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CLINICO-RADIOLOGICAL PROFILE OF STROKE IN JAMMU DIVISION OF J&K, INDIA.

General Medicine

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ABSTRACT

Background: Stroke incidence and patterns are changing rapidly and variably throughout the world. Globally, ischemic stroke outnumber haemorrhagic strokes but a study from Kashmir division of Jammu and Kashmir State of India revealed that haemorrhagic stroke was more common than ischemic stroke. The present study was conducted to know which type of stroke is more common in Jammu division of J&K State and to identify the possible risk factors.

Methods: This was a retrospective study which was conducted on 500 patients with first time stroke as well as recurrent stroke presenting in Government Medical College hospital Jammu (J&K) during time period between September 2017 and August 2018. Diagnosis was made on clinico-radiological basis. Routine investigations including hemogram, biochemistry, ECG, Chest X-ray and CT Scan brain was done in all patients however screening for cardiovascular disorders, collagen profile, prothombotic states were performed wherever necessary.

Results: Acute ischemic stroke was observed in 65.6% with 5.8% having cardioembolic stroke. There was predilection of stroke among the males (55.8%) and urban population. Fifty two percent of patients suffered first ever stroke in sixth and seventh decade. Hypertension, dyslipidemia and multiple risk factors were observed in 73.6%, 55.6% and 22.4% cases respectively .

Conclusions: Ischemic stroke was the commonest stroke type observed in Jammu division of J&K state, accounting for close to two-third of stroke cases. Highest incidence was found in sixth and seventh decade of life with hypertension, dyslipidemia and poor drug compliance as the major risk factors.

KEYWORDS

Ischemic stroke, Haemorrhagic stroke, CT Scan, Jammu

INTRODUCTION

Stroke has been defined by WHO (World Health Organisation) as "rapidly developing signs of focal or global disturbance of cerebral function, lasting more than 24 hours or leading to death with no apparent cause other than vascular origin.[1] Cerebral infarction accounts for approximately 80 – 85% of stroke in comparison to 9 – 15%due to intracerebral bleed.[2] It is the 3rd most common cause of death in world after heart disease and cancer. It was considered as a disease of elderly but nowadays incidence is increasing in young.[1]

WHO estimates suggest that by 2050, 80% stroke cases in the world would occur in low and middle income countries with India and China bearing the major brunt.[3] WHO estimates for year 2020 predict that stroke will be 2nd cause of death after ischemic heart disease both in developing and developed countries.[4] Stroke has a mortality of 11% in USA and in Asian countries it kills around 3 million people every year.[1] In India 4.5% of medical admissions and 20% of neurological admissions are due to acute stroke with an incidence of 200/ lac population.[5]

Mortality rises rapidly with age and in winter season compared to summer. Stroke occurs frequently in hour or two after waking up in the morning. Stroke has a geographical, racial and social influence viz, (a) its mortality is higher in lower social class, (b) blacks are affected more than white population in USA and UK and (c) posterior circulation hemorrhage is less common in western countries than in Japan.[1,6]

Acute ischemic stroke is the most common type stroke globally (80%) but a study from Kashmir division of Jammu and Kashmir (J&K) state of India revealed that hemorrhagic stroke was more common (64.7%) than ischemic stroke.[2,7]

The current hospital based study was conducted to find out the commonest type of stroke and possible associated risk factors in a tertiary care hospital in Jammu division of J&K state of India.

MATERIALS AND METHODS

A retrospective study of 500 acute stroke patients admitted in general medicine department of GMCH Jammu, over a period of one year from September 2017 to August 2018, was undertaken.

Being very well known, Jammu & Kashmir state is known as crown of India and is located in the sub-Himalayan Mountains. It shares a border with states of Himachal Pradesh and Punjab to the south and as an international border with China in the north and east, whereas the line of control separates it from Pakistan-controlled territories of Azad Kashmir and Gilgit-Baltistan in the west and north-west respectively. The state of J&K consists of three regions: Jammu, Kashmir valley and Ladakh. Jammu is the winter capital of the state and GMCH is the tertiary care hospital located in the heart of Jammu city. Total population of Jammu Province is approximately 53, 50,811 (census 2011) distributed among 10 districts. It is seen that majority of acute stroke cases are referred or come on their own to avail the treatment facilities at this hospital.

In the present retrospective study, 500 cases of cerebrovascular accidents (excluding traumatic) were primarily diagnosed by clinical examination and further evaluated by available brain imaging modality viz. NCCT Brain, MRI/ CT Angiography or MR Venography. Oxfordshire community Stroke project Classification was used to classify ischemic stroke.

A detailed history and examination of patients had been done. All patients in whom clinical diagnosis of acute stroke was made had undergone NCCT brain at admission and repeat CT brain done as and when required.

