Clinical and Aetiological Profile of Stroke in Young in North Eastern India

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ABSTRACT

Introduction: Stroke remains the second most common cause of death worldwide. Though stroke is more common in elderly a sizeable proportion of stroke do occur in young. The risk factors for stroke in young are diverse and need comprehensive approach to pinpoint the aetiology. This study was conducted on stroke in young in a tertiary care centre of North Eastern India to evaluate the clinical profile.

Methods and Materials: The present study is hospital based prospective observational study. Inclusion criteria: Indoor patients with stroke between 15 to 45 years. Exclusion criteria: Patients with meningitis, head trauma, intracranial abscess and tumour. The Modified Rankin Scale was used for the grading of disability after stroke.

Results: Out of 50 patients included in the series 54% and 46% were male and female respectively, the ratio being 1.17:1. Ischemic stroke was found in 56%, haemorrhagic stroke in 36% and subarachnoid haemorrhage in 8% of patients. Among the ischemic stroke 20% had cardio-embolic stroke. Mortality in the present series was 14%. On discharge, 4% had no disability and no patient had grade 5 disability, whereas 16%, 32%, 22% and 12% patients had grade-1, grade-2, grade-3 and grade-4 disability respectively.

Conclusion: Stroke in young is an emerging problem with a male preponderance. Ischemic stroke is more common where rheumatic heart disease is an important causative factor whereas rupture of arterio venous malformation is an important cause in haemorrhagic stroke incidence of which is proportionately higher than that of elderly.

Keywords: Abscess, Intracranial haemorrhage, Meningitis, Stroke, Subarachnoid haemorrhage.

INTRODUCTION

Among all the neurological diseases of adult life stroke clearly rank first in the frequency and importance.[1] Stroke remains the second most common cause of death worldwide.[2] Though stroke is more common in elderly and risk of stroke increases with increasing age, proportion of young adult with stroke range from <5% to 20% and that varies from one country to another.[3] In spite of its less prevalence in young population the impact of stroke is more on the individual and family if it affects the young population. In young the aetiology and risk factors for stroke are more diverse in comparison to elderly and require a more systemic approach and more diagnostic tool to find the aetiology. As there is paucity of information about the stroke in young adult from North Eastern India, therefore we conducted a study on stroke in young adult in one of the tertiary care centre in North Eastern India.

METHODS AND MATERIALS

The present study is a hospital based prospective study done in Silchar Medical College, Silchar, Assam which is one of the medical college of north eastern India that cater patient from south Assam and adjoining state of Tripura, Mizoram and Manipur. The patients were enrolled for one calendar year.

Inclusion criteria: All patients with stroke from 15 years to 45 years admitted in the department of general medicine during the study period.

Exclusion criteria: Patients with meningitis, head trauma, intracranial abscess and tumour.

Thorough clinical histories were taken for each patient and systemic examinations were carried out. All patients presented with sudden onset focal or global neurological deficit of vascular origin were subjected to routine investigation that included- complete blood count, blood sugar, Serum (Sr) creatinine, Blood Urea, Sr. electrolytes, liver function test, routine urine examination, bleeding time, clotting time, prothrombin time, viral marker for hepatitis B, hepatitis C and retroviral infection, VDRL test, ECG and CT scan brain. Special investigations like- fasting lipid profile, echocardiography, Doppler study of carotids arteries, MRI brain, contrast imaging of brain, abdominal ultrasonography, Doppler study of renal arteries, antinuclear antibodies (ANA), protein S and C estimation etc were done as per indication. The Modified Rankin Scale (mRS) was used for the grading of disability after stroke.

STATISTICAL ANALYSIS

Data were entered in MS excel spread sheet of analysis and P value of less than 0.05(<0.05) is taken as significant. Discriptive statistics were used to generate results.

The Modified Rankin Scale (mRS

The scale runs from 0-6, running from perfect health without symptoms to death.

- 0 - No symptoms.
- 1 - No significant disability. Able to carry out all usual activities, despite some symptoms.
- 2 - Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous ac-

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tivities.

- 3 - Moderate disability. Requires some help, but able to walk unassisted.
- 4 - Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted.
- 5 - Severe disability. Requires constant nursing care and attention, bedridden, incontinent.
- 6 - Dead.

RESULTS

The present study was a hospital based prospective observational study that included total 50 numbers of patients. Out of 50 patients 27(54%) and 23(46%) were male and female respectively. The male to female ratio was 1.17:1. Age and sex distribution of the patients are shown in table 1. Ischemic stroke was more common and diagnosed in 28 (56%) of patients followed by haemorrhagic stroke in 18 (36%) and subarachnoid haemorrhage in 4 (8%) of patients. Among the ischemic stroke 10 (20%) of patients had cardio-embolic stroke. Possible risk factors and aetiologies in haemorrhagic and ischemic stroke are shown in table 2. Mortality in the present series was 14%. Of those discharged, 2 (4%) had no disability, 8 (16%) patients had grade-1 disability, 16 (32%), 11 (22%) and 6 (12%) patients had grade-2, grade-3 and grade-4 disability respectively. No patient had disability of grade -5 on discharge.

