

STROKE IN YOUNG AGE - STUDY OF 50 CASES

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Abstract:

Stroke in young age is relatively uncommon but has serious impact on the affected family as well as society. The causes are more diversified and differ as compared to the elderly. Overall prognosis is better than elderly but there is still significant morbidity and mortality. We studied consecutive 50 stroke patients between the age of 15-45 admitted in Mymensingh Medical College Hospital. The objective of this study was to evaluate the aetiological pattern, associated risk factors and in-patient outcome. Mean age of the patients was 35.8 ± 7.39 SD (years), female male ratio was 1 : 1.27. Infarction was found in 60% cases. Haemorrhage was in 40% cases. Dyslipidaemia was mostly associated risk factor in both infarction (83.3%) and in haemorrhage (75%). In 74% cases aetiology could not be identified. High prevalence of dyslipidemia as associated risk factor may indicate premature atherosclerosis. Overall in-patient mortality was 12%. Mortality in haemorrhagic strokes is higher.

Introduction:

Stroke is the leading cause of adult disability and is the second commonest cause of death worldwide.¹ The disorder usually occurs in middle aged and elderly. It is relatively uncommon in young adults but the effect may be devastating for the affected individual and their families. The incidence of stroke in young adults is variable among different studies and surveys. Like in older adults, stroke in younger adults is typically categorized as primarily ischemic or hemorrhagic. Transient ischaemic attacks are rare in young age. Haemorrhagic strokes are relatively more common. The cause can be found in 55-93% young patients²⁻⁴ and are more heterogenous and differ dramatically compared to the elderly and also as in infants and children. Ischemic etiologies include cardioembolic, atherosclerotic disease, and nonatherosclerotic cerebral vasculopathies. Hemorrhagic strokes include subarachnoid and intracerebral types. Up to 45% of strokes in young adults are due to spontaneous intracerebral hemorrhage. Vascular malformations, aneurysms, hypertension, illicit drug use, coagulation abnormality, eclampsia are the main causes. In cases of subarachnoid haemorrhage, ruptured aneurysm, arteriovenous malformation, venous angioma are responsible.⁵ Of particular note in young adults are

stroke causes such as haematologic disorders, substance abuse, trauma, dissections, oral contraceptive use, pregnancy and postpartum states, and migraine. Stroke that remain without a definite cause even after extensive work up are classified as cryptogenic. These constitute about 30-40% of all strokes. Clinical manifestations and management are usually similar to older population with some aspects of treatment are given when specific causes are found. Overall prognosis is better than older patients despite significant morbidity, dependency and mortality.

Materials and Methods:

This is an observational study done from January to June, 2008 in Mymensingh Medical College Hospital which is a tertiary referral centre for the districts of greater Mymensingh. We studied consecutive 50 cases of stroke patients aged between 15 and 45 years. Detailed history was taken and all patients were examined thoroughly to elicit the aetiological and risk factors. All were investigated with routine blood count, urine examination, blood sugar, Lipid profile, serum creatinine, ECG, Chest X-ray and CT scan of brain. Further investigations were done according to the clinical and laboratory findings. Treatment was given accordingly and in-patient outcome were observed.

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Results:

50 cases of stroke patients involved in this study aged between 15 to 45 years with a mean age of 35.8 (+/- 7.39SD) years and male, female ratio was 1: 1.27.

Mortality rate was 12%. Table-I describes variation of stroke patients in male, female distribution and sum of each case with percentage.

Table-I
Type of stroke with gender variation

Type	Male	Female	Total
Infarction	17 (34%)	13(26%)	30 (60%)
Intracerebral haemorrhage	10 (20%)	08 (16%)	18 (36%)
Subarachnoid haemorrhage	01 (2%)	01 (2%)	02 (4%)
Total	28 (56%)	22 (44%)	50 (100%)

Table-II
Stroke patients with infarction and haemorrhage in different age groups.

Age group (years)	Infarction (%)	Haemorrhage (%)	Total (%)
15-20	0 (0)	1 (2)	1 (2)
21-25	3 (6)	2 (4)	5 (10)
26-30	5 (10)	1 (2)	6 (12)
31-35	7 (14)	9 (18)	16 (32)
36-40	7 (14)	2 (4)	9 (18)
41-45	8 (16)	5 (10)	13 (26)

Table-II, patients are distributed in 6 age groups. In each group, patients are divided into infarction and haemorrhagic types.

Table-III describes different risk factors in 30 patients with infarctive stroke. Dyslipidemia is associated with highest 83.3% patient. 69.2% female patients have taken OCP.

