

## Original Article

# Clinical Presentation and Risk Factors of Stroke-A Study of 100 Hospitalized Stroke Patients in Bangladesh

R Saha<sup>1</sup>, MMSU Islam<sup>2</sup>, AM Hossain<sup>3</sup>, MR Kabir<sup>4</sup>, AA Mamun<sup>5</sup>, SK Saha<sup>6</sup>, SK Mondal<sup>7</sup>, MJ Alam<sup>8</sup>

### Abstract:

Stroke is one of the most common medical emergency. A total number of 100 randomly selected clinically and CT proven acute stroke patients were studied at medicine and neurology ward of Faridpur Medical College Hospital (FMCH), Faridpur from January to July, 2014 with a view to study the clinical features and risk factors of Stroke. Among 100 patients, stroke was found most commonly in 59-70 years age group. Ischaemic stroke was 56%, haemorrhagic stroke was 39% and haemorrhagic infarct was 5%. Most of the patients were male with male-female ratio was 1.6:1. The commonest risk factor was hypertension found in 60%, diabetes mellitus found in 17%, smoking was present in 54% patients and dyslipidaemia was present in 22% cases. History of heart disease (Myocardial infarction was present in 2% patients, valvular heart disease was present in 4% patients) was present in 6% patients. The commonest presentation in both ischaemic and haemorrhagic stroke was hemiplegia (61%). Headache (14%) and vomiting (10%) were found to be more common accompaniment in haemorrhagic stroke. Loss of consciousness was present in 34% patients. Alcohol intake was not found in any patient.

**Key words:** Stroke, Clinical features, Risk factors.

### Introduction:

Stroke is the third most common cause of death in the developed world after Cancer and Ischaemic heart disease and is the most common cause of severe physical disability. Stroke may be defined as episode of

1. Dr. Radheshyam Saha, MBBS, FCPS (Medicine), MD (Neurology), Associate Professor, Department of Neuromedicine, Faridpur Medical College, Faridpur.
2. Dr. M. M. Shahin-Ul-Islam, MBBS, FCPS (Medicine), MD (Gastroenterology), Assistant Professor, Department of Gastroenterology, Faridpur Medical College, Faridpur.
3. Dr. Ahmed Manadir Hossain, MBBS, D-Card, FCPS (Medicine), Assistant Professor, Department of Medicine, Faridpur Medical College, Faridpur.
4. Dr. Mohammad Rafiqul Kabir, MBBS, D-Card, Assistant Registrar, Department of Neuromedicine, Faridpur Medical College Hospital, Faridpur.
5. Dr. Abdullah Al Mamun, MBBS, Assistant Registrar, Department of Medicine, Faridpur Medical College Hospital, Faridpur.
6. Dr. Suranjit Kumar Saha, MBBS, Medical Officer, Department of Medicine, Faridpur Medical College Hospital, Faridpur.
7. Dr. Swapan Kumar Mondal, MBBS, MD (Nephrology), Assistant Professor, Department of Nephrology, Faridpur Medical College, Faridpur.
8. Dr. Md. Jahangir Alam, MBBS, MTM (Transfusion Medicine), Assistant Professor, Department of Transfusion Medicine, Faridpur Medical College, Faridpur.

#### Address of correspondence :

Dr. Radheshyam Saha, MBBS, FCPS (Medicine), MD (Neurology), Associate Professor, Department of Neuromedicine, Faridpur Medical College, Faridpur, E-Mail: drsaha@yahoo.com

sudden focal brain dysfunction of vascular origin (non traumatic, non epileptic) which persists more than 24 hours or the patient dies within this period. Stroke is the most frequent clinical manifestation of disease of the cerebral blood vessels, although cerebrovascular disease may present, particularly in the elderly, as a dementia. Stroke may be focal ischaemia which comprises about 85% and haemorrhagic which about 15%. Ischaemic stroke comprises both thrombotic and embolic stroke. Embolic stroke has definite source of embolization either from heart or from great vessels (carotid artery or vertebral artery etc).

The clinical picture is variable depending on the site and extent of lesions<sup>1</sup>. In developed countries various endeavors are in the way for early diagnosis and appropriate management to reduce the stroke related mortality and morbidity. But the scenario in our country is different. In our study, we have to depend largely on clinical diagnosis. Hypertension and diabetes mellitus are frequent risk factors associated with the development of stroke<sup>2-4</sup>.

