http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v13i05.10

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

A Study on Risk Factor Prevalence and Clinical Profile among Ischemic and Haemorrhagic Stroke Patients

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Abstract
Introduction: *The burden of stroke is increasing worldwide; stroke is now the fourth leading cause of death and the fifth leading cause of disability amongst all age groups. The incidence and mortality of stroke is higher in Asian countries than Western countries. Crude incidence of stroke ranged from 108 to 172/100,000 people per year, crude prevalence from 26 to 757/100,000 people per year, and one-month case fatality rates from 18% to 42%. Anterior circulation stroke is the commonest type whereas the posterior circulation stroke comprises only 20% of the stroke. Therefore, it is important to determine the clinical profile among stroke patients.*
Aim:
1. To study clinical profile among ischemic and haemorrhagic stroke.
2. To study the risk factor prevalence in ischemic and haemorrhagic stroke in adults.
Methods: *This hospital - based cross sectional study was conducted over six months in the department of General medicine in a tertiary care hospital in Puducherry. After the initial assessment, all the patients were subjected to a general physical examination followed by a laboratory and radiological investigations following which ABPI, NIHSS and mRS were calculated and patients will be assessed for risk factors, clinico-radiological features of stroke.*
Results: *A total of 63 patients were participated in this study. The overall result shows significant differences in clinical profile and risk factors among different types of strokes.*
Conclusion: *This study was helpful in identifying the risk factors, clinico-radiological features among Ischemic, Hemorrhagic, Anterior and posterior circulation stroke.*
Keywords: *Anterior circulatory stroke, Posterior circulatory stroke, Ischemic stroke, Hemorrhagic stroke, NIHSS-National Institutes of Health Stroke Scale, mRS - Modified Rankin Scale, ABPI – Ankle brachial pressure index.*

Introduction

Stroke is a devastating and disabling cerebrovascular disease with significant amount of residual deficit leading on to economic loss. It has been defined as a rapidly developing signs of focal (or global) disturbance of cerebral function with symptoms lasting for ≥24 hours, or leading to death with no apparent cause other than vascular origin. It is a collection of clinical syndromes resulting from cerebral ischemia to intracranial hemorrhage[1].

The burden of stroke is increasing worldwide; stroke is now the fourth leading cause of death and the fifth leading cause of disability amongst

all age groups. The incidence and mortality of stroke is higher in Asian countries than Western countries. Crude incidence of stroke ranged from 108 to 172/100,000 people per year, crude prevalence from 26 to 757/100,000 people per year, and one-month case fatality rates from 18% to 42%. Anterior circulation stroke is the commonest stroke type, whereas about only 20% of the cerebral blood flow is directed to the posterior circulation (PC) and so the posterior circulation stroke comprises only 20% of the stroke. The internal carotids systems and their branches form the anterior circulation of the brain. The majority of both cerebral hemispheres are supplied by both carotids except the medial part of the temporal lobes, and occipital lobes which are supplied by the posterior cerebral arteries[2].

Two vertebral arteries, one basilar artery and two posterior cerebral arteries and their branches form the posterior circulation of brain vascular supply. The area of brain supplied by the posterior circulation includes medial temporal lobe, brainstem, cerebellum, occipital lobes and thalamus. The arterial anatomy and the site of obstruction in PC and AC strokes show notable differences. Current data comparing PC and AC strokes with regards to clinical, etiological, radiological, and outcome factors are scarce and multivariate analyses were not applied or are limited to large PC only case series. There are conflicting data about stroke mechanism in PC as compared to AC strokes. Some publications show more frequent embolism in the PC and others more lacunars. Furthermore, PC strokes may simulate AC strokes clinically in a significant proportion of patients[3].

The stroke has many risk factors. Identifying these risk factors helps in stroke prevention. Risk factors of stroke are categorised into modifiable and non-modifiable. Non-modifiable stroke risk factors include Age >65 years, male gender, race, hereditary causes. Modifiable stroke risk factors include Cigarette smoking, Diabetes mellitus, Hypertension, dyslipidemia, Hypothyroidism, Autoimmune disorders, hyper coagulable states. There are few reports to enumerate the risk factors, clinical features and radiological findings between anterior and posterior circulation stroke. In this study, I study the clinical profile among anterior circulation stroke and posterior circulation stroke concerning their risk factors, Clinical features and radiological findings in adults[4].

