

Original Article

Clinical Presentation of Ischaemic and Haemorrhagic Stroke and its Relation to Lipid Profile

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Abstract

Introduction: Stroke is a major health hazard in both developed and developing countries. Dyslipidaemia is one of the important risk factors for stroke. The purpose of the present study was to identify clinical presentations of both ischaemic and haemorrhagic stroke, and to find out correlation between stroke and lipid profile.

Methods: The observational study was conducted in the Department of Medicine at Sher-e-Bangla Medical College Hospital, Barishal from April to September 2013 for a period of 6 months. All the stroke patients over 20 years of age of both sexes were selected as study population. After admission at the hospital, history was taken from the patients or the attendants. The clinical presentation was recorded in a pre designed data collection sheet. Fasting lipid profile was measured in every stroke patient.

Results: Total 100 stroke patients were enrolled for this study, of them 36 were haemorrhagic and 64 were ischaemic stroke patients. The mean \pm SD of age were 63.945 ± 8.84 and 62.26 ± 14.40 in haemorrhagic and ischaemic stroke patients respectively ($p > 0.05$). Among both haemorrhagic and ischaemic stroke patients maximum 61.1% and 60.9% used to have sedentary work. Impaired level of consciousness was more common among the haemorrhagic stroke patients (91.7%) than ischaemic stroke patients (57.8%) group and the association is statistically significant ($p = 0.001$). Limb weakness was the commonest presentation in both haemorrhagic (91.7%) and ischaemic (87.5%) stroke patients. The mean \pm SD of total cholesterol was 173.47 ± 61.96 and 178.22 ± 54.79 in haemorrhagic stroke and ischaemic stroke patients respectively ($p < 0.05$).

Conclusion: Older age, male sex, sedentary work and dyslipidaemia were susceptible to be affected in stroke. Among lipoproteins, elevated total cholesterol, triglycerides and LDL showed strong correlation with both ischaemic and haemorrhagic strokes.

Keywords: Stroke, Presentation, Lipid profile

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Introduction

Acute stroke is characterized by the rapid appearance (usually over minutes) of a focal deficit of brain function due to non traumatic, vascular pathology, most commonly a hemiplegia with or without signs of focal higher cerebral

dysfunction (such as aphasia), hemi sensory loss, visual field defect or brain stem deficit¹.

Stroke is a major health hazard in both developed and developing countries. Among all the neurological diseases of adult life, cerebrovascular disease clearly ranks first in

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frequency and importance. At least 50% of neurological disorders in a general population are of this type².

Annually 16.3 million people suffer from stroke worldwide, among which 11.2 million events occur in developing countries like ours and about 5.8 million people die of stroke each year, the two-thirds of which occurs in developing countries³. Stroke incidence rate rises exponentially with increasing age with a hundred fold increase in rates from 3 per 1000 population in the 3rd and 4th decades to almost 300 in 8th and 9th decade⁴.

Stroke patients present with various symptoms. It usually occurs without warning. Occasionally there may be preceding headache especially with intracerebral or subarachnoid haemorrhage. Neurological symptoms most often develop within a few minutes, although they can develop in an irregular manner over several hours. The predominant neurological presentation is hemiplegia⁵. Other common neurological presentations are dysphasia, dysarthria, dysphagia, visual disturbance, brain stem deficit and loss of consciousness. The consequences of a stroke and the severity depend on where in the brain it has occurred and extent of damage. In stroke, ischaemic infarction constitute 80% to 85% and 15% to 20% is caused by haemorrhages in the western world, while haemorrhages constitute a larger percentage in Asia⁶.

To make a diagnosis of stroke, detailed history and thorough clinical examination is mandatory followed by computerized tomography (CT) scan of the brain for confirmation. But in our country, sometimes it is not possible to do CT scan in all cases due to poverty and lack of facility. So the clinicians have to depend largely on the clinical presentation to distinguish different types of stroke.