Table-III
Different risk factors of infarctive stroke with male, female distribution.

Risk factors	Male	Female	Total
Dyslipidemia	14(46.7%)	11(36.6%)	25(83.3%)
Hypertension	5 (16.7%)	5 (16.7%)	10 (33.4%)
Smoking	8(26.7%)	1(3.3%)	9(30%)
OCP		9(69.2%)*	
Family H/O stroke	5(16.7%)	2(6.6%)	7(23.3%)
Family H/O Hypertension	5(16.7%)	1(3.3%)	6(20%)
Family H/O IHD	2(6.7%)	19(3.3%)	3(10%)
DM	2(6.7%)	0(0%)	2(6.7%)
IHD	1(3.3%)	1(3.3%)	2(6.7%)
Alcohol	1(3.3%)	0(0%)	1(3.3%)

Table-IV , lipid profile of patients are described. Highest 73.2% patients have high level of LDL.

Table-IV
Lipid profile of patients with infarctive stroke.

Lipid profile	Male	Female	Total
High LDL (≥ 100 mg/dl)	18 (59.9%)	4 (13.3%)	22 (73.2%)
Low HDL (≤ 35 mg/dl)	14 (46.6%)	4 (13.3%)	18 (59.9%)
High Cholesterol (>200 mg/dl)	8 (26.6%)	2 (6.6%)	10 (33.2%)
Triglyceride (>150 mg/dl)	4(13.3%)	4(13.3%)	8(26.7%)

Table-V shows patients with haemorrhagic stroke, 20 in numbers, with different risk factors. Highest 75% patients have Dyslipidemia.

Table-V
Different risk factors of haemorrhagic stroke with male, female distribution.

Risk factors	Male	Female	Total
Dyslipidemia	8(40%)	7(35%)	15(75%)
Hypertension	7(35%)	5(25%)	10(60%)
Family H/O Hypertension	7(35%)	3(15%)	10(50%)
Smoking	9(45%)	1(5%)	10(50%)
Family H/O stroke	9(45%)	0(0%)	9(45%)
DM	3(15%)	1(5%)	4(20%)
Family H/O IHD	3(15%)	1(5%)	4(20%)
OCP		3(33.3%)*	
IHD	1(5%)	0(0%)	1(5%)
Alcohol	1(5%)	0(0%)	1(5%)

Table-VI, highest 70% patients have high lipid level.

Table-VI
Lipid profile of patients with haemorrhagic stroke.

Lipid profile	Male	Female	Total
High LDL (≥ 100 mg/dl)	8(40%)	6(30%)	14(70%)
Low HDL (≤ 35 mg/dl)	8(40%)	4(20%)	12(60%)
Triglyceride (>150 mg/dl)	8%(0(%)	8(40%)
Cholesterol (>200 mg/dl)	2(10%)	0(0%)	2(10%)

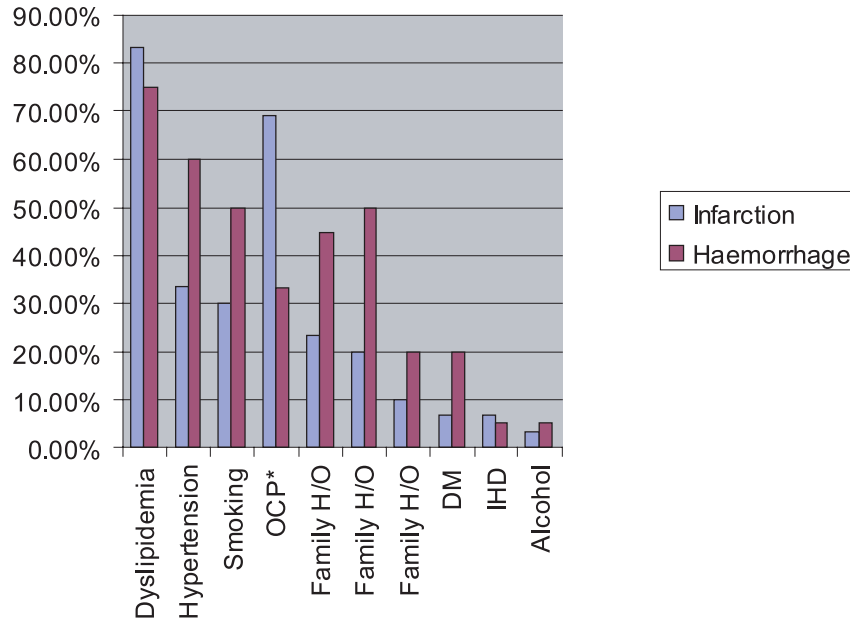


Fig.-1: Risk factors associated with stroke

Fig.-1, the bar chart shows different risk factor of infarctive and haemorrhagic stroke in association with percentage of patients involved.