Methods

This hospital based cross- sectional study was conducted in the Department of General medicine in a tertiary care centre in Puducherry. This study was conducted six months from January 2024 to June 2024. Sample size for this study is calculated by using the software open EPI version 3 by considering the cross-sectional observational study conducted by Vinoth K et al. Sample size was calculated as 63 at 95% confidence interval and 8 % absolute precision error, by proportion method. The study was conducted on 63 patients who came to General medicine OPD/ Emergency department and those who got admitted in General Medicine department of SMVMCH with adults aged more than 18 years of age who has been diagnosed to have Acute stroke within 3 days of onset.

Inclusion Criteria

Adults aged more than 18 years of age who has been diagnosed to have Acute stroke who present to OPD/Emergency Department within 3 days of onset.

Exclusion Criteria

1. Patient's refusal to participate in the study.
2. Patients CT/MRI reports not showing confirmed diagnosis of stroke.
3. Patients with known haematological malignancies

Data Collection:

Patients screened based on inclusion criteria and exclusion criteria

Strict study protocol was followed. Detailed history was obtained, examination was done, NIHSS and mRS scores were calculated

Patient's routine blood and radiological Investigations were collected and interpreted and correlated for etiological factors, risk factors, clinical-radiological features of stroke.

Statistical Analysis:

Data will be entered in EpiInfo software (version 7.2) and analysed using SPSS software (version28). The categorical data will be expressed in terms of rates and percentages and the continuous data will be expressed in terms of mean + standard deviation. Continuous data will be compared using independent sample t test.

Ethical Approval

Under the reference number EC code no:219/2024, the Internal Human Ethics Committee of the Sri Manakula Vinayagar Medical College in Madagadipet, Kalitheerthalkuppam, Puducherry, India, approved the study protocol.

Results

A total of 63 patients were participated in this study.

Age Distribution among Stroke patients

S.no	Age Group (Category)	N%
1.	25-50	9(14.4)
2.	51-70	40(63.4)
3.	>71	14(22.2)

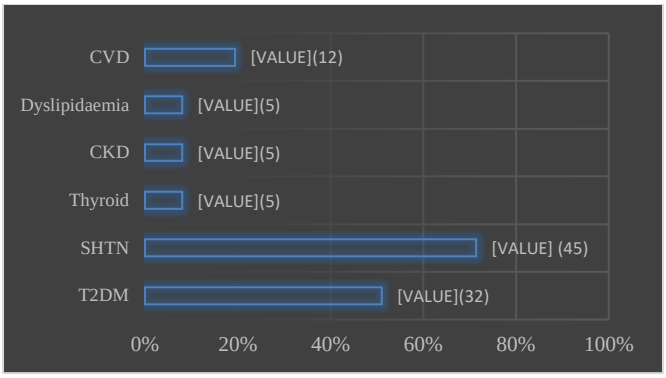
Mean age among the study patients was 62.1 ± 11.6, age distribution about 63.4% of patients fall within the 51-70 years age group, with a smaller proportion in the younger 14.4% and older age 22.2% categories respectively.

Gender distribution among stroke patients

S.no	Gender	N%
1.	Male	43 (68.2 %)
2.	Female	20 (31.8%)

In terms of gender, a larger proportion of participants are male (68.2%) compared to female (31.8%)

Comorbidity patterns among the study patients



T2DM Diabetes mellitus SHTN Systemic hypertension
CKD Chronic Kidney disease CVD Cardiovascular disease

This chart higlights that systemic hypertension (71.4%/ N=45) is the most prevalent comorbidity, followed by Type 2 diabetes mellitus (51%/N=32). Thyroid disorder, CKD, and dyslipidaemia are less common, each affecting 8%/ N=5 of the population, while cardiovascular disease affects 19.4%/N=12 of participants. This distribution provides valuable insight into the comorbidity profile of the study group.

