenging Times - Development and Testing the Effectiveness of a Novel Physical Activity Promotion Program Among Community- Dwelling Stroke Survivors

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Background: Stroke survivors are at risk for second stroke and other cardiovascular disorders. Regular physical activity (PA) prevents recurrent stroke, improves cardiovascular health, and life expectancy post-stroke. However, stroke survivors demonstrate consistent low levels of PA despite proven health benefits. Interventions targeting PA in stroke have obtained inconsistent results.

Aim: To develop and test a comprehensive PA promotion program among stroke survivors living in India.

Methods: There were three phases in the present study. In phase I, through a multi- methods study we developed and validated a compendium of context-specific PA in 17 stroke survivors. In Phase II, we conducted a separate multi-methods study to develop and validate adaptive sports among 18 stroke survivors. In Phase III, we investigated the effectiveness of a comprehensive PA promotion program through a cluster randomized controlled trial in 4 community centers of Udupi Taluk, Karnataka. Eighty-four stroke survivors participated in the cluster RCT.

Results: Phase I results showed that context-specific activities are safe, feasible and help to improve PA levels in stroke survivors. Results of Phase II showed that adaptive sports are safe, feasible, and engross participation in PA. Results of Phase III showed significant improvements in the experimental group for mobility, quality of life, and PA outcomes.

Conclusion: Comprehensive PA promotion program is safe, feasible and improves mobility, quality of life, and PA among community-dwelling stroke survivors living in India.

Rehabilitation & Restorative Therapy in Stroke

Care Giver Burden in Stroke Survivors- A Comprehensive Study

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Background: Caring for stroke survivors can be burdensome. Comprehensive studies of care giver burden in stroke survivors are sparse.

Aim: This study was undertaken to assess caregiver burden and coping strategies of caregivers.

Methods: The clinical details, behavioural symptoms ('Neuropysychiatric inventory'), and mRS at the time of discharge of 118 stroke patients were collected. The care givers were interviewed, using 'Zarit burden interview'(ZBI),'BRIEF COPE scale'and Hospital anxiety and depression scale(HADS). SPSS v25 was used to analyze the data.

Results: The mean age of stroke survivors was 67.81 ± 11.88 years with 40.7% females and 59.3 % males. NIHSS scores were 1-4 (20.3%), 5-15(71.2%)16-20(4.2%) and 21-42 (4.2%). mRS of <2 was noted in 61% and >2 in 39%. Mean age of care givers was 54.32 years .82.2% of care givers were spouse and relatives ,17.8% were hired help. Mean ZBI score was13.85 ±8.89 and were significantly higher ($P < 0.001$) in those with financial constraints and who felt their health declined during care. Emotional and spiritual support topped the coping strategies. Statistically significant positive correlation between ZBI and total NPI severity ($r=0.419$, $p<0.001$) and total NPI disruption score($r=0.359$, $p<0.001$) was noted. Mean HADS score was 13.82 ±5.25. Positive correlation was noted between ZBI ($r=0.677$, $p<0.001$), total NPI disruption score ($r=0.453$, $p<0.001$), HADS score ($r=0.395$, $p<0.001$) with mRS score and NIHSS score.

Conclusion: We noted significant care giver burden among stroke survivors. There was a positive correlation between mRS, NIHSS and the care giver scales including ZBI, NPI and HADS. Our study felt the need of social support programs to assist caregivers to cope successfully.

Rehabilitation & Restorative Therapy in Stroke

Optimizing Stroke Care Services & Minimizing Disability, Challenging Stroke, Our 5 Year Experience at Indus Hospital, A Multispeciality Centre in Visakhapatnam

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Aim: Maximizing window of treatment, minimizing cost and encouraging community participation under specialist supervision.

Methods: 1.Information about availability of stroke revascularization at our center was disseminated as a first step 2.cost cut down was planned and implemented 3. Developed Stroke team and involved volunteers from families of stroke patients 4.Barthel index was used to assess ADL at 3 weeks and 6 months post stroke 5.Modified stroke rehab programme at hospital as outpatient was designed incorporating group counselling, recreational activities and occupational support

Results: n = 2324 (April 2016 to March 2021) 181 patients were thrombolysed with an average cost of hospitalization not exceeding re.86000/- per patient Mechanical thrombectomy was performed on 63 patients with average cost < re 3,50,000/- per patient In Patients of severe stroke (NIHSS >25) Barthel score of more than 80 were achieved in 56% with modified rehab plan whereas with home based rehab only 23 % achieved such improvements.

Patients with moderate stroke (NIHSS >9 and <25) did not show significant difference in the outcome with center based rehab or home based.

Conclusion: we at our center optimized human resources which are abundant and succeeded in meeting with the stroke challenge.

Others

Visual Processing Errors in Acute Ischemic Stroke

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Background: Acute ischemic stroke is one of the common neurological problem. A large portion of the central nervous system is dedicated to vision and therefore strokes have a high likelihood of involving vision in some way. The foundation includes oculomotor control, visual fields, and visual acuity. Second level is highest skill level of this hierarchy is visuocognition.

Methods: In 100 patients admitted in TVMCH with signs & symptoms of acute ischemic stroke detailed general clinical and neurological examination is done. Following visual functions are tested by higher cognitive evaluation 1)visual fields 2)Visual acuity 3)Colour vision 4)colour contrast 5)3D depth of vision 6)visual form recognition 7)General contrast sensitivity 8)Agnosias like prospagnosia, simultagnosia 9)Visual extinction. The visual processing errors identified are correlated with arterial territory involved.

Results: Out of 100 patients 64% had anterior circulation stroke & 36 % had posterior circulation stroke.28% had VFDs, 8% of patients had eye motility deficits ,10% had low VA and 20% had perceptual difficulties. Of the 28% VFDs complete HH (54%) represented the most frequent type of VFD. VFD 10%,VA 4% & Perception defects 8% were contributed by anterior circulation stroke. VFD 18%, VA 6% & perceptual difficulty 12% & eye motility 8% distributed among posterior circulation stroke patients.

Conclusion: In this study Visual field defects most common in posterior circulation infarcts followed by visual acuity noted in left occipital infarcts. Visual perceptual difficulty were more common with anterior circulation infarcts.

Others

Regional Differences in Post-discharge Stroke Care in India: A Qualitative Study

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Background: Stroke is the fourth leading cause of death and fifth leading cause of disability in India. Stroke rehabilitation can reduce mortality and improve outcomes, but India has limited resources to provide comprehensive stroke care after hospitalisation. Consequently, stroke survivors and family carers experience a range of challenges with long-term care and support. Secondary prevention and stroke rehabilitation services are important in post-discharge stroke care; however, there is insufficient information on post-discharge stroke services in India.

Aim: This study aims to explore the clinical staff perspectives of post-discharge stroke services across different regions of India.

Methods: Semi-structured interviews were undertaken with a purposive sample of health professionals from multidisciplinary stroke teams at the All India Institute of Medical Sciences, New Delhi (North), Baptist Christian Hospital (North-East), Sree Chitra Tirunal Institute for Medical Sciences and Technology (South) between July and August 2021. The interviews were conducted, translated, and transcribed by the research team. Data were analysed thematically using NVivo software.

Results: Twenty-six health professionals participated: 9 Nurses, 7 Doctors, 5 Physiotherapists, 2 Speech and Language Therapists, and 1 Social Worker, Dietician, and Palliative Care team member. Four themes were identified: Integrated Inpatient Discharge Care Planning; Patient and Caregiver Engagement; Post-Discharge Care and Support; Resources and Workforce.

Conclusion: Patient and caregiver engagement is an integral part of post-discharge processes; however, regional variation exists in the discharge planning, staff, resources, and services available for post-discharge support. Moreover, patient and caregiver challenges vary across geographical locations, educational backgrounds, financial status, family, and support networks.