### Materials and Methods:

It was a prospective observational study, carried out among hospitalized patients of stroke admitted in medicine and neurology ward of Faridpur Medical College Hospital from January to July 2014. A total 100

patients of stroke, in whom CT scan of brain was done, were included in the study. Patients who fulfilled WHO definition criteria for stroke "Sudden developing focal brain dysfunction (non traumatic, non epileptic) of vascular origin, the neurological deficit persists more than 24 hours or death occurs within this period" were included in the study. Patients dying before recording the information or the patients refusing to give consent to take part in this study were excluded. Data was collected in a predesigned data form and were analyzed & presented accordingly.

**Results:**

Among 100 patients, 62 were male and 38 were female with a male-female ratio was 1.6:1. Age of the study population ranged from 20 to 95 years with a mean age about 59.97±12.12 years. Out of 100 patients ischaemic stroke was 56%, haemorrhagic stroke was 39% and haemorrhagic infarct was 5%. Hypertension, diabetes mellitus, smoking and dyslipidaemia were the frequent risk factors. Hypertension was present in 60% cases, diabetes mellitus was present in 17% cases, smoking in 54% cases, dyslipidaemia in 20% cases, heart disease in 6% cases but no alcoholic patient was found in this study.

Regarding clinical presentation, 61% patients had hemiplegia, 30% had hemiparesis, 15% had dysphasia, 24% had dysarthria, 14% had headache, 10% had vomiting, 34% were unconscious, and 43% had cranial nerve palsy. Impaired higher mental function was found in 29% patients (Table I).

**Table I:** Distribution of patients according to clinical features

Variable	Sub Variable	Number (%)
Hemiplegia		61 (61)
Hemiparesis		30 (30)
Monoplegia		0 (0)
Monoparesis		0 (0)
Paraplegia		0 (0)
Dysphasia		15 (15)
Dysarthria		24 (24)
Headache		14 (14)
Vomiting		10 (10)
Loss of consciousness	Absent	66 (66)
	Present	34 (34)
Cranial nerve palsy		43 (43)

CT scan of brain shows infarcts in 56% cases, haemorrhage in 38% cases, haemorrhagic infarct in 5% cases and sub-arachnoid haemorrhage in only 1% case. Among haemorrhage majority were intracerebral

(62.8%) followed by intracerebral with ventricular extension 30.2 patients. Among infarction majority had infarct in middle cerebral artery territory (68.9%), followed by lacunar infarct (23%) Table II.

**Table II:** Distribution according to CT scan of brain findings

Variable		Number (%)
CT Scan	Infarct	56 (56)
	Haemorrhage	38 (38)
	Both	5 (5)
	SAH	1 (1)
Haemorrhage	Intracerebral	27 (62.8)
	IC+ventricular extension	13 (30.2)
	Cerebellar	1 (2.3)
	Intraventricular	1 (2.3)
	IC + SAH extension	1 (2.3)
Infarction	Lacunar	14 (23)
	MCA	42 (68.9)
	PCA	4 (6.6)
	Brain Stem	1 (1.6)

(IC=Intracerebral, SAH=Sub-arachoid haemorrhage, MCA=Middle cerebral artery, PCA=Posterior cerebral artery)

Different symptoms and risk factors were correlated with types of stroke and it was found that headache & loss of consciousness were positively correlated with haemorrhagic stroke (P<0.05) (Table III).

**Table III:** Correlation of different risk factors & clinical features with type of stroke (N=100)

Parameter		Stroke Type			P value*
		Haemo rrhage	Infar ction	Total	
Sex	Female	17	21	38	0.90
	Male	27	35	62	
Smoking	Absent	20	26	46	0.92
	Present	24	30	54	
History	Absent	30	43	73	0.33
	Present	14	13	27	
Headache	Absent	34	52	86	<b>0.026</b>
	Present	10	4	14	
Vomiting	Absent	37	53	90	0.08
	Present	7	3	10	
Unconscious	Absent	24	42	66	<b>0.032</b>
	Present	20	14	34	
H/O HTN	Absent	15	25	40	0.28
	Present	29	31	60	
H/O DM	Absent	40	43	83	0.06
	Present	4	13	17	
H/O MI	Absent	43	55	98	0.86
	Present	1	1	2	
H/O Vulvular HD	Absent	43	53	96	0.43
	Present	1	3	4	

### Discussion:

In our study, the commonest neurological deficit was found hemiplegia (61%). This result correlates with that of Md. Orfi et al<sup>5</sup> & Siddique et al<sup>6</sup>. Impaired consciousness was found in 66% cases, which correlates with the study of Siddique et al<sup>6</sup>.