Addictive behaviour among stroke patients

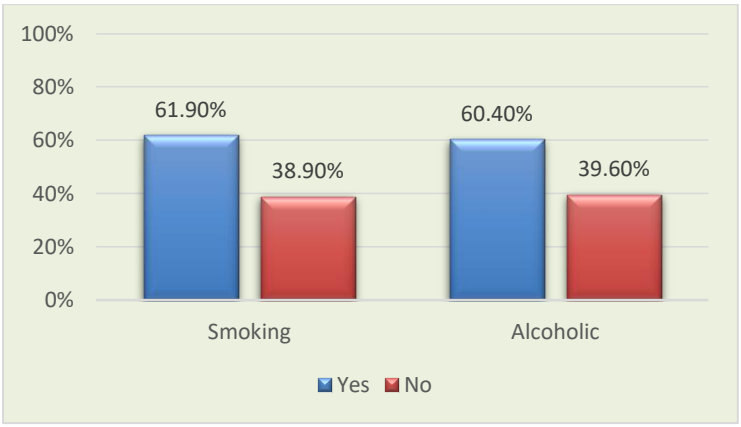
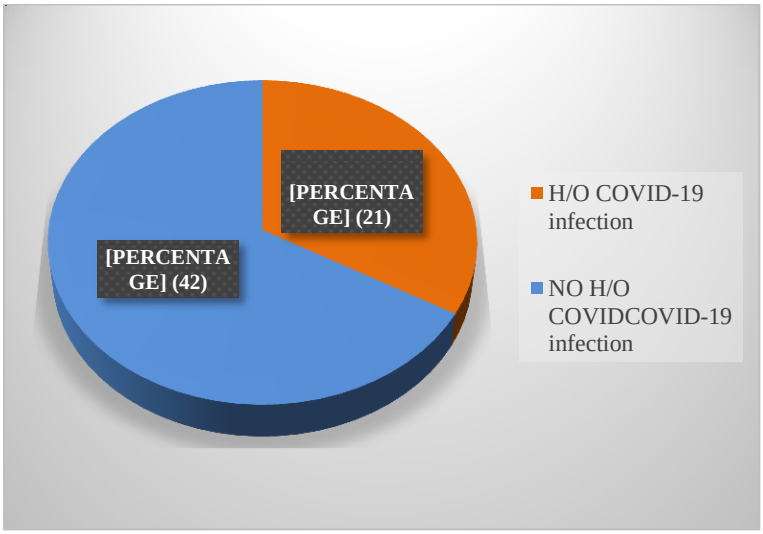


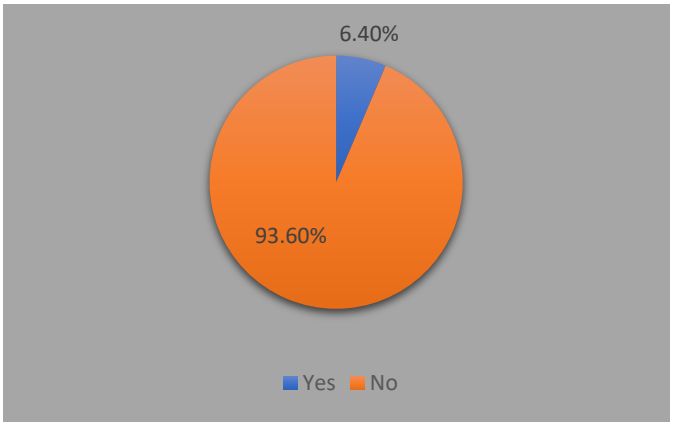
Table indicates a near-equal distribution between smokers and non-smokers, with a slightly higher proportion of participants reporting alcohol consumption (60.3%) compared to those who non-alcoholic (39.6%).

H/O COVID-19 infection among stroke patients



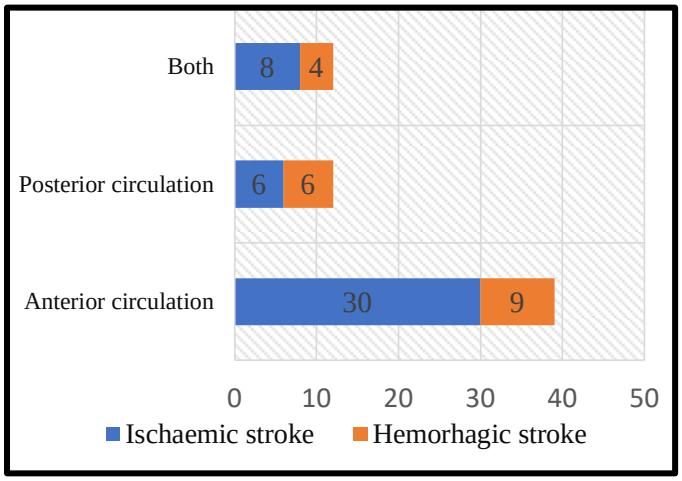
The pie chart indicates association of Previous COVID infection among stroke patients, which shows about one-third (33%) had previously been infected with COVID-19 and around two-thirds (67%) did not have previous COVID-19 infection

Family history of stroke among the patients



This shows that the vast majority of participants (93.6%) do not have a family history of the condition under study, while only a small proportion (6.4%) report a positive family history.