Age Groups (In Years)	Male n (%)	Female n (%)	Total (%)
15-20	2(4)	1(2)	3(6)
21-25	2(4)	2(4)	4(8)
26-30	4(8)	5(10)	9(18)
31-35	3(6)	3(6)	6(12)
36-40	9(18)	6(12)	15(30)
41-45	7(14)	6(12)	13(26)
Total	27(54)	23(46)	50(100)

Table-1: Age and Sex distribution.

DISCUSSION

Stroke in young population though less common in comparison to elderly but has great impact on the patient and society as whole. There is no consensus to define the age range that constitutes young adult for the study of stroke in them but majority of the studies were done in the age group 15 to 45 years for their series which is also the case in the present study.[4] In present study male preponderance was observed, which is in agreement with the findings reported from other studies like Bevan H et al.[5] In the present series the maximum incidence was found in the age group 31-45 years which is similar to studies by Kumar HH et al.[6] Ischemic stroke is more common in the present series which is also similar to other studies like Griffiths D, Sturm J[7] but proportion of haemorrhagic stroke in this series is relatively larger in young population when compared with elderly age group as reported in the literature.[7] Among the ischemic stroke 35% patients had cardio-embolic stroke and rheumatic heart disease is the commonest cause of cardio-embolic stroke in the present study. Studies from other developing countries has shown RHD as a common cause when compare with developed countries and in the present study 21.4% of ischemic stroke was due to RHD.[5,8,9] Another common cause of cardio-embolic stroke in present study was dilated cardiomyopathy with atrial fibrillation that was observed in 10.7% of ischemic stroke. Among the modifiable risk factors hypertension, dyslipidemia, smoking and diabetes were found to be common among patients with ischemic stroke. Previous studies from India like Subha PP et al. and abroad have reported similar findings.[10,11] Other uncommon risk factors in the present study were retroviral infection, SLE and alcoholism. HIV infection has been associated with increased risk of stroke in young and a study from Nigeria reported that up to 7% of cases of young stroke were due to retroviral infection.[12] Young females with SLE especially those having associated lupus anticoagulant activity have been reported to be at increased risk for ischemic stroke in young adults.[13] In

Ischemic Stroke		Haemorrhagic Stroke	
Risk Factor And Aetiologies	n (%)	Risk Factor And Aetiologies	n (%)
Hypertension	8(28.57)	Hypertension	10(55.56)
Diabetes	4(14.28)	Alcohol abuse	2(11.11)
Smoking	2(7.14)	Smoking	1(5.55)
Alcohol abuse	2(7.14)	Dyslipidemia	2(11.11)
Dyslipidemia	8(28.57)	Retroviral Infection	1(5.55)
SLE	2(7.14)	PIH	1(5.55)
Cardio embolic		AVM	5(27.78)
RHD	6(21.43)	No identifiable risk factor	5(27.78)
		Total	18(100)
		Subarachnoid Haemorrhage	
DCMP	3(10.71)	Risk Factor And Aetiologies	n (%)
TOF	1(3.57)		
Peripartum period	5(17.86)		
Retroviral Infection	2(7.14)	Aneurysm in cerebral arteries	2(50)
Carotid artery atheroma	4(14.28)		
No identifiable risk factor	5(17.85)	No identifiable risk factor	2(50)
Total	28(100)	Total	4(100)

Table-2: Risk factors and aetiologies.

the present study two patients had sagital sinus thrombosis and both were in immediate post partum period. However, thrombosis of the cerebral venous system is an uncommon cause of young stroke and has been reported in less than 1% of the cases.[14]

Among the patients with haemorrhagic stroke, hypertension was found to be present in 55.56% of the patients. AVM rupture leading to intra cerebral haemorrhage was also found to be common cause (27.78%) in the present study. In a previous study comprising of 200 patients the most common causes of ICH were rupture of an arteriovenous malformation in 67 patients (33%), cavernous angioma in 32 (16%), and hypertension in 22 (11%).[15] Among the patient with SAH 50% had aneurysm in cerebral arteries while the rest 50% had no identifiable cause.

After thorough clinical evaluation and extensive relevant investigations no definitive risk factor or aetiology was found in 17.9%, 27.7% and 50% of ischemic, haemorrhagic and SAH respectively. In a previous study on patients with intracranial haemorrhage it has been reported that in upto 15% of the cases despite an extensive workup, including MRI no identifiable cause or risk factor could be determined.[15] Overall mortality in the present study was 14%. A previous study has reported a similar finding with an overall mortality of 15.7%.[16]

CONCLUSION

Stroke in young adults is an emerging problem and has adverse socioeconomic impact of great magnitude because of its disability factor. Males are more commonly affected. Although ischemic stroke is more common, a substantial number of patients present with haemorrhagic stroke which is proportionately higher than the elderly age group. Rheumatic heart disease is a common cause among ischemic stroke and rupture of arterior venous malformation in haemorrhagic stroke in the developing countries like India. Risk factors are more diverse and require more sophisticated investigation for diagnosis of aetiologies in stroke in young adult.

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