In addition to history, clinical examination and NCCT brain, complete blood count, serum chemistry, lipid profile, chest X-ray and ECG of all patients was available. CSF analysis, MRI and MR angiography or MR venography brain had been done whenever deemed necessary. Evaluation for coagulopathy, prothrombotic states or cardiovascular diseases was performed in selected patients wherever deemed necessary.

Patients with embolic stroke with subsequent haemorrhagic transformation were considered to have ischemic stroke.

The exclusion criteria were: (1) Patients with neurological deficit secondary to non vascular causes such as intracranial space –occupying lesions or brain trauma (SDH, epidural haematoma, brain contusion). (2) Patients whose neurological deficits completely

resolved within 24 hours (TIA). (3)Patients with intracranial infections like meningitis, encephalitis or brain abscess.

Descriptive statistical methods were used for analysis of data. Since this was a retrospective study without any additional investigation or intervention done, ethical clearance was not required for this study.

RESULTS

A total of 500 cases were included in this study. The number of patients was selected over 1 year period in which total number of admissions was 28,231 in General Medicine department of Govt. Medical College Jammu. There was male preponderance with male: female ratio of 1.2:1(Table 1).

Table 1: Distribution of patients according to sex

Total no. of patients	Sex	Total no. of patients	Percentage (%)
500	Male	279	55.8
	Female	221	44.2

In our study majority of the patients were from the urban area with urban: rural ratio of 1.17: 1 .Over 52% of patients developed the first ever stroke in sixth and seventh decade with mean age of 64.5 years (Table 2).

Table 2: Age wise distribution of stroke patients

Age	No of patients	Percentage(%)
0-9	-	-
10-19	-	-
20-29	5	1
30-39	12	2.4
40-49	48	9.6
50-59	83	16.6
60-69	145	29
70-79	115	23
80-89	69	13.8
>= 90	23	4.6
Total	500	100

Hemiplegia, altered sensorium, speech disturbance, headache, vomiting and cranial nerve palsy were the most common signs and symptoms whereas seizures, visual disturbances, vomiting, vertigo were seen less frequently (Table 3).

Table 3: Presenting features of stroke patients

	Stroke type	
Variable	**Ischemic (%)**	**Hemorrhagic(%)**
Headache	11(3.35)	20(11.6)
Vomiting	14 (4.29)	35(20.3)
Hemiplegia	183(55.7)	92(53.4)
Speech disturbances	103(31.6)	29(49.8)
Altered sensorium	113(34)	79(46)
Vertigo	27(8.23)	12(6.9)
Seizures	31(9.5)	13(7.5)
Cognitive impairment	5(1.5)	-
Cranial nerve palsy	22(6.7)	6(3.4)
Visual disturbances	7(2.1)	-
Cerebeller signs	6(1.8)	1(0.58)

Ischemic stroke was found in 65.6% including 5.8% of cardioembolic strokes, whereas haemorrhagic stroke was found in 34.4% (Table 4).

Table 4: Distribution of patients according to stroke type

Type of stroke	No. of patient	Percentage (%)
Ischaemic	299	59.8
Haemorrhagic	172	34.4
Cardioembolic	29	5.8
Total	500	100

Distribution of ischemic stroke patients according to Oxfordshire Community Stroke Project Classification is shown in Table 5.

Table 5: Distribution of ischemic stroke patients according to oxfordshire community stroke project classification

Stroke type	No. of patients	Percentage (%)
TACI	190	57.9
PACI	55	16.7
LACI	45	13.7
POCI	40	12.9

TACI: Total anterior circulation infarct; PACI: partial anterior circulation infarct; LACI: lacunar infarct; POCI: posterior circulation infarct In ICH most common site involved was putamen(44.1%) then thalamus(26.7%) followed by lobar(25%) then pons(0.08%) and lastly cerebellum(0.07%).

Hypertension, dyslipidemia, poor drug compliance and multiple risk factors were the commonest risk factors found in 73.6%, 55.6%, 37% & 22.4% respectively. Anticoagulant related haemorrhage was seen in 8.8% whereas recurrent stroke was seen in 15.4% patients (Table 6).

Table 6: Pattern of risk factors/comorbid disease

Variable	No of patients (%)
Hypertension	368 (73.6%)
Diabetes mellitus	78 (15.6%)
Cad	40 (8%)
Dyslipidemia	276 (55.6%)
Smoking	76 (15.2%)
Alcohol	58 (11.6%)
Anticoagulants	44(8.8%)
Poor drug compliance	185 (37%)
Multiple risk factors	112(22.4%)
RHD	8 (1.6%)
Old CVA	77 (15.4%)

Young stroke was found in (17) 3.4% cases. Comorbid disease/risk factors in this group of patients included RHD, hypertension, smoking & oral anticoagulants. No risk or etiological factor was observed in 4% cases even after detailed investigation including ECHO, Carotid Doppler, MR angiography, screening for any prothrombotic state and vasculitic profile.