Distribution of Ischemic and Haemorrhagic Stroke by Circulation



- Ischemic strokes are more prevalent in the anterior circulation, with 30 cases compared to 9 in hemorrhagic strokes.
- Both types of stroke also affect the posterior circulation, but to a lesser extent.
- The occurrence of both circulation stroke is seen in ischemic and hemorrhagic cases but common in ischemic.

Distribution of Ischemic and Haemorrhagic Stroke by BMI Classification (Asian Classification)

S.no	BMI (Asian classification)	Ischaemic stroke n-47	Haemorrhagic stroke n-16
1.	Normal (18 - 22.9kg/m^2)	13 (27.6%)	12 (75%)
2.	Obesity/overweight (23-29kg/m^2)	34 (72.3%)	4 (25%)

- Higher proportion of ischemic stroke patients are categorized as overweight or obese (72.3%)
- Whereas haemorrhagic stroke patients predominantly fall within the normal BMI range (75%)

Comparison of Clinical Parameters Between Ischemic and Haemorrhagic Stroke Patients

S.no	Variable	Ischaemic stroke (Mean S.D)	Haemorrhagic Stroke (Mean S.D)	p value*
1.	Blood pressure (MAP) mmHg	98 ±17.8	118.8 ± 30.8	**0.00**
2.	ABPI	0.69 ± 0.4	1.1 ± 0.12	**0.04**
3.	BMI (kg/m^2)	25 ± 2.9	21.7 ± 2.8	**0.00**
4.	HR/min	84.8 ± 15	78.7 ± 16.3	0.17
5.	RDW (fl)	17.3 ± 2.8	13.2 ± 0.90	**0.02**
6.	NIHSS score	9.1 ± 3.6	10.3 ± 5.1	0.40
7.	mRS score	2.57 ± 0.1	3.1 ± 0.95	0.05

Independent T test p value <0.05 statistically significant shows statistically significant differences in mean values for **blood pressure (MAP)**, **ABPI**, **BMI**, and **RDW** between ischemic and hemorrhagic stroke patients. However, other parameters like heart rate, NIHS score, and mRS score do not show significant differences.

Comparison of Clinical Parameters Between Anterior and Posterior Stroke Patients

S.no	Variable	Anterior circulation (Mean S.D)	Posterior circulation Stroke (Mean S.D)	p value*
1.	Blood pressure (MAP) mmHg	102 ±9.4	124.9 ± 22.6	**0.03**
2.	ABPI	0.81 ± 0.2	1.2 ± 0.17	0.07
3.	BMI (kg/m^2)	24.8 ± 1.9	21.1 ± 2.3	**0.02**
4.	HR/min	79.1 ± 11	68.3 ± 11.3	0.09
5.	RDW (fl)	16.9 ± 1.6	14.8 ± 1.1	012
6.	NIHSS score	8.4 ± 1.5	11.9 ± 6.3	0.30
7.	mRS score	2.24 ± 0.82	4.6 ± 0.5	**0.04**

Independent T test p value <0.05 statistically significant shows statistically significant differences in mean values for **blood pressure (MAP)**, **BMI, mRS** between Anterior and Posterior stroke patients. However, other parameters like ABPI, heart rate, RDW, NIHS score do not show significant differences.

