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A CLINICAL STUDY OF STROKE IN YOUNG IN A TEACHING HOSPITAL

Baiju Sam Jacob¹, Sreekumar B², V. Baby Paul³

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ABSTRACT: Stroke is defined as rapid onset focal neurological deficit resulting from disease of cerebral vasculature and its contents. Although classically a disease of elderly population stroke occurs in younger age group also. Stroke in young is infrequent in the west. On the contrary, Indian data gives a higher incidence of 18 to 30 percent. This study aims to evaluate the clinical profile and etiological factors leading to stroke in thirty patients in the age group 15 to 45 years admitted to Medical College, Calicut during May 2000 to April 2001. A detailed history and examination findings were recorded. All patients were subjected to CT brain. The data were collected as per Performa and analyzed. Incidence of stroke in young was 18.5 percent of total stroke patients and incidence of CVA patients admitted was 1.25 percent of the total medical admissions; both were in range as in most of Indian studies. Males and females were in the ratio 2:1 which was similar to majority of Indian studies. 80% cases were thrombotic stroke, rest 20% hemorrhagic and cortical venous thrombosis. Etiological factors were detected in 43.4 percent of cases. Rheumatic heart disease with atrial fibrillation was the major etiological cause for embolic stroke. Incidence of stroke related to pregnancy was less compared to other Indian studies. Risk Factors were detected in 63.3 percent patients which was significant in contributing to the etiology of stroke in young. Smoking and diabetes mellitus formed the most important risk factors in the study followed by untreated hypertension and dyslipidemia.

KEYWORDS: Stroke, Young, Risk Factors.

INTRODUCTION Stroke is defined as rapid onset of focal neurological deficit resulting from disease of the cerebral vasculature and its contents.¹ It is the most common life threatening neurological disease and the third leading cause of death in developed nations.¹ In Indian hospitals stroke accounts for 0.9 to 4.5 percent of total medical admissions and 9 to 30 percent of neurological admissions.¹ Although classically a disease of the elderly population with a peak incidence between Sixth and eighth decades, stroke occurs in younger age group also.²

Stroke in the young is infrequent in the west. Published data suggests that about 3 percent of total stroke belongs to this group. On the contrary, Indian data give a higher incidence ranging from 18 to 30 percent.³ Apart from dramatic consequences of stroke in these patients when permanent sequelae remains for the rest of life, the burden can be extremely heavy on the family and society in general. As far as etiology, prognosis and impact to the society are concerned, stroke in the young differs significantly from those in the elderly.⁴ The etiology of stroke in young patients is multifactorial. Premature atherosclerosis and associated risk factors play an important role⁵. Other factors like cardiac emboli and hemorrheological factors have to be considered. Prognosis and recurrence rate is largely dependent on the underlying cause. This study aims to evaluate the clinical profile and etiological factors leading to stroke in thirty patients in the age group 15 to 45 years admitted to Medical College Hospital, Calicut during a period of one year.

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MATERIALS AND METHODS: Thirty cases of stroke below the age of 45 years admitted to the medical and neurology wards of Medical College Hospital, Calicut over a period of 12 months, from May 2010 to April 2011 forms the basis of this study. All cases with suspicion of non-vascular causes were excluded. A detailed history of present as well as past illness was recorded. Previous history of transient ischemic attacks, systemic hypertension, diabetes mellitus and migraine were noted. Personal history of smoking and alcohol intake was also noted. All systems were examined in detail and findings recorded. All patients were subjected to CT scan of brain. MRI scan was done only in selected cases. ECG and chest X- ray were taken in all patients. Cases suspected of heart disease were confirmed by echo. The data were collected as per the Performa and analyzed.

RESULTS: Thirty patients with stroke below the age of 45 years were included in the study, out of a total admission of 12960 admissions to the medical wards during the study period. A total of 162 patients were admitted with CVA during this period hence the incidence of CVA patients during the study period was found to be 1.25 percent and incidence of stroke in young was 18.5 percent of total stroke patients. As shown in Table-1 out of the 30 patients studied 66.66 percent (20 patients) were males and rest 33.34 percent females. The lowest number of patients was in the 15 to 25 year age group and highest in the 35 to 45 age group.