Others

Clinical Staff Perspective of Post-discharge Stroke Care in North-east India

Koirala A, Webster JJ, Jones SP, Injety RJ

Baptist Christian Hospital, Tezpur, Assam, India

Background: Stroke is the fourth leading cause of death and fifth leading cause of disability in India. Often, Stroke survivors experience a range of disabilities and are cared for by their families long-term. Stroke rehabilitation along with secondary prevention reduces mortality, improves outcomes, and is important in post-discharge stroke care. However, there are very limited resources and a lack of information regarding post-discharge stroke services in India.

Aim: This study explores the key components and challenges of post-discharge stroke services with clinical staff.

Methods: Semi-structured interviews were undertaken with a purposive sample of health professionals representing the multidisciplinary stroke team from Baptist Christian Hospital (BCH) at Tezpur, Assam from July to September 2021. As a private charitable hospital, BCH serves populations that are economically weak and vulnerable, both suburban and rural, belonging to several ethnicities and tribes. The interviews were conducted, translated, and transcribed by the research team. Using NVivo software, data were analysed thematically, using an inductive approach.

Results: Six healthcare professionals participated: 2 stroke unit nurses, 1 doctor, 1 palliative nurse, 1 physiotherapist, and 1 dietician. Four themes were identified: Integrated Inpatient Discharge Care Planning; Patient and Caregiver Engagement; Post-discharge Care and Support; and Resources and Workforce.

Conclusion: Accessibility, affordability, and availability of a comprehensive multidisciplinary stroke team remain a challenge. Empowerment of the patient and caregivers during hospital stay and a system for providing post-discharge stroke care are some key needs identified. Stroke teleservices could facilitate post-discharge care and support for patients and caregivers in the community.

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Others

Clinical Staff Perspective of Post-discharge Stroke Care in North India

Sharma S, Padma MV, Jones S, PInjety RJ

All India Institute of Medical Sciences, New Delhi, India

Background: Stroke is the fourth leading cause of death and fifth leading cause of disability in India. Often, stroke survivors experience a range of disabilities and mostly cared for by their families long-term. Stroke rehabilitation and secondary prevention reduces mortality, improves outcomes, and is an important factor in post-discharge stroke care. However, there are very limited resources and a lack of information regarding post-discharge stroke services in India.

Aim: This study explores the key components and challenges of post-discharge stroke services with clinical staff.

Methods: Semi-structured interviews were undertaken with a purposive sample of health professionals representing the multidisciplinary stroke teams from All India Institute of Medical Sciences (AIIMS), New Delhi, between July and August 2021. As an apex tertiary care center and research institute, AIIMS provides state-of-art care for investigative, operative, rehabilitative and vocational needs of the patients and serves diverse socioeconomic strata of the patient population that includes urban and rural communities from across India. The interviews were conducted, translated and transcribed by a Research Associate. Using NVivo software, data was analysed thematically, using an inductive approach.

Results: Ten healthcare professionals participated: 6 Nurses, 2 Neurologists, 1 Physiotherapist, 1 Consultant (Research). We identified four themes: Integrated Inpatient Discharge Care Planning; Patient and Caregiver Engagement; Post-discharge Care and Support; and Resources and Workforce.

Conclusion: The multidisciplinary team empowers patients and caregivers by providing tailored and targeted education, training and support. The existing post-discharge management system could be formally documented at AIIMS to facilitate a more consistent and comprehensive approach.

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Others

Clinical Staff Perspective of Post-discharge Stroke Care in South India

Veena B, Sylaja PN, Injety RJ, Jones SP

Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, Kerala, India

Background: Stroke is the fourth leading cause of death and fifth leading cause of disability in India. Often, Stroke survivors experience a range of disabilities and are cared for by their families long-term. Stroke rehabilitation along with secondary prevention reduces mortality, improves outcomes, and is an important factor in post-discharge stroke care. However, there are very limited resources and a lack of information regarding post-discharge stroke services in India.

Aim: This study explores the key components and challenges of post-discharge stroke services with clinical staff.

Methods: Semi-structured interviews were undertaken with a purposive sample of health professionals representing the multidisciplinary stroke teams from Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, Kerala, between July and August 2021. As a public hospital, SCTIMST serves a diverse patient population. The interviews were conducted, translated and transcribed by the research team. Using NVivo software, data was analysed by members of the project team thematically, using an inductive approach.

Results: Ten healthcare professionals participated: 2 neurologists, 3 staff nurses, 2 physiotherapists, 2 speech therapists and 1 medico-social worker. We identified four themes: Integrated Inpatient Discharge Care Planning; Patient and Caregiver Engagement; Post-discharge Care and Support; and Resources and workforce.

Conclusion: Staff recognize the importance of involving caregivers in discharge planning and post-discharge care, and indicate that additional time is needed to prepare patients/caregivers for post-discharge.

Others

Organisational Survey for Acute Stroke Care in Vietnam: A Regional Collaboration Programme in Australia, Vietnam, India, and England (RAVIE)

Phan HT, Nguyen HT, Cadilhac DA

Cerebrovascular Department, the 115 People's Hospital, Ho Chi Minh City, Vietnam

Background: Low-middle income countries (LMICs), such as Vietnam have a greater burden from stroke than high-income countries. Few health professionals have stroke specialist training, and care quality varies.
Aim: To support improvements to stroke care, we aimed to gain a better understanding of the resources available for acute stroke care in Vietnam.

Methods: We adapted survey questions from the Australian Organisational Survey of Stroke Services (Stroke Foundation) for use with hospitals in Vietnam. The organisational survey included 65 questions covering hospital services including: use of clinical protocols and assessments; team structure and coordination; communication and roles. The survey was distributed electronically or via paper form to clinical leaders of 91 hospitals treating stroke from Nov – Dec 2020. Data were summarised descriptively.

Results: Sixty-six (73%) hospitals responded; and was mostly completed by doctors (98%) working in Stroke unit/centre (30%), Neurology Department/ward (24%), or Emergency Departments (20%). Approximately 70% of hospitals had a stroke unit with a median of 630 (IQR: 250-1200) acute strokes admitted/year. Most used a clinical care pathway or assessment protocols for managing acute stroke (70%-90%), while 50% had a standardised process for rehabilitation assessments. Sixty-five percent reported access to ongoing stroke management education.

Conclusion: This is the first large-scale cross-sectional, national view of stroke services in Vietnam. The next phase of this project involves a clinical audit of stroke care to confirmed aspects of the self-reported data from these hospitals. The project outcomes will inform whether tailored education or quality improvement programs could improve stroke care quality in Vietnam.

Others

A Study of Gait and Balance in Patients with Age Related White Matter Changes in MRI.

Muthuraju S, Saravanan S

Tirunelveli Medical College, Tirunelveli, India

Background: Gait disorders in the elderly can influence the functional independence. Cerebral small vessel disease (white matter lesions and lacunar infarcts) correlates with gait parameters: stride length and a lower gait velocity.

Even though gait and balance problems are second most common problem after cognitive impairment in Age Related White Matter Changes(ARWMC), but rarely been a target outcome variable in large studies examining the consequences of leukoaraiosis.

Aim:

1. To analyze the strength of association of gait and balance disturbances with the degree of ARWMC.
2. To quantify gait and balance by performing the Short Physical Performance Battery (SPPB), single leg stance time, and walking speed.

Methods: In this observational, cross sectional study conducted on 100 nondisabled individuals. Subjects were graded according to white matter change in the brain based on Fazekas scale. Quantitative tests of Gait and Balance include the SPPB; range: 0 [poor] to 12 [normal], Gait velocity measured by timed 8-m walk, and single leg stance time was measured.

Results: The deficits in gait and balance performance were correlated with the severity of white matter changes on Brain (SPPB: 10.9±2.1 in mild, 9.0±1.8 in moderate, 7.9±2.6 in severe group; $p < 0.05$). Walking speed correlated with the severity of white matter changes (1.32±0.28 m/sec in mild,1.16±0.22 m/sec in moderate, and 1.05±0.31 m/second in severe group; $p<0.05$). single leg stance time also correlated with severity of white matter changes ($p<0.05$).