Association of factors between Ischemic and Hemorrhagic stroke patients

Chi-square test* Fischer exact test* p value <0.05 statistically significant

S.no	Variable	Category	Ischaemic stroke	Haemorrhagic stroke	P value*
1.	Age	25- 50	7(77.8)	2(22.2)	0.87
		51- 70	29(72.5)	11(27.5)	
		>71	11(78.6)	3(21.4)	
2.	Gender	Male	33(76.7)	10(23.3)	0.39
		Female	14(70)	6(30)	
3.	Comorbidity	Present	40(75.5)	13(24.5)	0.49
		Absent	7(70)	3(30)	
4.	Smoking	Yes	34(85.4)	7(14.6)	**0.03**
		No	13(61.9)	9(38.1)	
5.	Alcoholic	Yes	29(76.3)	9(23.7)	0.7
		No	18(72)	7(28)	
6.	Family history	Yes	4(100)	0	**0.02**
		No	43(73)	16(27)	
7.	COVID infection	Yes	19 (90.47)	2(9.53)	**0.02**
		No	25(59.5)	17(40.5)	
8.	BMI (Kg/m^2)	Normal	13 (52)	12 (48)	**0.00**
		Abnormal	34 (89.5)	4 (10.5)	

This table suggests that age, gender, comorbidity and addiction show no significant difference between ischemic and hemorrhagic stroke patients (all with p-values > 0.05), **BMI, family history, Smoking and H/O COVID infection** are significantly associated with stroke type (p-value = **0.00**, **0.02, 0.03 and 0.02**), with a higher proportion of ischemic stroke patients having abnormal BMI compared to hemorrhagic stroke patients.

Association of factors between Anterior and Posterior stroke patients

Chi-square test* Fischer exact test* p value <0.05 statistically significant

S.no	Variable	Category	Anterior circulatory stroke	Posterior circulatory stroke	P value*
1.	Age	25- 50	7(50)	7(50)	0.28
		51- 70	25(69.4)	11(30.6)	
		>71	10(76.9)	3(23.1)	
2.	Gender	Male	36(78.2)	10(21.8)	0.44
		Female	11(64.7)	6(35.2)	
3.	Comorbidity	Present	39(73.5)	14(26.5)	0.42
		Absent	6(75)	4(25)	
4.	Smoking	Yes	36(80)	9(20)	0.31
		No	11(61.1)	7(38.9)	
5.	Alcoholic	Yes	32(74.7)	11(25.3)	0.7
		No	15(75)	5(25)	
6.	Family history	Yes	3(75)	1(25)	1.0
		No	44(74.5)	15(25.5)	
7.	COVID Infection	Yes	16(76.2)	5(23.8)	0.08
		No	31(73.8)	11(26.2)	
8.	BMI (Kg/m^2)	Normal	5 (55.5)	4(44.4)	**0.02**
		Abnormal	43(84.3)	8(15.6)	

This table suggests that age, gender, comorbidity, addiction, previous COVID infection and family history show no significant difference between anterior and posterior stroke patients (all with p-values > 0.05), **BMI classification** is significantly associated with stroke type (p-value = **0.02,** with a higher proportion of anterior stroke patients having abnormal BMI compared to posterior stroke patients.

Common presentations of Ischemic and hemorrhagic stroke patients

Ischemic stroke		Hemorrhagic stroke	
Anterior circulatory	**Posterior circulatory**	**Anterior circulatory**	**Posterior circulatory**
Hemiplegia/Hemiparesis (42%)	Giddiness (51%)	Hemiplegia/Hemiparesis/ Speech disturbances (38%)	Giddiness /Headache (33%)
Speech disturbances/ Deviation of angle of mouth (23%)	Hemiplegia/Hemiparesis / Speech disturbances (19%)	Altered sensorium (30%)	Altered sensorium / Hemiplegia/Hemiparesis (32%)
Headache (19%)	Headache/Dysphagia (18%)	Headache / Vomiting (22%)	Speech disturbances (20%)
Altered sensorium (16%)	Visual disturbances (12%)	Deviation of angle of mouth/ Seizures (10%)	Vomiting / Visual disturbances (15%)

This table depicts that most common presentation of Ischemic stroke in anterior circulation is Hemiparesis/Hemiplegia (42%) and in posterior circulation it is Giddiness (51%), Most common presentation of Hemorrhagic stroke in anterior circulation is Hemiparesis/Hemiplegia/Speech disturbances (38%) and in posterior circulation it is Giddiness/Headache (33%),

Common Site of lesion of Ischemic and hemorrhagic stroke patients

Ischemic stroke		Hemorrhagic stroke	
Anterior circulatory	**Posterior circulatory**	**Anterior circulatory**	**Posterior circulatory**
Ganglio-capsular region (68%)	Brainstem (pons>medulla>>midbrain) (61%)	Ganglio-capsular region (56%)	Thalamus (43%)
Fronto-parietal region (31%)	Cerebellum (38%)	Lobar (parietal > frontal) (42%)	Pons (31%)

This table depicts that most common site of lesion of Ischemic stroke in anterior circulation is Ganglio-capsular region (68%) and in posterior circulation it is Brainstem (pons>medulla>>midbrain) (61%), Most common site of lesion of Hemorrhagic stroke in anterior circulation is Ganglio-capsular region (56%) and in posterior circulation it is Thalamus (43%).

