



CLINICO-ETIOLOGICAL PROFILE OF FIRST-TIME STROKE PATIENTS PRESENTING TO A TERTIARY CARE HOSPITAL - A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Introduction: To initiate preventive and curative measures in stroke patients, it is critical that we understand the risk factors and etiological agents involved in stroke. In this study, we aimed to study the clinical profile of the first-time stroke patients presenting to our hospital, analyze possible etiological agents and identify the risk factors of stroke in these patients.

Materials and Methods: We designed a cross-sectional study of stroke patients who presented to the Department of Medicine, GMC Jammu, from October 2018 to March 2019. We obtained history, clinical examination findings and sent blood and imaging investigations for all patients. Standard clinical definitions were used to assess the presence of clinical risk factors.

Results: A prospective study on stroke was carried out for a period of 6 months (October 2018 to March 2019). A total of 436 patients from Medicine department of Govt: Medical College and Hospital Jammu, both from indoor and outdoor were enrolled in the study. The data was collected and evaluated by reviewing case files and patient interview using preformed proforma.

Conclusion: This study gives us the clinico-etiological profile and risk factors present in stroke patients in our population. In our study, incidence of ischemic stroke was found to be higher. The occurrence of stroke steeply rises with age and was more common in male. The burden of stroke tends to be more in rural, illiterate, and low socioeconomic status population. The study reveals risk factors such as sedentary lifestyle, consumption of alcohol, tobacco smoking and underlying disease like hypertension, diabetes. Large-scale studies surveying stroke patients at multiple centers are needed to support our findings.

KEYWORDS : Diabetes, Etiology, Risk factors, Stroke.

INTRODUCTION

According to the World Health Organization (WHO), stroke is a clinical syndrome characterized by rapidly developing clinical symptoms and/or signs of focal, and at times global (applied to patients in deep coma and those with subarachnoid hemorrhage), loss of cerebral function, with symptoms lasting more than 24 hrs or leading to death, with no apparent cause other than that of vascular origin (Hatano, 1976). Stroke was found to be the second leading cause of death and was predominant at age above 60 years, simultaneously the fifth leading cause of death among age group of 15-59 years old. The next two decades predictions suggest that there would be a tripling mortality rate in the Middle East, sub-Saharan Africa and Latin America [1, 2]. According to WHO estimation, by 2050 nearly 80% of stroke cases may occur in low and middle-income countries like China and India [3]. Reliable mortality and morbidity estimate that in India stroke cases are limited due to incorrect death classification, uncertainty in identifying the causes of sudden death, multiple co-morbid diseases, and incomplete death certification. Ischemic and hemorrhagic stroke accounts for about 87% and 13%, respectively [4]. Ischemic stroke may be due to an obstruction within the blood vessel that supplies blood to the brain. Hemorrhagic stroke occurs due to the weakening of blood vessel which would rupture and bleed into the surrounding brain tissues. This blood would accumulate and compress the surrounding tissue [5-7]. Risk factors include non-modifiable factors (age, gender, race, family and previous history, low birth weight), potentially modifiable factors (excessive alcohol, hypercoagulability, drugs, oral contraceptive use, acute infection), and modifiable factors (smoking or tobacco use, obesity, residential area, diet) [8-10]. The American Heart Association/ American Stroke Association (AHA/ASA) guideline recommends neurological examination using the National Institute of Health Stroke Scale (NIHSS). The AHA/ASA recommends tissue plasminogen activator, antiplatelet (aspirin, clopidogrel), anticoagulants (heparin, warfarin), antihypertensives and lipid-lowering agents for the treatment of ischemic stroke whereas osmotherapy, neuromuscular relaxants, neuroprotection and neurorestoration therapy, reperfusion therapy and calcium channel blockers for hemorrhagic stroke [11-16]. Our study was helpful in determining the frequency and percentage of risk factors, clinical manifestations, neuroimaging finding and severity assessment, in stroke patients admitted to a tertiary care hospital.

METHODS

A prospective observational study was conducted in GMC Jammu for a period of 6-month from October 2018 to March 2019 in 436 stroke patients. The patient information was collected and analyzed by reviewing case files and patient interview. Patients diagnosed with Ischemic and hemorrhagic stroke with or without comorbid disease, age above 20 years and of both genders were included in the study. The demographic data such as age, gender, risk factors (lifestyle, diet, educational and socioeconomic status, resident areas, previous and family history, co-morbid disease), onset of stroke, and neurological severity using NIHSS, contraindication of thrombolytic therapy were determined by patient interview.