Conclusion: Our study found strong association between the severity of ARWMC and the severity of Gait and Balance compromise.

Case Reports

Cerebral Venous Sinus Thrombosis and COVID-19 Infection in Myanmar

Naing Ko S, Ohnmar S, Nwe Nwe W, Myanmar

Background: Cerebrovascular disease is the leading causes of death in Myanmar. Currently, third wave of Covid 19 had significant impact in Myanmar. Total number of confirmed cases were about 0.5 million and nearly twenty thousand deaths until second week of October 2021. We present Covid 19 infective patient with extensive cerebral venous sinus thrombosis in Myanmar.

Case report: Previously healthy, 47-year-old man presented with headache and vomiting for three days and seizure attack for one time. He has no history of fever or respiratory symptoms. Clinically he has well conscious and no focal neurological deficit. There was bilateral papilledema on fundoscopic examination. The CECT/MRI/MRV(Brain) showed extensive venous sinus thrombosis (right internal jugular vein, right sigmoid, transverse and superior saggital sinuses). He has mild elevated liver enzyme, D-Dimer (512 ng/ml) with normal complete picture, fibrinogen, LDH, ferritin and renal function. The HCV, HBV, HIV and VDRL revealed nonreactive and cancer screening were also normal. His protein C/S and antithrombin III were normal and negative antiphospholipid Ab. PCR and RDT nasopharyngeal swabs for SARS-COV-2 were positive. He was treated with enoxaparin 60 mg twice daily for two weeks followed by Rivaroxaban 20mg once daily. Currently he has asymptomatic with no papilledema and he has 3rd month of Rivaroxaban. We are planning to continue anticoagulant for 6 months.

Conclusion: Although stroke is common cerebrovascular complication in COVID-19, cerebral venous sinus thrombosis in such patients reported few cases. The unusual site of venous thrombosis such as cerebral venous sinus thrombosis is important clinical suspicious for COVID-19

Case Reports

Case Series: 2 Post COVID Young Stroke (12 and 16 years)

Kalyani J P, Saravanan S, Rachel P, Narayanan S, Ravi P S

Tirunelveli, India

Background: In this covid pandemic era we come across many post covid cerebrovascular accidents. Strokes are not especially common in the young, but when they occur clinical features and evaluation strategies are different. Causes of stroke in the young are more heterogenous and the list includes many genetic, congenital, metabolic and systemic disorders. Here we are presenting two such childhood strokes.

Case Report: 12 year old female child presented with fever for one day and recurrent episodes of seizures followed by acute onset of giddiness, vomiting, unsteadiness clumsiness and restlessness. She was evaluated and treated. Basic investigations were normal. Metabolic screening was normal. Coagulation profile was normal. Cardiac evaluation was done and Echocardiogram was normal, carotid vertebral doppler was normal. Initial CT brain was normal. MRI done later revealed lacunar infarct in right cerebellar hemisphere involving right PICA territory.

Case Report 2: 16 year old boy with no comorbidities presented with weakness of right upper limb and deviation of angle of mouth and slurring of speech on 15/9/2021.GCS –E4/V5/M6 and TEE showed normal sized cardiac chambers with normal systolic and diastolic function without any clot or vegetations. ANA Profile negative. Lipid profile was normal. MRI revealed Acute infarct in the left side of lower pons. He was treated with antiplatelets, statins, neuroprotectives, IV fluids, physiotherapy and supportive care.

Conclusion: More often than in adults the cause of childhood stroke remains obscure, even after thorough evaluation. This was the basic inspiration for me to present these two cases in this elite forum.

Case Reports

A Case Series of Covid-19 Related Stroke Incidence

Riani RAHP, Hapsari MYA, Imanuddin I

Universitas Sebelas Maret, Surakarta, Indonesia

Background: COVID-19 can cause systemic symptoms and respiratory symptoms. Acute respiratory distress syndrome (ARDS), anemia, acute heart injury, secondary infection, and stroke are the complications of COVID-19. Age, oxidative stress, endothelial dysfunction, inflammatory status, vascular risk factors, and hypoxemia are the relative roles of stroke-related to COVID-19. This case report aims to discuss the incidence of stroke-related to COVID-19.

Case report: We report three selected cases of COVID-19 with stroke in two men aged 46 and 70 years and one woman aged 54 years.

Case 1; a 46-year-old man with weakness in the right limbs. With a history of obstructive stroke two years ago. He tested positive COVID-19, and The CT scan indicated a stroke.

Case 2; a 70-year-old man with weakness in the left limb with a history of his head hit the bathroom floor three days before being hospitalized. He tested positive COVID-19. Chest x-ray revealed Bronchopneumonia, and CT scan showed hemorrhagic stroke.

Case 3; A 54-year-old woman with decreased consciousness one day before admission to the hospital. She tested positive COVID-19. Chest x-ray showed Bronchopneumonia, and CT scan showed cystic lesions.

Conclusion: COVID-19 patients with stroke have a risk of bleeding, so we need to be careful in their handling, especially in administering anticoagulants such as heparin. The limitation of the isolation room to perform CT Scans on COVID-19 patients with stroke and not all hospitals have access to CT Scans is a challenge.

Case Reports

Vitt a ‘Hit’ with the ‘Shield’

Sarath H, Syamlal S, Virupaxappa B, Satish B, Hari T A

KIMS HEALTH, Thiruvananthapuram, India

Background: Vaccine induced immune thrombocytopenia and thrombosis is a relatively new entity emerged as a rare but devastating complication of the ChAdOx1 nCoV-19 adenovirus vector vaccine against SARS COV-2. This particular condition having high mortality rates, affects relatively healthy young vaccine recipients. VITT shares the pathogenic mechanism with Heparin induced thrombocytopenia(HIT) with the production of anti-PF4 antibodies in heparin naive. This condition is associated with extensive thrombosis involving both arterial and venous system and the most common thrombotic site at presentation being the cerebral veins.

Case report: This is a survival story of a young lady of 22 year old who presented with acute onset of headache, vomiting of 3 days duration 2 weeks after receiving her first shot of COVISHIELD vaccine.

She had extensive thrombosis involving the cerebral venous sinuses with subdural haemorrhage. She had significant thrombocytopenia and elevated D-Dimer values and was tested positive for anti-PF4 antibodies satisfying the criteria for diagnosing VITT. She has received IVIG followed by early plasmapheresis and non heparinoid anticoagulation at our centre arresting the rapid progression.

Conclusion: VITT is a rare and devastating condition with high mortality occurring in recipients of ChAdOx1 nCoV-19 adenovirus vector vaccine against SARS COV-2. Early recognition and timely intervention with IVIG and/ plasmapheresis is the cornerstone of the treatment. Early institution of plasmapheresis and judicious use of non heparinoid anticoagulants can save the patient.

Case reports

Late Onset Dysphagia – An Unusual Post Stroke Complication

Singireddy M, Shaik V

Deccan College Of Medical Sciences, Hyderabad, India

Background: Dysphagia is a common accompaniment seen in 50% of patients with acute stroke which usually recovers within a week of ictus. Persistent dysphagia (beyond 6 months) has been reported in 11-13% of patients. However late onset dysphagia after a quiscent period following stroke have seldom been reported in literature. In the present case series we report palatal tremor as an unusual etiology for late onset dysphagia.

Aim: In this case series, we describe the clinical profile and imaging characteristics of patients who presented with late onset dysphagia with palatal tremor.