Dyslipidaemia is an essential risk factor for atherosclerotic diseases (e.g. coronary heart disease, stroke & peripheral arterial disease). In United States, 40% patients of ischaemic stroke suffer from dyslipidaemia in association with other risk factors⁷. It is a modifiable risk factor and nowadays various lipid-lowering drugs are available. So, early detection of dyslipidaemia and appropriate measures can prevent stroke and its morbid outcome in a number of patients.

Materials and methods

It was a prospective observational study, performed on the indoor patients of Department of Medicine at Sher-e-Bangla Medical College Hospital, Barishal, Bangladesh, over a period of 6 months from April to September 2013. Total 100 patients suffering from stroke were included in the study. Both male and female patients with age >20 years who presented with acute or recurrent stroke confirmed by CT scan were included in the study. Patients with transient ischaemic attack or already on anti lipid drug were excluded.

Patients that dropped out or expired before investigations were completed or refused to give consent to take part in the study were also excluded.

Different types of variables were evaluated. Demographic variables like age, sex, nature of work, clinical finding variables like impaired level of consciousness, limbs weakness, inability to talk/ slurred speech, deviation of mouth, headache, vomiting, vertigo, convulsion, onset, interval between onset of stroke and hospitalization were evaluated. Lipid profile was done including total cholesterol (TC), HDL, LDL, triglycerides (TG).

After admission at the hospital, informed written consent was obtained. Then history of illness was taken from the patients or attendants. Clinical presentation was recorded, and fasting lipid profile was measured in case of every stroke patient that was included in this study.

Data were collected using a preformed data collection sheet, and statistical analysis was performed by using Windows-based software devised with Statistical Packages for Social Sciences (SPSS-17). Ethical approval was taken prior to the commencement of the study.

Results

Among the patients, maximum (64.0%) had ischaemic stroke and 36.0% had haemorrhagic stroke (Table 1).

Table 1: Distribution of study subjects by type of stroke (n=100)

Type of stroke	Frequency	Percentage
Haemorrhagic	36	36.0
Ischaemic	64	64.0
Total	100	100.0

Among 36 haemorrhagic stroke patients, maximum 15 (41.7%) patients were in age group 61-70 followed by 13 (36.1%) in age group 51-60 years. Among 64 ischaemic stroke patients, maximum 19 (29.7%) were in age group 51-60 years followed by 17 (26.6%) in age group 61-70 years. The difference between these two group was not statistically significant ($p>0.05$) (Table 2).

Among haemorrhagic stroke patients, 20 (55.6%) were male and 16 (44.4%) were female, and among ischaemic stroke patients 41 (64.1%) were male and 23 (35.9%) were female (Figure 1).

While considering nature of work, maximum had sedentary work among both haemorrhagic (61.1%) and ischaemic (60.9%) stroke patients (Figure 2).

Table 2: Distribution of study subjects by age in groups (n=100)

Age	Group		p-value
	Haemorrhagic stroke (n=36)	Ischaemic stroke(n=64)	
d" 40 years	0 (0.0)	6 (9.4)	0.160
41 -50 years	3 (8.3)	10 (15.6)	
51 -60 years	13 (36.1)	19 (29.7)	
61 -70 years	15 (41.7)	17 (26.6)	
> 70 years	5 (13.9)	12 (18.8)	
Total	36 (100.0)	64 (100.0)	
Mean ± SD	63.945 ± 8.84	62.26 ± 14.40	

Chi-square test is done to measure the level of significance. Figure within parentheses indicates percentage in column.