Discussion

The mean age of stroke in our study is 62.1 ± 11.6, age distribution about 63.4% of patients fall within the 51-70 years age group, with a smaller proportion in the < 50 years age group - 9 (14.4%) among which 2 (22.2%) were female, 7 (77.77%) were male. In other age groups, a larger proportion of participants are male 43 (68.2%) compared to female 20 (31.8%). A study by Kaur G et al reports the mean age of stroke was 60.46 ± 14.84 years, young age group comprised only 6%[5].

The most prevalant risk factor in our study is systemic hypertension 45 (71.4%), followed by Smoking 39 (61.9%), alcohol 38 (60.40%) a near-equal distribution between smokers and non-smokers, Type 2 diabetes mellitus 32 (51%), cardiovascular disease affects 12 (19.4%) and thyroid disorder, CKD and dyslipidaemia are less common each affecting 5 (8%) of the study population, 6.4% of the patients have significant

family history. 23 (38%) of stroke patients in our study do not have any history of smoking/chronic alcohol consumption. 9 (14.28%) patients had no known risk factors and 2 of them aged less than 50 years. A study by Aiyar et al. found that hypertension was the most prevalent risk factor, affecting 79.4% of cases, followed by diabetes mellitus (41.2%), smoking (23.5%), alcohol consumption (20.6%), a history of stroke (17.6%), and ischemic heart disease (14.7%) [6.] Few other rare risk factors were identified among young stroke patients (9)- Homocysteinemia in 5 (7.93%) of which all were male, 2 (3.17%) Antiphospholipid antibody syndrome patients, 1 (1.5%) Primary polycythemia, 1(1.5%) not identifiable cause- cryptogenic. A study by Kim JS et al also stated the same pattern of risk factor distribution among anterior and posterior circulatory strokes patients[7].

Another risk factor association of COVID-19 infection with stroke showed that 33.3% of participants (N=21) had a history of COVID-19 infection and 66.7% of participants (N=42) had no history of COVID-19 infection. Average years from COVID infection to stroke in our study participants was 3.72 years. When integrated with Stroke type 90.47% of post-COVID stroke cases were ischemic, which reinforces the hypothesis that COVID-19 increases ischemic stroke risk, possibly due to hypercoagulable state, Endothelial damage, Cytokine storm. A study by Merkler et al have also identified increased ischemic stroke incidence among post-COVID patients without prior vascular risk factors, which may help explain the pattern seen in our study population[8].

This distribution provides a basis for comparing the presence of any specific risk factors or clinical outcomes between those with and without prior COVID-19 infection. This stratification provides a basis for further analysis to determine whether prior infection is associated with increased prevalence or severity of specific risk factors or clinical outcomes.

The Ischemic strokes is the commenest seen among 44 (69.84%) while hemorrhagic stroke accounts for 19 (30.16%) patients and also in study by Tribelhorn S et al stated that ischemic stroke was prevalent among 60% and hemorrhagic stroke prevalent among 40%[9].

Infarcts affecting both the anterior and posterior circulation are generally believed to have similar underlying pathophysiological mechanisms. However, there is concern that certain etiological factors may differ between these two groups, potentially influencing treatment approaches[8]. In our study Anterior circulatory strokes accounts for 39 (76%), posterior circulatory stroke accounts for 12 (23%) and also 12 patients had involvement of both anterior and posterior circulation. Among Young stroke observed in our study population (14.4%), 8 (88.88%) had ischemic stroke whereas 1 (11.11%) had hemorrhagic stroke and 4(44.44%) of these young strokes had isolated Posterior ischemic stroke compared to 3 who had isolated anterior ischemic stroke, while 2 of the young stroke patients had both anterior and posterior circulatory strokes.