Methods: It is a single center descriptive study of patients who presented with late onset dysphagia with palatal tremor following stroke. Dysphagia was assessed

Results: Three patients were included (two male and one female) with a mean age of 64 years at presentation. All the patients presented with insidious onset and non-progressive dysphagia. All the patients had symptomatic palatal tremor. Facio-oculo-palatal tremor was observed in one patients (66%), unilateral palatopharyngeal tremor in one patient (33%). Most common etiology identified was vascular insult(100%) .The imaging characteristic of Hypertrophic Olivary degeneration was seen in 2 patients. Involvement of the Guillain Mollaret Triangle was uniformly observed in all the patients imaged.

Conclusion: Palatal tremor can be a great masquerader. Hence, a strong clinical suspicion is required and a detailed examination of palate should be a mandate in patients presenting with dysphagia. Thus, palatal tremor could be an answer to at least a few of the various enigmatic etiologies of neurogenic propulsive oropharyngeal dysphagia following a posterior circulation stroke.

Case Reports

Bilateral Cortical and Watershed Infarction Secondary to Unilateral ICA Stenosis

Gupta D, Sharma K, Jain N, Parthasarthy R, Gupta V

Artemis hospitals, Gurgaon, India

Background: Watershed infarcts involve the junction of the distal fields of 2 non-anastomosing arterial territories. Watershed infarctions may involve the more common cortical watershed zones (between the territories of anterior, middle and posterior cerebral arteries) or the less common internal watershed zones (white matter near the lateral ventricle).

Case report: 76-year-old diabetic man presented with sudden onset right hemiparesis for 5 days duration. The patient was hemodynamically preserved with sinus rhythm and blood pressure of 110/76 mmHg. He was found to have weakness of right arm and leg (MMRC grade 4-/5) and left leg (4+/5). Magnetic resonance imaging revealed acute infarcts in the left cerebral ACA-MCA watershed territory (rosary-like pattern) and right ACA cortical territory. Angiography revealed hypoplastic right A1-ACA with bilateral A2-ACA originating from left A1-ACA; with significant stenosis of the left ICA origin. Blood investigations revealed acute kidney injury with serum creatinine of 1.8 mg/dL. The patient was treated conservatively with anti-platelets and statins. He was further advised to undergo cerebral angiography and plan for carotid artery stenting once the renal parameters stabilized.

Conclusion: The cause of bilateral infarcts in our patient is related to the angiographic variation of bi-hemispheric ACA. Both ACA were supplied by left A1-ACA. Hence, left ICA stenosis was the reason for left cerebral watershed infarctions, along with right ACA cortical involvement. Identification of this variant is important for planning further treatment as symptomatic ICA stenosis would require revascularization therapy.

Case Reports

Bow Hunter’s Syndrome Due to Kimmerle Anomaly Diagnosed with Provocative DSA

Subir A, Ghafoor F, Krishnadas N C, Rafeeque M

MES Medical College, Perinthalmanna, Kerala, India

Background: Rotational occlusion of the vertebral artery also known as Bow hunter's syndrome(BHS) is a rare cause for transient vertebrobasilar insufficiency symptoms. The most
common site of dynamic compression being at V2 and V3 segment of vertebral artery(VA). We diagnosed this case of BHS with provocative digital subtraction angiography (DSA) caused by calcified free edge of posterior atlanto-occipital membrane otherwise termed as the Kimmerle anomaly which has not been reported prior to our knowledge.

Case report: To report a rare case of a fifty one year old driver who presented with transient giddiness only on reversing his car with rightward head rotation diagnosed with provocative digital subtraction angiography(DSA) with images for the same. Clinical history and unique advanced imaging findings are reported. Provocative DSA revealed dynamic stenosis of left vertebral artery at C one vertebral level. CT angiogram revealed ponticulus posticus or Kimmerle anomaly occurring due to calcification of the posterior atlanto-occipital(PAO) membrane and treatments with surgical correction was advised. A high index of clinical suspicion helps in prompt diagnosis of BHS in patients with transient vertebrobasilar insufficiency.

Conclusion: This case highlights the importance of provocative DSA in making the definitive diagnosis of BHS and also reports its causal association with calcified PAO membrane or Kimmerle anomaly.

Case Reports

MR Imaging in Moyamoya Disease in Eight-Year-Old Child: A Case Report

Chaudhary N, Randhi V

T N C Medical Foundation, Watangal, Telangana, India

Background: Moya-moya is a rare disorder of paediatric stroke in children involving intracranial vasculature. Its incidence is 0.35 to 0.94 per 1,00,000 population, first reported from Japan. It is a progressive cerebrovascular occlusive disease of the bilateral internal carotid arteries that leads to a compensatory abnormal vascular network at the base of the brain.

Case report: Eight year old female child presented with recurrent TIAs, Epilepsy, Choreiform movement disorder subnormal intelligence since one year. Routine blood investigations were normal. EEG was abnormal with multifocal to generalised epileptiform activity. MRI brain and MR Angiography was done. Anti-epileptic drugs in suitable dose is given to control seizure. Tablet aspirin was started and surgical option was explain to the relatives. MR scan of brain Patchy T2/FLAIR hyperintensity with partial suppression on FLAIR noted in right frontal temporoparietal lobe with mild volume loss of adjacent brain parenchyma - s/o Chronic infarct with gliosis. T2/FLAIR hyperintensities in left frontal lobe, left insular cortex, left corona radiata, centrum semiovale, bilateral capsuloganglionic region, right thalamus S/o Infarcts. FLAIR hyperintensity in sulcal spaces of left cerebral hemisphere - possibly prominent meningeal vessels, Focal narrowing in P1 segment of bilateral PCA, Contour irregularity with diffuse narrowing of left supraclinoid ICA, Focal narrowing in M1 segment of right MCA with contour irregularity of distal segment, cut off of left MCA distal to origin with paucity of distal cortical branches, diffusely narrowed A 1 segment of left ACA with near total occlusion of distal segment,

Conclusion: Above features are suggestive of MOYAMOYA disease. The conventional angiography was not done.

Case Reports

Atypical Presentation of Stroke

Naveen P, Chennappan C

Dhanalakshmi Srinivasan Medical College Hospital, Perambalur, India

Background: Ischaemic stroke is a treatable medical emergency. In an era of time-dependent reperfusion techniques, it is crucial that an accurate and prompt diagnosis is made. Approximately 30% of patients admitted to hyperacute stroke units are subsequently found not to have a final diagnosis of acute stroke although some of these patients do have incidental or previously symptomatic cerebrovascular disease. These patients do not benefit from thrombolysis and may require the input of other specialists or treatments. Meanwhile, a proportion of patients with acute stroke have unusual presentations and are sometimes initially admitted to medical units prior to accessing stroke unit care. It is important that atypical presentations of stroke are recognised so that patients are not denied the benefits of stroke unit care and secondary prevention.

Care Report: Here we observed a 8 case reports of patients admitted in general medicine for some other reason thy found to have stroke. In all the cases presented they all admitted for different medical conditions. Many are not immediately recognised. Diagnostic accuracy has been increased by improvement in imaging techniques.

Conclusion: Precise identification of stroke at the time of presentation can be difficult. The full work up of all patients that may have a stroke probably not feasible and hence initial clinical evaluation still important screening tool.

Case Reports

Takayasu Arteritis with Sjogren Syndrome Presenting as Recurrent Stroke in a Young Adult

Chakraborty R

King George Medical College, Lucknow, India

Background: Stroke is a common cause of morbidity and mortality worldwide affecting usually elderly population. Vasculitis is an important cause of recurrent ischaemic stroke in young. The association of Sjogen's syndrome with Takayasu arteritis is very rare.

Case Report: I highlight the diverse devastating presentation of the disease combination in a young adult male.

A 31 year old male, married, vegan, non-smoker, non-alcoholic presented with sudden onset painless dimness of vision of right eye, giddiness and multiple episodes of loss of consciousness for 7 days. There is history of similar history in left eye 5 months back and also history of sudden onset weakness of left side of body 8 months back which recurred 3 months back. His examination revealed central retinal artery occlusion .and left sided dense hemiplegia with feeble pulses in both the upper limbs. He was thoroughly investigated and diagnosed as Takayasu arteritis with Sjogren syndrome and treated with pulse methyl prednisolone followed by pulse dosing of cyclophosphamide with oral steroid therapy along with antiplatelet and statin therapy.