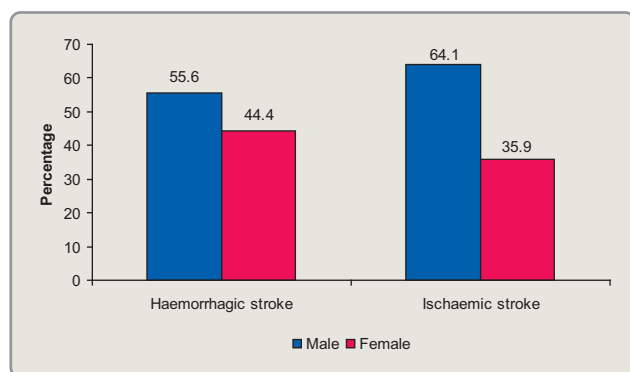


Figure 1: Bar diagram showing distribution of patients by sex

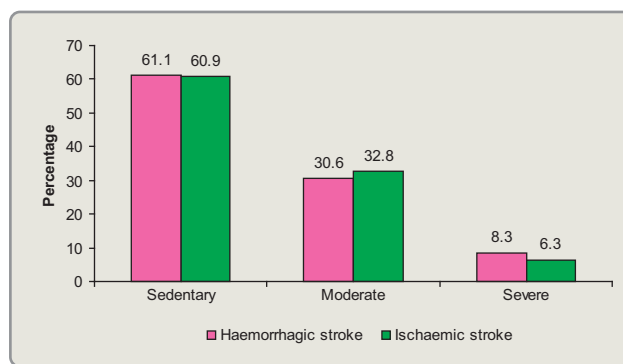


Figure 2: Bar diagram showing nature of work of the patients

Table 3: Distribution of study subjects by presenting complaints in groups (n=100)

Presenting complaints	Group		p-value
	Haemorrhagic stroke (n=36)	Ischaemic stroke(n=64)	
Impaired level of consciousness	33 (91.7)	37 (57.8)	0.001
Limb weakness	33 (91.7)	56 (87.5)	0.523
Inability to talk/slurred speech	26 (72.2)	53 (82.8)	0.212
Deviation of mouth	14 (38.9)	41 (64.1)	0.015
Headache	23 (63.9)	12 (18.8)	0.001
Vomiting	25 (69.4)	13 (20.3)	0.001
Vertigo	17 (47.2)	12 (18.8)	0.003
Convulsion	10 (27.8)	9 (14.1)	0.093
Onset			0.004
Sudden	23 (63.9)	22 (34.4)	
Gradual	13 (36.1)	42 (65.6)	
During			0.001
Sleep	4 (11.1)	28 (43.8)	
Work	26 (72.2)	35 (54.7)	
Excitement	6 (16.7)	1 (1.6)	
Interval between onset of stroke and hospitalization			0.001
Within 24 hrs	14 (38.9)	45 (70.3)	
48 hrs	18 (50.0)	10 (15.6)	
After 48 hrs	4 (11.1)	9 (14.1)	

Chi-square test is done to measure the level of significance. Figure within parentheses indicates percentage in column.

Table 4: Distribution of study subjects by lipid profile in groups (n=100)

Lipid profile	Group		p-value
	Haemorrhagic stroke (n=36)	Ischaemic stroke(n=64)	
Total cholesterol (TC)	173.47 ± 61.96	178.22 ± 54.79	0.693
HDL	42.94 ± 6.14	43.31 ± 8.65	0.820
LDL	118.80 ± 36.32	125.17 ± 54.45	0.533
Triglycerides (TG)	155.38 ± 73.74	150.71 ± 96.31	0.802

t test is done to measure the level of significance

Maximum (62.0%) study subjects had altered LDL level followed by 54.0%, 33.0% and 25.0% patients had altered TC, altered HDL and altered TG level respectively (Table 5)..

Table 5: Distribution of study subjects by type of altered lipoproteins in stroke patients (n=100)

Lipid profile	Frequency	Percentage
Total cholesterol (TC)	54	54.0
HDL	33	33.0
LDL	62	62.0
Triglycerides (TG)	25	25.0

Discussion

In the present study, maximum (64.0%) study subjects had ischaemic stroke and 36.0% had haemorrhagic stroke. Among 36 haemorrhagic stroke patients, maximum 15 (41.7%) patients were in age group 61-70 followed by 13 (36.1%) in age group 51-60 years. Among 64 ischaemic stroke patients, maximum 19 (29.7%) were in age group 51-60 years followed by 17 (26.6%) in age group 61-70 years. It suggested that stroke is more commonly occurred among older patients than the younger age group which is similar to a previous study where half of all strokes occurred in people over age 75 and one-third in the population over age 85 years⁸.