DISCUSSION

Stroke incidence and pattern is changing rapidly but variably all over the world.[5, 8, 9] Stroke seems to occur even in younger than 45 years age in developing countries where two-third mortality in stroke occurs.[5,10,11,12]

Due to lack of facilities and opportunities, rural emigration to urban areas has increased by leaps and bounds. In cities the exposure to high risk life style (sedentary life style, heavy consumption of alcohol, high fatty foods, lack of exercise and stressful life) have somehow increased the burden of stroke.[13] To help allocate resources as well as audit the intervention being done, such studies are necessary.[5]

In our study from Jammu division of J&K state of India we found Ischemic stroke as the most common (65.6%) type of stroke which is in contrast to the findings in other division (Kashmir) of the same state of J&K who reported haemorrhagic stroke to be the most common type of stroke (64.7%).[7] However our findings are consistent with global trends which report ischemic stroke to be the commonest type of stroke (80%).[14]

Over the past few decades, the stroke prevalence rate has shown increasing trend in India13 in 1970 to350/ 10000 in 2004.[15, 16, 17] Study by Truelsen et al. in 2001 showed that the average age ofstroke in developing world is 15 years earlier than that of the developed world.[18] The mean age of stroke in the present study was 64.5 years which is comparable to study done by Biswas et al, in 2009 (Indians) 64±10 years versus (Americans) 71±13 years.[19] The incidence in our study was more in age group of > 50 years that is 87%. This shows that as age increases the risk of developing stroke also increases. Similar observations were reported by Siddique Abu N (2009).[20]

Lipska et al in 2007 showed that key components of metabolic syndrome and smoking are associated with ischemic stroke in South Indians and same holds true for patients of our study.[21] In the present study, patients from urban areas slightly outnumbered rural patients whereas inverse distribution was reported by Siddique Abu N which shows that occurance of non-communicable disease is not only limited to urban areas but also shifting towards rural areas of North west Indian region.[20] It is a well-known fact that people from high socioeconomic status tend to have sedentary life style and are at greater risk of developing lifestyle diseases.

Hypertension affects millions of people worldwide and is a major risk factor for both cerebral infarction and intracerebral haemorrhage, Wolf

(1999); Fields et al (2004).[22, 23] The higher the blood pressure the greater will be the risk of stroke, Living et al, 2002.[24] Chobanian et al, 2003 reported that control of blood pressure contributes to the prevention of stroke as well as prevention and reduction of other target organ damage, including congestive heart failure and renal failure.[25]

Hypertension as a risk factor was present in 73.6% of our patients which was almost similar to 72% but less than 85% reported in United States, Sacco RL et al, and Russian, Feigin VL et al, respectively.[26, 27] These patients being on antihypertensive therapy were observed to have poor drug compliance in 37%.

The role of dyslipidemia in the pathogenesis of cerebrovascular disease is less certain than for coronary artery disease.[28] Dyslipidemia was present in 55.6%of our patients that is slightly higher than earlier studies from India.[15, 29-31] Higher prevalence of dyslipidemia in our stroke patients could be attributed to the increasing trends of diabetes, hypertension, excessive alcohol use and smoking. Diabetes was a risk factor in 15.6 % of cases in present study which is less as compared to the studies done by Wu et al., 2010(32.2%) and by Lai et al., 2008 (36.9%).[32, 33] Cigarette smoking is a potential risk factor for ischemic stroke. [34] Our study documented 15.2% patients with smoking, which is much lower than 53% reported by Wu et al., and 31.3% reported by Lai et al.[32,33]

Our study showed that total anterior circulation infarct (TACI) area was the most common area involved in ischemic stroke (57.9%) which is very high as compared to available data from developing countries but similar to that of developed countries.[32,35,36]

There are certain limitations in our study: our study was conducted in a tertiary care referral centre and could be biased towards the more disabling and complicated disease processes, it was a retrospective collection of data from medical records, use of single occasion risk factor analysis and modest sample size.

To conclude, ischemic stroke was the most common type of stroke (65.6%) in Jammu division of J&K state which is in contrast to Kashmir division of the same state of J&K where haemorrhagic stroke is the most common type of stroke (64.7%). Our findings suggest that smoking, hypertension, dyslipidemia and diabetes are the major risk factors. Smoking cessation; prevention, identification and treatment of above mentioned risk factors are crucial for preventing stroke.

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