Conclusion: Recurrent ischaemic stroke needs a mandatory diagnostic workup. Vasculitis is an important entity for stroke in young. Sjogren syndrome, in association with Takayasu arteritis can lead to debilitating state in the form of blindness and dense hemiplegia

Case Reports

Hypereosinophilic Syndrome Presenting as Stroke in Elderly; A Rare Cause

Chakraborty R

King George Medical College, Lucknow, India

Background: Stroke is the leading cause of neurological disability and mortality worldwide affecting more of the elderly population. Hypertension and Diabetes are the deadly duo globally responsible for most of the cases of Stroke and acute coronary syndromes.

Case Report: I present Hypereosinophilic syndrome, a rare entity in itself, detected after its first presentation at the age of 60 years in the form of acute ischaemic stroke. This 60 year old non-hypertensive, non-diabetic lady without any addiction history presented with sudden onset weakness of left side of body for 2 days along with chest pain. Her examination revealed a normal pulse, blood pressure, with neurological examination showing a GCS of E4V5M6 with left sided hypertonia, power of 2/5 in left side, rest of examination being non-remarkable. Her workup revealed a characteristic hypereosinophilic leukocytosis, watershed zone infarcts in right side of brain along with NSTEMI. Her genetic tests were negative for leukemia and she was treated on hydroxyurea, dual antiplatelets and statins.

Conclusion: Hypereosinophic syndrome is a rare disorder in itself and its presentation so late is usually uncommon. The element of hyperviscocity involved meets the Virchow's triad for the pathogenesis of thrombus formation that might lead to stroke and myocardial infarction in this case

Case Reports

Artery Of Percheron Stroke

Damodaran A, Koutaich R, Nayak D, Ibrahim M

Kuwaiti Hospital, Sharjah, United Arab Emirates

Background: Artery of Percheron (AOP) is an anatomical variant in posterior circulation wherein a single perforating artery arises from P1 segment of posterior cerebral artery and supplies bilateral thalamus with or without mid brain. Occlusion of this artery results in variable presentation like altered mental status, decreased level of consciousness and memory impairment.

Case Report: Here we present two cases of AOP infarct with different presentation and the diagnosis was missed at the time of presentation. Our first case was covid pneumonia presented with altered sensorium and diagnosed to have AOP infarct. Our second case presented due to excessive lethargy and hypersomnolence. Time of onset was not clear in our first case. Second case even though presented during thrombolytic window –she was not thrombolysed because of atypical presentation and initial imaging was normal.

Conclusion: Given the variable presentation of AOP infarct and also lack of evidence of stroke in initial imaging many patients miss the potential time window for tissue plasminogen activator administration. It is also difficult to assess the time of onset of stroke in this varied presentation. These cases also highlight the importance of detailed evaluation in patients atypical neurological presentation to avoid delay in treatment and to improve clinical outcomes.

Case Reports

Interesting Case of Cortical Blindness

Naveen P, Chennappan C, Namrata AD

Dhanalakshmi Srinivasan Medical College Hospital, Perambalur, India

Background: Bilateral cortical blindness refers to the total loss of vision in the presence of normal pupillary reflexes and un the absence of ophthalmological disease resulting from bilateral lesions of the striate cortex. **Case Report:** We report the case of an 65-year-old man with cortical blindness resulting from bilateral occipital infarcts. The patent presented this infrequent clinical condition after acute bilateral infarction of the occipital lobes possibly due to cardiac embolism resulting from atrial fibrillation of unknown duration. Interestingly, the visual symptoms were complicated neither by anosognosia not by memory impairment. **Conclusion:** Cerebrovascular disease could be the background in a bilateral cortical blindness, as in our patient. To our knowledge, this is the first reported case with bilateral cortical blindness due to bilateral occipital infarct

Case Reports

Non Compaction Cardiomyopathy: A Rare Cause of Stroke

Mishra A, Kalita J, Kapoor A

Sanjay Gandhi Post Graduate Institute of Medical Science, Lucknow, India

Background: Stroke in young patients differs from the stroke in elderly because of diverse etiologies, nature of stroke and therapeutic approach.

Case report: We report a case of young male in early 20s presenting with cough and progressive exertional dyspnea for 20 days. Echocardiography revealed severe left ventricular dysfunction. Cardiac MRI revealed left ventricular dilatation with global hypokinesia and non-compaction of left ventricle with non-compacted (NC) to compacted (C) myocardium diameter ratio > 2.3 in end-diastole. He suffered from an ischemic stroke with left hemiplegia and hemianopia on day 4 of hospital stay with NIHSS score of 11. He underwent thrombolysis with intravenous Tenecteplase and became functionally independent on day 15th. There was no recurrent stroke or TIA during 4 months follow up with anticoagulant and decongestive therapy. His cardiac condition was stable and did not have any neurological deficit. His brother and parents were healthy and their electrocardiogram and echo were normal

Conclusion: In a young stroke left ventricular noncompaction cardiomyopathy should be looked for during echocardiography. LVNC is a rare but important cause of stroke in young. Diagnosis and treatment of the patient should be combined with the cardiac screening of the first-degree relatives.

Case Reports

Idiopathic Internal Jugular Vein (IJV) Thrombosis: A Case Report & Review of Literature

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Background: Internal jugular vein (IJV) thrombosis is an extremely rare vascular disease, with high mortality and varied aetiology.

Case report: A 63 year old female, k/c/o Type 2 diabetes mellitus, presented with two episodes of giddiness and vomiting without loss of consciousness or fall, followed by headache that was throbbing, holocranial, moderately severe to hamper sleep, radiating to the neck with increase on neck movements. A week later, she developed partial drooping of the right upper eyelid with occasional blurring of vision and diplopia. There was no deviation of the eyes or head tilt or h/s/o restriction of eye movements. She was afebrile with normal pulse and blood pressure, no lymphadenopathy or cervical mass/tenderness. Neck movements were painful, aggravated by neck flexion. Neurological examination revealed incomplete ptosis of right eyelid without fatigueability, normal pupils, extra-ocular movements and fundi Rest of the examination was unremarkable. Routine blood tests including hemogram and biochemistry were normal. X Ray cervical spine: straightening and degenerative changes, RNST: no decrement, MRI Brain and CSF: unremarkable. CT Angiography brain and neck vessels showed filling defect in Right IJV s/o thrombosis producing 30-35% occlusion. Her history was negative for any risk factors as was screening for malignancy and hyper coagulable state. She improved with subcutaneous heparin and oral anti coagulant therapy.

Conclusion: This is a case of unprovoked IJV thrombosis without obvious risk factor. IJV thrombosis is rare site for venous thrombosis with wide spectrum of presentations. It could be provoked or unprovoked, secondary to hypercoagulable states or idiopathic.

Case Reports

Case Series of Paediatric Stroke in Tertiary Care

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Background: The incidence of pediatric stroke ranges from0.54 to 1.3 per 1,00,000 children.

Aim: The main objective of this presentation is to study the diverse etiology in pediatric stroke.

Case reports: Case 1: Early term (37 weeks + 2 days) born to a GDM mother delivered through LSCS. Baby developed seizures involving left upper limb and lower limb on day 2. MRI showed infarct in the right MCA territory. The thrombotic profile was negative and the features where in favor of placenta embolic event due to GDM.

Case 2: 12 yr old boy presented with complaints of unsteadiness with slurring of speech and weakness of left upper and lower limb. MRI imaging showed bilateral cerebellar, right Hemi pons infarct. The patient was worked up for young stroke with investigation supportive of Protein S deficiency.