55.6% patients were male among haemorrhagic stroke patients and 64.1% were male among ischaemic stroke patients. Other studies also found that stroke is more common in men than in women in most age groups which is in agreement with the present result^{9,10}.

Considering their nature of work, maximum patients had sedentary work in among both haemorrhagic (61.1%) and ischaemic (60.9%) stroke patient groups. So high level of physical activity is protective against stroke which is matched with another study¹¹.

Considering presenting complaints, impaired level of consciousness was more common among the haemorrhagic stroke patients (91.7%) than ischaemic stroke patients (57.8%) group and the association was statistically significant

(p=0.001). Limb weakness was the commonest presentation in both haemorrhagic (91.7%) and ischaemic (87.5%) stroke patients. Headache (63.9%), vomiting (69.4%) and vertigo (47.2%) were more common in haemorrhagic stroke patients, but inability to talk/ slurred speech (82.8%) and deviation of mouth (64.1%) were more common in ischaemic stroke patients. The most common symptom of stroke was sudden weakness or numbness of the face, arm or leg, most often on one side of the body¹², which was similar to the present study. Other symptoms include confusion, difficulty speaking or understanding speech; difficulty seeing with one or both eyes; difficulty walking, dizziness, loss of balance or coordination; severe headache with no known cause; fainting or unconsciousness¹². Becker has reported similar result of the present study¹⁰. In another study, the commonest presentation in both ischaemic and haemorrhagic stroke was hemiplegia or hemiparesis which is also similar to this study¹³.

The distribution of patients by lipid profile was recorded. The mean ± SD of total cholesterol (TC) was 173.47 ± 61.96 and 178.22 ± 54.79 in haemorrhagic stroke and ischaemic stroke patients respectively. The mean ± SD of HDL was 42.94 ± 6.14 and 43.31 ± 8.65 in haemorrhagic stroke and ischaemic stroke patients respectively. The mean ± SD of LDL was 118.80 ± 36.32 and 125.17 ± 54.45 in haemorrhagic stroke and ischaemic stroke patients respectively. The mean ± SD of TG was 155.38 ± 73.74 and 150.71 ± 96.31 in haemorrhagic stroke and ischaemic stroke patients respectively. Similarly Shahar et al reported that the relation of circulating cholesterol to ischemic stroke does not resemble its well-known relation to coronary heart disease¹⁴. Either the pathogenesis of a substantial proportion of ischaemic strokes does not involve classic atherosclerotic mechanisms, or the effect of plasma lipids on atherogenesis is substantially different in the intracranial vascular bed.

Maximum (62.0%) study subjects had altered LDL level followed by 54.0%, 33.0% and 25.0% patients had altered TC, altered HDL and altered TG level respectively. Similar

to the present study result, Mendez et al have reported that changes in serum LDL and total cholesterol levels were of major significance in stroke patients than changes in other lipoproteins¹⁵.

Limitations

The study was conducted in a single centre in Barishal city which may not be representative for the whole population. The sample size was small in the present study, which was also a limitation.

Conclusion

In a developing country like Bangladesh, the best policy for combating stroke is primary prevention. Older age, male sex, sedentary work and dyslipidaemia are susceptible to be affected in stroke. Limb weakness is the commonest presentation in both haemorrhagic and ischaemic stroke patients. The greater portion of the total stroke patients was ischaemic, and the smaller portion was haemorrhagic. Among lipoproteins, elevated total cholesterol, triglycerides and LDL showed strong correlation with both ischaemic and haemorrhagic stroke.

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