Age (years)	15-25	26-35	36-45
Male	3	6	11
Female	2	4	4
Total	5	10	15

Table 1: Age and sex wise distribution of patients

Disease	No. of Patients	Percentage
Diabetes Mellitus	9	30
Hypertension	4	13.3
Previous Stroke	0	0
TIA	2	6.67
Rheumatic Heart Dis	5	16.7
MVP	1	3.3
Coronary Artery Dis	3	10
Migraine	0	0
Collagen Vascular Dis	2	6.67

Table 2: Various Co-morbidities in the Study patients

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Etiological Factors	No. of Patients	Percentage
Valvular Heart Disease	5	16.7
Atrial Fibrillation	3	10
Intracerebral Hemorrhage	4	13.3
Post-Partum Cortical Vein Thrombosis	2	6.67
SLE	1	3.3
Behcet's Disease	1	3.3

Table 3: Various Etiological Factors in the Study Population

Risk Factors	No. of Patients	Percentage
Hypertension	4	13.3
Dyslipidemia	4	13.3
Smoking	12	40
Alcoholism	4	13.3
Pregnancy	2	6.67
Diabetes Mellitus	9	30

Table 4: Various Risk Factors detected in the Study

52 percent of patients presented with weakness of right half of the body (hemiparesis), 36 percent with weakness of left side and 12 percent with other focal neurological deficits like visual disturbances and cerebellar signs. 16 percent patients had altered level of consciousness ranging from disorientation to stupor. 24 percent had convulsion during the onset of stroke. They had no history of seizures in the past. 24 percent of patients had speech disturbances at the time of admission ranging from dysarthria to global aphasia. Two patients gave history of transient ischemic attack in the past (Table-2). Four patients were hypertensive in the past with irregular treatment and three patients gave history of ischemic heart disease in the past, all of them were males. Thirty percent (9 cases) of patients were diabetic with no regular treatment or follow up. Four patients had dyslipidemia with total cholesterol above 250 mg % with rise in LDL cholesterol above 130 mg % (Table-3). 16.7 percent (5 cases) of patients were diagnosed to have rheumatic heart disease, two were males and three were females. One male patient was diagnosed to have Behcet's disease. One female patient with stroke had systemic lupus erythematosus (table-3). Two patients had stroke due to cortical vein thrombosis, one patient had APLA positive. In the personal history 12 patients were chronic smokers and four patients were habituated to use of alcohol, all of them males (Table-4).

Normal	22	73.33 %
Atrial fibrillation	3	10 %
Bradycardia	2	6.67 %
Non-specific ST- T changes	3	10 %

Table 5: ECG changes in thirty patients with stroke

CT scan of brain studied in 30 patients showed 24 cases of infarct, four cases of intra cerebral hemorrhage and two cases of cortical venous thrombosis.

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MCA Territory	21	70%
ACA Territory	1	3.4%
PCA Territory	2	6.6%
Vertebrobasilar	2	6.6%
Lacunar	4	13.4%

Table 6: Topography of Infarction

DISCUSSION: Stroke in the young is infrequent in the west. Published data suggests that about 3 percent of total stroke belongs to this group¹. On the contrary, Indian data gives a higher incidence ranging from 18 to 30 percent.² In Indian hospitals stroke accounts for 0.9 to 4.5 percent of total medical admissions. In our study incidence of stroke in young was 18.5 percent of total stroke patients and the incidence of CVA patients during the study period was found to be 1.25 percent of the total medical admissions, both of which were in the same range as reported in most of the Indian studies (Sreenivas et al³ parsi study⁶). The study showed a 2:1 male female ratio which was similar in majority of Indian studies.^{3, 6} The maximum no of cases were seen in 35-45 age group (Table-1). Out of thirty patients 80 percent had stroke due to infarction and rest 13.3 percent and 6.7 percent due to hemorrhage and cortical vein thrombosis respectively. A definitive etiological factor could be identified in 43.4 percent of cases. Significant risk factors were present in 63.3 percent cases. Smoking and diabetes mellitus being the most important risk factors followed by untreated hypertension and dyslipidemia. Smoking has been clearly linked to stroke.⁵ Data from large prospective studies have shown that smokers have 30 percent higher death rates than non smokers.⁷ Framingham study showed that male smokers develop stroke three times more frequently as compared to non-smokers. Forty percent of the study group was smokers; hence it forms a definitive risk factor for occurrence of stroke in young. Alcohol consumption is viewed as a risk factor in ischemic stroke by several authors.^{8, 9} In the study only four patients were habituated to use of alcohol. Large sample size is necessary to establish the role of alcoholism as a risk factor in young stroke.