Case 3: 14 yrs old female a known case of G6PD deficiency disease presented with complaints of diplopia which was acute in onset. O/E up gaze restriction with lid retraction and convergence nystagmus was noted. MRI Brain revealed infarct in dorsal midbrain.

Case 4: 18 yr old female presented within 2 Hrs of onset of weakness of left upper limb and lower limb with deviation of angle of mouth to right side. MRI showed infarct in right fronto- parietal region. The patient was worked up for young stroke.

Conclusion: More than half of pediatric stroke has an underlying etiology which proves to be a diagnostic challenge.

Case Reports

A Rare Case of Right Caudate Nucleus Infarct Leading to Ipsilateral Hemichorea - Hemiballismus

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Background: Hemichorea Hemiballismus usually results from the involvement if contralateral subthalamic nucleus and caudate nucleus. It is a spectrum of involuntary, continuous, nonpatterned movement involving one side of the body. But ipsilateral hemichorea hemiballismus is a rare entity to the extent that only a few cases have been reported in the literature. The pathophysiology is unknown, although several explanations have been proposed. Here we describe a case of hemiballismus-hemichorea resulting from an acute infarct in the right caudate nucleus and putamen.

Case report: Our patient, a 26 year old male presented with sudden onset abnormal movements of the right side of the body in the form of choreoballism. The examination revealed presence of long tract signs on the left side without any sensory loss. MRI Brain was done which showed an acute infarct on the right side involving the caudate and putamen.

Conclusion: Ipsilateral Hemichorea- hemiballismus is a rare entity. Only 4 cases have been reported in literature and only one case with right sided lesion presenting as right Hemichorea- hemiballismus. The possible options for treatment include Neuroleptics, Benzodiazepines and DBS in refractory cases. Newer modalities like functional imaging and diffusion tensor imaging might offer insight into the pathogenesis.

Case Reports

Cerebral Sinus Venous Thrombosis with Seizure as the Initial Clinical Manifestation

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Background: Cerebral Sinus Venous Thrombosis (CSVT) is a type of stroke where the thrombosis occurs in the venous side of the brain circulation, that leading to occlusion of one or more cerebral veins and dural venous sinus. CSVT represents 0,5-1% of all strokes and is a part of a neurological emergency that might misdiagnose at the beginning of a presentation. It's because the symptoms and clinical course of CSVT are highly variable, etiological factors are even more heterogeneous making CSVT a unique clinical entity.

Case report: We report a case of a 26 years old woman diagnosed with CSVT presenting with loss of consciousness after seizure 3 hours before admission. She improved with anticoagulation medication. After investigation of what possibly happened to this patient, we predict that malformation of the left transverse sinus might contribute the thrombus formation.

Conclusion: Our report highlights the value of early recognition of CSVT with neuroimaging is the most important to treat the patient for a better outcome.

Case Reports

Stroke in Systemic Disease - A Diagnostic Enigma

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Background: Antiphospholipid antibody syndrome (APLS) is hypercoagulable autoimmune disorder characterized by pregnancy morbidity or recurrent arterial/venous thromboembolism. We describe a middle aged women with wide spectrum of clinical manifestations. Detailed evaluation concluded that all manifestations were epi-phenomena of sole clinical entity.

Case report: 55 year female known hypertensive, diabetic, hypothyroid presented with left sided hemiparesis(4/5),left UMN Facial palsy and Brocas aphasia. MRI revealed acute right frontoparietotemporal infarct. Antiplatelets and neuroprotective agents initiated. Carotid doppler was normal. Echo revealed concentric LVH with anterior mitral leaflet vegetation's. Infective endocarditis workup negative. Blood investigations revealed anemia, elevated LDH and ferritin levels with normal iron, B12 and Folic acid. Peripheral smear showed normocytic normochromic anemia with spherocytes. Hemolytic anemia workup was negative. Hb Electrophoresis revealed borderline beta Thalassemia trait. USG abdomen showed cholelithiasis with hepatosplenomegaly. Lupus Anticoagulant by DRVVT and Cardiolipin antibodies were positive. Steroids and hydroxychloroquine initiated. Considering prior history of recurrent spontaneous ulcerations of foot, limb venous and arterial doppler were done and normal. Heparin was started in view of nonbacterial thrombotic endocarditis. However patient developed thrombocytopenia and blood in stools, heparin induced thrombocytopenia was suspected and started on Injection Fondaparinox. Patient improved with no new thrombotic or neurological event.

Conclusion: APLS in association with cerebral ischemia originating in the carotid arteries is less common. It has been observed that when brain infarctions occur, they are usually associated with anticardiolipin antibody and its presence can be independent risk factor for stroke.

Case Reports

Intracranial Hypertension Without CVST in Apla Syndrome: An Unique Association

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Background: Antiphospholipid antibody (APLA) syndrome is an autoimmune disorder predisposing to thrombotic complications in which CNS is commonly affected either by arterial vaso-oclusion or venous thrombosis. Cerebral venous sinus thrombosis (CVST) secondarily cause raised intracranial pressure (ICP). However intracranial hypertension without evidence of CVST is rare and few reports exist regarding this entity. Here we present a case of elevated ICP with absence of identifiable CVST.

Case report: A 28 year old female had a 2 months history of progressive holocranial headache followed by painless vision loss in both eyes reaching peak deficit over 20 days. Light perception was absent in right eye with left eye relatively better preserved. CSF opening pressure was elevated. Fundoscopy revealed bilateral papilloedema with peridiscal splinter haemorrhages and vessel tortuosity. MRI showed partially empty sella with bilateral optic nerve tortuosity. The diagnosis of Idiopathic intracranial hypertension (IIH) was made and patient was advised acetazolamide medication. There was complete resolution of the clinical and radiological abnormalities. 5 months later she presented with acute onset right sided hemiparesis. This time MRI revealed left MCA territory infarct with patchy focal DWI restriction. MR venogram was normal. She was then identified to be APLA positive with high titres of Anti cardiolipin and Beta 2 glycoprotein both IgG and IgM.

Conclusion: This is a non thrombotic complication of APLA syndrome and requires further large scale study for insight into the pathogenesis and early recognition to avoid future complications.

Case Reports

Non Compaction Cardiomyopathy with Cardioembolic Stroke

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Background: Cardioembolism is responsible for 20% of all ischemic strokes.
Cardiac sources of stroke with higher risk of recurrent embolism are prosthetic valve, atrial fibrillation, cardiomyopathy, ventricular aneurysm, ventricular hypokinesia. Left ventricular non compaction is a genetic cardiomyopathy characterized by prominent ventricular trabeculations and deep intertrabecular recesses communicating with the left ventricular cavity, causing heart failure, arrhythmia and stroke.

Case report: 40 year male who is an alcoholic, smoker developed sudden onset weakness of right upper and lower limb with slurring of speech 3 days before admission to our hospital. On the same day evening weakness improved and he was able to lift his upper and lower limb. There was a Family history of sudden cardiac death of father at age of 45. Motor Aphasia present. Right UMN facial palsy with Right hemiparesis with grip weakness and Babinski sign. ECG: Left atrial enlargement, poor R wave progression from V1 to V4leads.

CT Brain: Left MCA territory infarct ECHO: Non compaction Left ventricle, severe LV Systolic dysfunction CARDIAC MRI: Prominent apical trabeculations Non compaction/Compaction ratio 3 Treatment: Antiplatelets, statin, heart failure measures Oral anticoagulation with Warfarin & INR monitoring (CHA2DS2 VASc 3) Physiotherapy

Conclusion: Stroke in patients with Left ventricular Non compaction is 1-2% per year. Reduced Ejection fraction & Atrial fibrillation are the highest risk factors for stroke in these patients. Anticoagulation based on risk score and ICD for primary prevention of sudden cardiac death must be considered in them.