Table-VII
Underlying causes of different types of stroke

Infarction—	Cardioembolic disease	- 4 (8%)
	Vasculitis	- 2 (4%)
	Undetected	- 24 (48%)
Intracerebral haemorrhage	Malignant hypertension	- 4 (8%)
	Anticoagulant drug	- 1 (2%)
	Eclampsia	- 1 (2%)
	Undetected	- 12 (24%)
Subarachnoid haemorrhage—	Arteriovenous malformation	- 1 (2%)
	Undetected	- 1 (2%)

Table-VII describes different aetiological variation of types of stroke. Maximum underlying causes failed to detect.

Table-VIII
Short term outcome of different types of stroke

Stroke	Improved	Expired	Mortality
Infarction	30	0	0%
Intracerebral haemorrhage	13	5	27.8%
Subarachnoid haemorrhage	1	1	50%
Total	44	6	12%

Table-VIII shows outcome of patients at the time of discharge. Morbidity rate is significant (50%) in subarachnoid haemorrhage.

Discussion:

Though stroke in young adults was thought to be relatively uncommon previously, recent studies indicating that incidence is not that uncommon⁵. In our study, we considered 15 to 45 years as young and most of the patients were within 31 to 45 years of age. Gender variation was not very much significant with slight male predominance and consistent with other studies^{5,6}. Though it is observed in many studies that haemorrhages are the more common than infarction in young age⁶, 60% strokes are infarctive in our study population and only 4% of strokes are due to subarachnoid haemorrhage which varies from other studies⁶. Among the associated risk factors in infarctive stroke cases, dyslipidemia is present in 83.3% cases. Other mostly associated risk factors are hypertension, smoking, OCP, family history of stroke. In haemorrhagic cases, dyslipidemia is again found to be the highest associated risk factor present in 75% cases. Other frequent factors are hypertension, family history of hypertension, smoking, family history of stroke. Diabetes mellitus was not commonly associated risk factor found in our study like other studies.⁵ Alcohol is found to be associated in least cases in both infarctive and haemorrhagic stroke. Hypertension is more frequent in haemorrhagic strokes than Infarctive cases. OCP is more commonly associated with infarction than haemorrhage. Dyslipidemia remains as a silent risk factor regarding both Infarctive and haemorrhagic stroke. In our study we have found that associated lipid abnormality is high LDL in both Infarctive and haemorrhagic strokes present in 73.2% and 70% cases respectively. Low HDL is also common in both types 59.9% and 60% cases respectively. High cholesterol level is found to be more associated with infarction than haemorrhage. Regarding aetiology, only 8% are due to cardioembolic disease, which is not so common as compared to other studies⁵⁻⁷. However, in some studies, it was found that cardioembolic disease as cause of infarction is less common in developing countries in contrast to atherothrombotic disease which is more common⁸⁻¹⁰. Infarction due to vasculitis is 4%. Malignant hypertension causing intracerebral haemorrhage are 8%. Anti coagulant drugs, eclampsia causing intra cerebral haemorrhage in 2% cases each. Arteriovenous malformation was responsible for subarachnoid

haemorrhage in 1 patient. In 74% cases (48% Infarctive, 24% intracerebral haemorrhage and 2% subarachnoid haemorrhage) aetiology could not be identified. It is a matter of debate whether these can be termed as cryptogenic as we could not do angiogram, transoesophageal echocardiogram or other extensive invasive investigations due to unavailability and unaffordability. However as dyslipidemia is highly prevalent as associated risk factor, it is likely that premature atherosclerosis may consist a considerable proportion of aetiology of young stroke. In-patient outcome of Infarctive cases in our study population is excellent but of haemorrhagic cases in-patient mortality is higher. Overall mortality is consistent with other studies.

Conclusion:

Among all stroke, young strokes cast a significant proportion. To find out the aetiology is of paramount importance to prevent new cases and recurrence. Premature atherosclerotic disease may be the silent killer. Conventional investigations may not identify the causes in many cases. Extensive laboratory work up to be needed to find out the causes in this group. However, stroke in young adults has a serious impact on the victim's family and the society as well. For a precise evaluation of this problem, large scale studies are of crying need as long term prognosis is likely to be better than older adults if treated properly.

Limitations:

Small study population, unavailability and unaffordability of necessary extensive invasive investigations are limitations of our study. Moreover, interpretations regarding association of risk factors need case control study.

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