RESULTS

The study revealed that, the occurrence of stroke rises with age and was maximum in 61-80 years of age with 42.2% patients. The male-to-female ratio was nearly 2.9:1. While accounting for the co-morbid risk factors, hypertension was most common followed by Smoking, Dyslipidemia, Diabetes, alcoholism and tobacco consumption. In our study, 370 (84.9%) patients were of ischemic and 66 (15.1%) patients had hemorrhagic stroke. In ischemic stroke patients, we found that 80% had anterior cerebral circulation, 10.8% had posterior cerebral circulation involvement and 9.2% has both. Among hypertensive hemorrhagic stroke patients, thalamus was the most common site seen in 33.3% followed by basal ganglia 31.8%, cerebrum 19.7%, with 9.1% in cerebellum and 6.1% in pons. In our study, stroke was diagnosed by CT/MRI. In our study, the anterior cerebral circulation (ACA +MCA) was the most affected artery in ischemic strokes. In our study, a larger proportion (54.1%) of Ischemic stroke patients had right hemispheric brain lesion while 45.9% cases had left hemispheric lesions. Most common timing of presentation of stroke was morning hours, 6 am to 12 noon.

TABLE 1: SHOWS SEX DISTRIBUTION OF PATIENTS

SEX	NUMBER OF PATIENTS (N)	PERCENTAGE (%)
MALE	324	74.3
FEMALE	112	25.7
TOTAL	436	100

TABLE 2: SHOWS AGE DISTRIBUTION OF PATIENTS

STROKE TYPE	NUMBER OF PATIENTS (N)	PERCENTAGE (%)
ISCHEMIC	370	84.9

HEMORRHAGIC	66	15.1
TOTAL	436	100

TABLE 3: SHOWS THE TYPE OF STROKE AMONG THE PATIENTS

AGE (YRS)	NUMBER OF PATIENTS(N)	PERCENTAGE (%)
20-30	1	0.2
31-40	12	2.8
41-50	66	15.1
51-60	71	16.3
61-70	90	20.6
71-80	94	21.6
MORE THAN 80	102	23.4
TOTAL	436	100

TABLE 4: SHOWS SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STROKE

VARIABLE	CATEGORY	FREQUENCY DISTRIBUTION AMONG ISCHEMIC STROKE PATIENTS. N=370(%)	FREQUENCY DISTRIBUTION AMONG HEMORRHAGIC STROKE PATIENTS N=66(%)
1.GENDER	MALE	282(76.20)	42(63.6)
	FEMALE	88(23.8)	24(36.4)
2.FOOD HABITS	VEGETARIAN	118(31.9)	24(36.4)
	NON VEGETARIAN	106(28.6)	16(24.2)
	MIXED	146(39.5)	26(39.4)
3.FAMILY HISTORY	PRESENT	166(44.9)	20(30.3)
	ABSENT	204(55.1)	46(69.7)
4.RESIDENTIAL AREA	RURAL	216(58.4)	50(75.8)
	URBAN	154(41.6)	16(24.2)
5.SOCIAL HABITS	SMOKING	180(48.6)	32(48.5)
	ALCOHOLIC	106(28.6)	18(27.3)
	BETAL NUT USER	84(22.7)	16(24.2)
6.MEDICAL HISTORY	HYPERTENSION	280(75.7)	40(60.6)
	DIABETES	106(28.6)	26(39.4)
	DYSLIPIDEMIA	146(39.5)	28(42.4)

TABLE 5-SHOWS TIMING OF STROKE

TIME	NUMBER OF PATIENTS(N)	PERCENTAGE (%)
6am -12pm	216	49.6
12pm -6pm	114	26.1
6pm -6am	106	24.3
TOTAL	436	100

TABLE 6- DISTRIBUTION OF ACUTE ISCHEMIC STROKE PATIENTS BASED ON THE SIDE OF LESION.

DISTRIBUTION OF THE INFARCT		FREQUENCY N (370)	PERCENTAGE (%)
1.SIDE OF THE LEISON	a)RIGHT SIDE	200	54.1
	b)LEFT SIDE	170	45.9
2.SITE OF THE LEISON	a)Anterior circulation	296	80
	b)Posterior circulation	40	10.8
	c)Both Anterior and Posterior circulation	34	9.2

TABLE 7- DISTRIBUTION OF ACUTE HYPERTENSIVE HEMORRHAGIC STROKE PATIENTS BASED ON THE SIDE OF LESION.