Case Reports

Unilateral Internal Cerebral Vein Thrombosis Presenting as Nonconvulsive Status Epilepticus

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Background: Cerebral Venous Sinus thrombosis is a neurological emergency characterised by thrombosis of intracranial venous sinuses and or cerebral veins, which leads to retention of venous drainage, increase in intracranial pressure and venous infarcts. Clinical presentation of CVST ranges from headache and vomiting to focal neurological signs and altered sensorium. Nonconvulsive Status epilepticus (NCSE) as a presenting feature of CSVT is not common. Among the CSVT, unilateral internal cerebral vein thrombosis is extremely rare. Here we are reporting a case of unilateral internal cerebral vein thrombosis presenting as NCSE.

–**Case report**: This is a case of a 22 year old lady presented with headache followed by altered sensorium and drowsiness, brought to hospital. On arrival in emergency department, she was confused, aphasic with right sided hemiparesis and right extensor plantar. MRI Brain with MR Venogram done showed acute infarct in the left corona radiata, left basal ganglia and left thalamus with left internal cerebral vein thrombosis. Her EEG showed NCSE as per modified Salzberg criteria. She was extensively worked up for CVT, thrombophilia work up which came as negative. She was treated as per the status epilepticus protocol along with low molecular weight heparin, antioedema measures and later changed to oral anticoagulants. She became symptomatically better and hence discharged.

Conclusion: NCSE can be the presenting feature of internal cerebral vein thrombosis. NCSE and internal cerebral vein thrombosis are both life threatening conditions. Prognosis of unilateral internal cerebral vein thrombosis is excellent if diagnosed and treated early, but it can be fatal if there is delay in diagnosis and treatment.

Case Reports

A Curious Case of Recurrent Transient Focal Neurological Episodes - An Interesting Case Report

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Background: Cerebral amyloid angiopathy (CAA) commonly presents as spontaneous lobar intracerebral hemorrhage (ICH) or cognitive dysfunction in the elderly. Characteristic clinical presentation of CAA is Transient focal neurological episodes(TFNE), also called amyloid spells seen in 14% of patients. The radiological spectrum of CAA includes white matter hyperintensities, lobar cerebral microbleeds, Cortical Superficial Siderosis(CSS) and Convexity Subarachnoid hemorrhage(cSAH).

Case report: An 81- year old man with history of coronary artery disease(CAD) and left ventricular clot was on antiplatelet and warfarin 5 mg daily. He presented with tingling of the left upper limb associated with stiffening, lasting for 10 minutes and spontaneously resolving. He had similar transient episodes in left leg after an hour. His clinical evaluation at presentation was normal. MRI brain with susceptibility imaging showed convexity hemorrhage, curvilinear blooming in sulcal spaces of right cerebral convexity and left precuneus with associated microbleeds & white matter changes that suggested CAA. EEG was normal and INR was in sub-therapeutic range. Warfarin was stopped and aspirin with atorvastatin was continued for his CAD. He was treated with Valsartan, Spironolactone and Clobazam. He had no further episodes after treatment.

Conclusion: Amyloid spells due to CAA can present like Transient ischemic attacks or focal seizures. Escalation of antithrombotic therapy considering it as TIA can lead to frank ICH in patients with CAA. So, the knowledge about amyloid spells and their radiological signatures is essential especially in elderly. Caution should be exercised in administering antiplatelets to all patients with suspected TIA.

Case Reports

Multimodal Treatment in Large Vessel Occlusion Stroke Due To Aortic Dissection

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Background: Neurological symptoms such as ischemic stroke are present in 18-30% of patients with aortic dissection. These symptoms are due to systemic hypotension or dissection/occlusion of one or more aortic side branches supplying the brain. There are still controversies whether the neurological deficit in aortic dissection leads to a poor outcome or hospital death. Meanwhile, one of the absolute contraindications of intravenous fibrinolytic in acute ischemic stroke management is aortic dissection.

Case report: A 40-year-old male had onset of chest pain due to aortic dissection, followed by severe motor aphasia, right hemiparesis, and became unconscious one month prior to admission. He had history of hypertension and dyslipidemia. After undergoing immediate Bentall procedure and being treated in intensive care unit for a month, he slowly regained consciousness, but neurological deficits persisted. Brain magnetic resonance imaging and angiography test showed subacute infarct at left frontal-parietal-temporal-insula and basal ganglia with severe stenosis at left middle cerebral artery. Whole abdominal CT Scan showed dissected thoracic, abdominal aorta, and left common iliac artery. Multimodal treatment with antithrombotics, neuroprotective agents, and neuromodulation therapies including transcranial magnetic stimulation, transcranial direct current stimulation, and rehabilitation were given to him. After one month, his neurological status greatly improved with the modified Rankin Scale of 2.

Conclusion: Emergency aortic surgery provides the uttermost chance for survival in this case. Clinical considerations before, during, and after surgery are essential to achieve the best outcome. Multimodal treatment with medication and neuromodulation therapy potentially aids in improving functional outcome of the patient.

Case Reports

Therapeutic Effect of Multitarget Cortical Stimulation on Uncontrolled Spells of Pathologic Laughter and Crying (PLC) Associated with Motor and Cognitive Impairments in Stroke Survivors

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Background: PLC is an uncontrolled outburst of laughing or crying without any appropriate environmental trigger. PLC is quite disabling but unrecognized manifestation following stroke creating mental, physical and social burden on patient. This is a rare case report describing therapeutic effect of multitarget cortical stimulation on PLC along with motor and cognitive impairments in a post stroke survivor.

Case report: This Paper describes a case of 66 Year old Female, who was participant of a clinical trial registered with CTRI (CTRI/2020/01/022998). She had history of hypertension and diabetes from past 10 years. 9 months back she experienced an episode of stroke. Within course of time, symptoms of forgetfulness, difficulty in planning, executive functions with additional emotional and personality fluctuations. She had intermittent laughter and crying spells without apparent triggers. Detailed neurological (motor and cognitive) examination was done to elucidate the course of present illness. Outcome Measures: Outcome assessment was done using Fugl-Meyer assessment scale, Wisconsin Gait Scale, Montreal Cognitive Assessment, Stroke Specific quality of life assessment scale, PLC Episodes (Intensity, Frequency, duration) was documented. Intervention Multichannel Transcranial Direct current stimulation over left primary motor cortex i.e. C3 point and left dorsolateral prefrontal cortex i.e. F3 point (1.2 mA intensity, 20 minutes/session) along with Bank of Physical exercises and Cognitive Training (Mnemonics, Retrieval, Method Loci and Chunking).

Conclusion: M-tDCS induced improvement in the motor and cognitive domains. Her episodes of PLC reduced significantly along with improvement in overall quality of life.

Case Reports

Hidden in Plain Sight: Hypereosinophilia - An Elusive Cause of Recurrent Stroke

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Background: Recurrent stroke carries huge burden; as with each stroke, there is accumulation of neurological deficits. Recurrent stroke in absence typical cardiovascular risk factors should be investigated for rare causes. Hypereosinophilic syndrome is known to cause organ dysfunction secondary to tissue infiltration, as well as a systemic hypercoagulable state. Cardio embolism due to endomyocardial fibrosis secondary to major basic proteins secreted from eosinophils can occur in hypereosinophilc syndrome.

Case report: 53 year old gentleman with history of progressive cognitive decline due to recurrent stroke since 3 years; had presented with left ataxic hemiparesis. Extensive workup ruled out the etiologies for recurrent stroke and the only possible causative factor which could be identified was hypereosinophilia with absolute eosinophil count of 2900/cu.mm for more than six months. Work up for secondary hypereosinophilia was negative. After starting steroids; with normalisation of eosinophil count, there was no further recurrence of stroke.

Conclusion: Recurrent strokes are a cause for major concern as with every stroke there is worsening of the neurological status. Most important part of treatment is to find the etiology of recurrent stroke and to prevent recurrence. Hypereosinophilic syndrome is; though not a common entity but if defined early and treated; in case of stroke may prevent future recurrences and disability. For stroke patients without traditional risk factors; vascular risk factors, an appropriate differential count of white blood cells would be indicated in order to detect this rare and potentially treatable disease.