Diabetes mellitus as risk factor was significantly seen in the study accounting for 30% of patients. Majority were on irregular treatment. Regarding hypertension as a definite risk factor for stroke, epidemiological studies have shown that stroke and cardio vascular diseases are increased in patients with hypertension.^{10, 11} In our study four patients had essential hypertension with irregular treatment. Dyslipidemia with high LDL and low HDL levels are contributory factors to the development of stroke.¹¹ In our study four patients had elevated total cholesterol with high LDL fraction. Majority of the patients in the study (80%) were stroke due to infarction, rest 18.3 percent and 6.7 percent as a result of hemorrhage and cortical venous thrombosis respectively. Of 24 patients with infarct eight had definite source to account for embolic etiology. In Indian studies Rheumatic heart disease forms the most common etiology for embolic stroke (Koul et al¹², Dalal et al¹³). In this study five patients had Rheumatic heart disease predisposing to stroke, out of which three patients had atrial fibrillation. One case was diagnosed to have SLE and one case as Behcet's disease. This patient had recurrent oral and genital ulcers and arthralgia. Pathergy test was positive. CT scan showed infarct in right internal capsule. Nervous system involvement in Behcet's disease is reported to be seen in less than 5% cases and is considered as a rare cause of stroke¹⁵. Two patients had stroke

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related to pregnancy, due to cortical vein thrombosis of which one patient was APLA positive. Incidence of stroke related to pregnancy and puerperium is high in Indian studies compared to western studies¹⁶. Our study showed only 6.7 percent incidence regarding stroke related to pregnancy which was less compared to other Indian studies (Bansal et al¹⁶). Better health care system, hospital deliveries and disparity in the number of patients attending different departments may have played a role in reducing this incidence. Other etiological factors of stroke in young like polycythemia, leukemia, sickle cell disease, macro globulinemia, migraine etc. were not present in this study.

CONCLUSION: In the study incidence of stroke in young was 18.5 percent of total stroke patients and the incidence of CVA patients during the study period was found to be 1.25 percent of the total medical admissions, both of which were in the same range as reported in most of the Indian studies. Incidence of stroke in young males and females were in the ratio 2:1 which was similar in majority of Indian studies. 80 percent were thromboembolic stroke and rest hemorrhagic and cortical vein thrombosis. Etiological factors were detected in 43.4 percent of cases. Rheumatic heart disease with atrial fibrillation was a major etiological cause for embolic stroke in the study. Collagen vascular disease like SLE and Behcet's disease were less common causes of stroke in our study. It was seen that only 6.7 percent incidence regarding stroke related to pregnancy which was less compared to other Indian studies. better health care system, hospital deliveries and disparity in the number of patients attending different departments. Risk Factors were seen in 63.3 percent patients which was significant in contributing to the etiology of stroke in young. Smoking and diabetes mellitus formed the most important risk factors in the study followed by untreated hypertension and dyslipidemia. Hence educating the general public and health providers in decreasing the incidence of Rheumatic Heart Disease by prevention and early treatment of rheumatic fever, control of diabetes, avoidance of smoking, adequate antenatal and peripartum care etc. are of great importance in decreasing the incidence of this highly disabling disease.

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AUTHORS:

1. Baiju Sam Jacob
2. Sreekumar B.
3. V. Baby Paul

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of General Medicine, Travancore Medical College, Kollam, Kerala.
2. Professor, Department of Biochemistry, Travancore Medical College, Kollam, Kerala.
3. Professor, Department of General Medicine, Travancore Medical College, Kollam, Kerala.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Baiju Sam Jacob,
Associate Professor,
Department of General Medicine,
Travancore Medical College,
Kollam – 691589, Kerala.
E-mail: sambjacob@yahoo.com

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