AREA	FREQUENCY N(66)	PERCENTAGE (%)
THALAMUS	22	33.3
BASAL GANGLIA	21	31.8
CEREBRUM	13	19.7
CEREBELLUM	6	9.1
PONS	4	6.1
TOTAL	66	100

DISCUSSION

In our study, 42.2% of the patients were between the age of 61 to 80 yrs. The incidence of stroke increases with age with males more common than females. This may be the consequence of prolonged exposure to previously recognized or unrecognized risk factors or development of new risk factors which can arise due to the aging process. Dalal et al. in a population based survey in Mumbai, found the gender distribution similar to ours (17). The authors further noted that age and sex distribution pattern of Asian population are remarkably different and not at all comparable to Japanese, European, and American population. Pardiwalla et al. reported the incidence of stroke in young to be 10 % (18). Hypertension is the dominant predisposing factor for stroke and is strongly related to atherothrombotic brain infarction as well as intracranial hemorrhage. Epidemiologic studies have reported that hypertension is associated with an increased likelihood of subclinical or silent stroke, which in turn has been linked with increased risk of recurrent stroke(19). However, these observations alone do not conclusively prove causality, as increasing blood pressure could be a marker for other risk factors such as increased body weight, dyslipidemia, glucose intolerance, and the metabolic syndrome. Studies have shown that patients with diabetes mellitus have approximately twice the risk of ischemic stroke compared with those without diabetes (20). It has been proposed that dyslipidemia, endothelial dysfunction, and platelet and coagulation abnormalities are among the risk factors that may promote the development of carotid atherosclerosis in diabetics. Numerous studies have shown that dyslipidemia is a major risk factor for stroke. In our patient, population 39.5% had dyslipidemia. However, the relationship between the serum cholesterol concentration and stroke incidence appears to be more complex, because the level of risk varies with the stroke subtype(21) Although there have been no randomized controlled trials of smoking cessation for stroke prevention, observational studies have demonstrated that the risk of stroke due to smoking declines after quitting and is eliminated by 5 years later(22). Alcohol may increase or decrease the risk of stroke, depending on the level of consumption, and the type of stroke. A meta-analysis of 19 cohort and 16 case control studies found that heavy alcohol use of greater than 60 g/day increased the risk for all strokes (relative risk (RR) 1.64, 95% confidence interval (CI) 1.39-1.93), ischemic strokes (RR 1.69, CI 1.34-2.15), and hemorrhagic strokes (RR 2.18, CI 1.48-3.20)(23). Therefore, it is not the type of alcohol that is important but the amount and the pattern of intake. Literature shows that increased serum homocysteine concentrations are associated with an increased risk of cerebrovascular disease, as it results in increased risk of the large artery subtype of ischemic stroke (24). Our study has some limitations. Our study, because of time and resource constraints, had a small sample size. Furthermore, the socio-demographic profile of these patients might be different from other geographical locations in India; therefore, the generalizability of the results of our study is a concern. In our study, the anterior cerebral circulation (ACA ,MCA) was the most commonly affected in ischemic strokes. Another previous study showed that infarction was highest in central parts of the MCA territory (25). In our study the most common site of hypertensive hemorrhagic stroke was thalamus (33.3%), followed by basal ganglia (31.8%) and cerebral (19.7%); this data is again comparable with other Indian studies (26).

CONCLUSION

In the present study, we have described the various demographical and clinical characteristics of the first-time stroke patients who presented to our hospital. In addition, we looked at the various risk factors which were present in these patients. Future studies surveying larger number of stroke patients in multiple centers are recommended. This study was conducted to create awareness among public, thereby providing information on symptoms, risk, and treatment. The study also paves a way to change the behavioral pattern and prevent early recurrent stroke. Our study helps to determine adherence on the standard clinical guidelines for management of stroke and as evidence for future research. Limitation of the study includes relatively smaller sample size, the

study was attributed to a single hospital, and information on menopausal status, and use of hormone replacement therapy were not available. Another limiting factor could be non-responding of smoking among females who may tend to hide this habit due to socio-cultural reasons.

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