Case Reports

An Unusual Cause of Stroke in an Elderly Female - 3 Territory Sign

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Background: Multiple cerebral territory infarcts of undetermined origin are typically attributed to cardioembolism; and most frequently atrial fibrillation. Three territory sign as a radiographic marker of stroke due to malignancy is under recognized. Here we report a case of common presentation of stroke with uncommon etiology

Case report: 58yr female with no comorbid illness presented with sudden onset of left sided upper limb and lower limb weakness. MRI was s/o right ACA- MCA and MCA- PCA watershed infarct. Patient was investigated in suspicious of cardioembolic stroke where ECG, Holter monitoring and 2Decho were normal and treated with antiplatelets, statins and physiotherapy. After 10 days patient devolped sudden onset weakness of right sided upper limb and lower limb with Aphasia. Repeat MRI Brain s/o left MCA –PCA watershed infarct with frontal and parietal cortical infarct. Patient was investigated and CT Chest s/o Lung carcinoma. HPE s/o Adenocarcinoma and patient was treated with inj heparin, chemotherapy and radiotherapy

Conclusion: This case report reminds us of the importance of not only thorough history taking and clinical examination but also MRI Brain with 3 territory sign will help in early diagnosis and management. Three territory sign is a highly specific marker and 6 times more frequently observed in malignancy-related ischemic stroke than atrial fibrillation-related ischemic stroke. Evaluation for underlying malignancy and its associated hypercoagulable states in patients with Three territory sign is reasonable with undetermined etiology.

Case Reports

A Rare Case of Stroke in Young

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Background: Syphilis isa sexually transmitted disease caused by Treponema pallidum with human being as the only host. Neurosyphilis is defined as any involment of the central nervous system by the bacterium Trephonema Pallidum.

Case report: A 27 year old man who presented with headache, blurring of vision, memory impairment and language disturbance in the form of conductive aphasia. He gave a past history of right hemiparesis of 4 months duration which was not evaluated and treated appropriately. On examination he had subtle pyramidal signs on the right side with right sides facial nerve palsy with left eye disc edema. CT brain showed edema in the left parietal region with hypodense lesion in the left capsuloganglionic region. A provisional diagnosis of young stroke was made, Investigations ruled out cerebral venous thrombosis.

He gives a part history of consumption of alcohol. No risk factor for young stroke could be identified.

There was history of high risk sexual behaviour. Examination revealed healed penile ulcer. Serum VDRL and RPR was strongly positive, HIV was negative. MRI showed laminar necrosis in the left parietal region, possibly due to syphilitic endarteritis. CSF was done which showed elevated counts and CSF VDRL came as Negative. He was treated with Inj. Ceftriaxione for 14 days. On follow up his symptoms were noted to be improving.

Conclusion: So reporting a rare case of syphilis with early meningovascular involvement.

Case Reports

If Nothing Goes Right, It Goes to the Left: A Case of Left Anterior Cerebral Artery Stroke Due to Right Internal Carotid Artery Stenosis

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Background: Symptomatic carotid stenosis causes neurologic symptoms in the ipsilateral anterior circulation territory commonly due to a plaque in the carotid bifurcation and proximal internal carotid artery (ICA). Azygos anterior cerebral artery (AACA) is a variant of Willisian circle anatomy characterised by the absence of anterior communicating artery (ACom) and the bilateral anterior cerebral arteries (ACAs) join to form a single trunk.

Case report: A 55 years old gentleman with history of hypertension and dyslipidemia presented with acute onset right lower limb weakness and speech disturbance outside thrombolytic window. Examination showed apathy, global aphasia, right upper motor neuron facial weakness and right lower limb weakness. CT brain showed evolved infarct in the left ACA territory. CT angiogram showed right ICA hypodense plaque causing about 80% stenosis at origin and azygous ACA with occlusion of the left division of azygos ACA. Cardiac evaluation was normal. He was managed with dual antiplatelets and statin. The left ACA territory infarct could be explained by right ICA stenosis due to the coexistent true azygos ACA with probable embolisation from the right ICA plaque as the mechanism causing the infarct. In view of the symptomatic right carotid stenosis, carotid revascularisation was considered. He underwent right carotid endarterectomy after 1 month.

Conclusion: AACA is a rare variant, which can produce unilateral or bifrontal infarctions. The anatomical variations in the ACA should be carefully looked into in cases of ACA territory strokes and a proper etiological evaluation aid in the optimal management.

Case Reports

Successful Mechanical Thrombectomy in Acute Ischaemic Stroke With Heart Failure

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Background: Intravenous thrombolysis and Mechanical Thrombectomy are the standard of care in acute ischaemic stroke with large vessel occlusion. Heart failure is a disease that is associated with increased morbidity and mortality. In addition, several patients with heart failure have comorbidities like peripheral artery embolism, which add to the mortality. The outcome of mechanical thrombectomy remains uncertain in individuals with heart failure as compared to those with normal left ventricular systolic function.

Case report: A 40-year-old female known case of hypertrophic cardiomyopathy with severe left ventricular dysfunction presented to us with complaints of left hemiparesis, dysarthria and left sided facial palsy. As she presented within the window period for IV thrombolysis, she was thrombolysed with intravenous Alteplase. MRI Brain with angiogram done after thrombolysis revealed cut off of M1 segment of right middle cerebral artery, with no distal flow. In view of large vessel occlusion, she was transferred to the cath lab and a baseline digital subtraction angiography was done, which was followed by mechanical thrombectomy. Post thrombectomy angiogram showed that perfusion was completely re-established. The patient showed significant improvement of her clinical symptoms post mechanical thrombectomy.

Conclusion: Mechanical thrombectomy may be a safe and effective intervention in patients of heart failure, who have acute ischaemic strokes with large vessel occlusion.

Case Reports

Congenital Absence of the Bilateral ICA

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Background: Agenesis of the bilateral intracranial ICA is a very rare congenital anomaly. Unilateral agenesis is comparatively more common and usually diagnosed incidentally when patients present with headache, TIA or intracranial haemorrhage.

Collaterals from the posterior circulation (bilateral agenesis) and from the opposite side (unilateral agenesis) play a large role in maintaining the brain vascularity in these conditions.

Case report: We present a 45 year old gentleman with a history of reduced consciousness and right hemiplegia. MRI revealed large acute infarcts in the left MCA and bilateral ACA territory. Multiple acute lacunar infarcts were also noted in the left cerebellar hemisphere and bilateral frontoparietal and left occipital lobes. However, no reformation of the bilateral anterior cerebral artery was seen. A diagnosis of congenital agenesis of the bilateral ICA was considered and CT brain was done for confirmation which showed absence of the bilateral carotid canals.

Conclusion: This case highlights the rare congenital vascular abnormality and unique vascular distribution and risk of acute cerebro-vascular events in these patients.

Case Reports

A Case of Migrainous Infraction in Young Female

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Background: Migrainous infarction (MI) could be a rare complication of migraine headache that accounts for 0.5–1.5% of all ischemic strokes, predominantly associated with aura. In young migraineurs, the posterior circulation involvement and therefore the presence of patent foramen ovale were characteristic.

Case report: We report a case of 17-years old female patient case of complicated migraine who presented with complaints of left sided hemiparesis with left UMN facial weakness, with mechanical thrombectomy done A full investigation workup using MRI revealed evidence of multiple lacunar infracts with MRA shows right M1 segment occlusion

Conclusion: Our case highlights the necessity to evaluate silent ischaemic stroke in case of prolonged headache with a history of migraine furthermore the need for precaution to avoid the employment of triptans or opioids in such a case. It also highlights the conditions that require to be excluded before labelling it as a complicated migraine.