Ischemic stroke is more prevalent in the anterior circulation 30 (47.6%) compared to 6 (9.52%) in posterior circulation and both type of circulatory ischemic strokes are seen among 8 (12.6%). Hemorrhagic stroke is more prevalent among the anterior circulation 9 (14.28%) compared to 6 (9.52%) in posterior circulation and both type of circulatory hemorrhagic strokes are seen among 4 (6.34%). The occurrence of both circulation types of stroke is seen in both ischemic and hemorrhagic cases but common among ischemic stroke patients. Hemorrhage in both anterior and posterior circulation is the least common (6.34%). A study by Frid P et al stated that the posterior circulation ischemic stroke prevalence ranges between 20 and 30%[10].

Higher proportion of ischemic stroke patients are categorized as overweight or obese (72.3%), 69% of males had BMI >23 Kg/M^2. 89% of anterior circulatory stroke patients and 10.5% of posterior

circulatory stroke patients had BMI >23 Kg/M^2. Whereas haemorrhagic stroke patients predominantly fall within the normal BMI range (75%). So, risk of Anterior ischemic stroke is more when BMI is more than 23 Kg/M^2. A study by Wang et al also reported that risk of stroke was positively correlated with BMI, and the association was stronger in male and ischemic stroke[11].

The presentation blood pressure was observed to be higher among hemorrhagic stroke patients with mean MAP 118.8 ± 30.8 compared to ischemic stroke patients with mean MAP 98 ±17.8 and the difference was statistically significant (P value 0.00). while observing mean MAP in anterior and posterior circulatory stroke patients it is higher among posterior circulatory stroke 124.9 ± 22.6 and in anterior circulatory stroke patients it was 102 ±9.4 and this difference was also statistically significant (P value 0.03). MAP was highest among posterior circulatory hemorrhagic stroke.

On observing Ankle Branchial Pressure Index (ABPI), ABPI is low among Ischemic stroke patients mean ABPI is 0.69 ± 0.4 compared to hemorrhagic stroke patients ABPI is 1.1 ± 0.12 which is statistically significant (P value 0.004) and ABPI is low among Anterior circulatory stroke patients- mean ABPI is 0.81 ± 0.2- mean ABPI is 0.81 ± 0.2 compared to posterior circulatory stroke patients- mean ABPI is 1.2 ± 0.17, this may be attributable to the high prevalence of ischemic stroke among anterior circulatory stroke patients. A case control study by Shahi MS et al showed that a low Ankle Brachial Pressure Index is associated with ischemic heart disease, carotid atherosclerosis, and ischemic stroke. This indicates a significant correlation between a low ABPI and the occurrence of ischemic stroke in patients[12].

Red cell distribution width (RDW) of patients on the day of admission were observed and are significantly high among ischemic stroke patients- mean RDW is 17.3 ± 2.8 fl compared to hemorrhagic stroke patients- mean RDW is 13.2 ± 0.90 fl, which were statistically significant. RDW is high among anterior circulatory stroke patients- mean RDW is 16.9 ± 1.6 fl compared to posterior circulatory patients- mean RDW is 14.8 ± 1.1 fl. RDW is highest among Anterior ischemic stroke patients. A meta-analysis by Li, Bingxian MD et al revealed that RDW was associated with increased risk of stroke and may be used as a predictor for the risk of stroke, in particular ischemic stroke[13].

On observing stroke severity with scales like NIHS and mRS score, NHIS is highest among hemorrhagic stroke patients and posterior circulatory stroke patients.

The association factors difference between the types of stroke were studied which showed that most of the ischemic and hemorragic stroke patinets are wthin in the age group of 51 to 70 years, among this age group 29 (72.5%) had ischemic stroke, 11 (27.5%) had hemorrhagic stroke patients and also anterior and posterior circulatory stroke patients are common among 51 -70 years of age, least study population falls within the age gropu less than 50 years. Among patients with comorbidities 40 (75.5%) are ischemic and 13 (24.5) are hemorrhagic stroke patients, 39 (73.5%) are anterior and 14 (26.5%) are posterior circulatory stroke patients. Whereas 10 patients - 7 (70%) ischemic and 3 (30%) hemorrhagic stroke patients, 6 (60%) anterior and 4 (40%) posterior circulatory stroke patients do not have any known comorbidities.

The association of smoking tobacco with ischemic and hemorrhagic stroke had statistically significant difference between them, among patients with history of smoking tobacco 34 (85.4%) are ischemic stroke patients compared to 7 (14.6%) are hemorrhagic stroke patients and patients with no history of smoking tobacco 13 (61.9%) are ischemic and 9 (38.1%) are hemorrhagic stroke patients. Among patients with history of smoking tobacco 36 (80%) are anterior circulatory stroke patients compared to 9 (20%) are posterior circulatory stroke patients and

patients with no history of smoking tobacco 11 (61.1%) are anterior circulatory and 7 (38.9%) are posterior circulatory stroke patients.

The association of chronic alcohol consumption with ischemic and hemorrhagic stroke had no statistically significant difference between them, 29 (76.3%) of ischemic stroke patients had among patients with history of chronic alcohol consumption 29 (76.3%) are ischemic stroke patients compared to 9 (23.7%) hemorrhagic stroke patients and among patients with no history of chronic alcohol consumption 18 (72%) are ischemic and 7 (28%) are hemorrhagic stroke patients.

Among patients with history of chronic alcohol consumption 32 (74.7%) are anterior circulatory stroke patients compared to 11 (25.3%) are posterior circulatory stroke patients and patients with no history of chronic alcohol consumption 15 (75%) are anterior circulatory and 5 (25%) are posterior circulatory stroke patients. The INTERSTROKE Study by Smyth A et al which included 12,913 cases and 12,935 controls; 25.0% (n = 6,449) were current drinkers, 16.7% (n = 4,318) former drinkers, and 58.3% (n = 15,076) never drinkers. Current drinkers were younger, male, smokers, active, and with higher-paid occupations. Current drinking was associated with all stroke and intracerebral hemorrhage (ICH), ischemic stroke. Heavy episodic drinking pattern was associated with all stroke (OR 1.39; 95% CI 1.21–1.59), ischemic stroke (OR 1.29; 95% CI 1.10–1.51), and ICH (OR 1.76; 95% CI 1.31–2.36). High level of alcohol intake was consistently associated with all stroke, ischemic stroke, and ICH. High and moderate intake were associated with increased odds of stroke, whereas low intake was not associated with stroke. However, there were important regional variations, which may relate to differences in population characteristics of alcohol consumers, types or patterns of consumption[14].

Association of Family history with ischemic and hemorrhagic stroke showed statistically significant difference, patients with family history 4 – all had ischemic stroke 4 (100%), when association is compared with anterior circulatory and posterior circulatory stroke- 3 (75%) had anterior and 1 (25%) had posterior circulatory stroke.

On studying association of BMI difference with types of strokes showed statistically significant difference. Patients with BMI more than 23 Kg/M^2 mostly had ischemic stroke 34 (89.5%) compared to hemorrhagic stroke 4 (10.5%) P value 0.01. Among patients with BMI more than 23 Kg/M^2- 34 (89.5%) had anterior circulatory stroke and 4 (10.5%) had posterior circulatory stroke, P value 0.02.

Most common presentation of anterior ischemic stroke is Hemiplegia/Hemiparesis 42%, Commonest presentation of posterior ischemic stroke is Giddiness 51%. Among hemorrhagic stroke patients the presentation symptoms were few but frequency of few of them were nearly equal. Common presentations of hemorrhagic anterior circulatory stroke patients are Hemiplegia/hemiparesis/speech disturbances 38%, followed by altered sensorium 34%. In hemorrhagic posterior circulatory stroke patients- Giddiness/headache 33%, Altered sensorium/weakness 32% are the common presentations.

Common site of lesion for Ischemic stroke in anterior circulation is Ganglio-capsular region (68%), Fronto-parietal region (31%) and in posterior circulation it is Brainstem (pons>medulla>>midbrain) (61%), Cerebellum (38%), Most common site of lesion of Hemorrhagic stroke in anterior circulation is Ganglio-capsular region (56%), Lobar (parietal > frontal) (42%) and in posterior circulation it is Thalamus (43%), Pons (31%).

Conclusion

In this study, there is statistically significant difference in risk factors between Ischemic and hemorrhagic stroke which includes Smoking

history, Family history, BMI, previous COVID-19 infection. Statistically significant difference in clinical parameters which are MAP, ABPI, RDW, these correlates with the stroke severity and type and can be used as an early predictor. There is also statistically significant difference between anterior and posterior circulatory stroke in terms BMI, MAP.

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