Among the risk factors hypertension was present in 60% cases. It correlates with AM Hossain et al<sup>7</sup> (63% cases) and Siddique et al<sup>6</sup> (69% cases). Diabetes mellitus was present in 17% cases. The Copenhagen stroke study has shown that in 1135 acute stroke patients, 233 (20%) were suffering from diabetes mellitus<sup>8</sup> which is similar to our result. This result also correlates with the study of AM Hossain et al<sup>7</sup> (21%) and with MR Siddique et al<sup>9</sup>(11%). This result also correlates with the study in India<sup>10</sup>. Framingham study has shown that 10-14.7% of the stroke patients were diabetic. In BIRDEM study on 165 cases of diabetic patients, all of them developed stroke in less than 10 years duration<sup>11</sup>. History of smoking was present in 54% cases which correlates with many studies<sup>12,13</sup>. Yano et al<sup>14</sup> and Donnan et al<sup>13</sup> found strong association between cigarette smoking and stroke. History of dyslipidaemia was present in 20% cases which was similar with the study of Hayee et al (19.07%)<sup>15</sup> but lower than that of Basher<sup>16</sup>. Raised serum cholesterol is an important risk factor for myocardial infarction but its relationship with stroke was not clear<sup>17</sup>. Higher level of HDL cholesterol is associated with significant decrease risk of stroke<sup>18</sup>. Our study had showed that 6% had heart disease (4% valvular heart disease and 2% ischaemic heart disease). This was much less than that of AM Hossain study<sup>7</sup> and of Hayee study<sup>15</sup>.

Deferent risk factors were recorded and analyzed for their association with stroke. Among the non-modifiable risk factor age and sex were studied. Elderly people were the most vulnerable for developing stroke. Most of the patients were in the 59-70 years age group. Hospital based study done in Dhaka medical college hospital showed that majority of stroke its were above the age of 45 years<sup>19</sup>. A study done by Chowdhury SZM<sup>12</sup> and Arif SM<sup>20</sup> also found peak incidence between 5th to 7th decade. In our study there was a male predominance among stroke patients which is an agreement with other studies including western ones<sup>21,22</sup>. The higher male preponderance in our study may be due to fact that women are neglected part of our society and they are not brought to hospital, if not otherwise seriously ill. The actual ratio may be slightly different with only slight male excess.

### Conclusion:

Stroke is one of the important causes of morbidity, mortality and socio-economic challenge. This is particularly true for Bangladesh. The objective of our study is to find out the important risk factors prevailing in our society and to prevent the stroke by controlling the risk factors. In our study, a number of risk factors were identified, of which hypertension remains the most important one, next were diabetes mellitus, smoking and dyslipidaemia. Targeting these risk factors for preventing stroke will help reducing the burden of

this often disabling disease. In a developing country like ours, the best policy for combating stroke is primary prevention. A much larger scale study must be done in various level of hospital in our country to find out the actual picture.

### References :

1. Clarke CRA. Cerebrovascular disease and stroke. In Kumar P and Clark M eds. Clinical medicine, 6<sup>th</sup> edition. Philadelphia : SAUNDERS. 2005; 1163-1173.
2. Fisher CM: Lacunes : Small, deep cerebral infarct, Neurology 1965 : 15: 774-784.
3. Fisher CM : The arterial lesions underlying lacunes. Acta Neuropathol. 1969;12; 11-15.
4. Fisher CM : Lacunar stroke and infarcts: A review neurology 1982, 32; 871-76.
5. M.D. Orfei, R.G. Robinson, G.P. Prigatano, S. Starkstein, N. Rüsçh,P. Bria, C. Caltagirone, G. Spalletta, Anosognosia for hemiplegia after stroke is a multifaceted phenomenon: a systematic review of the literature. Brain, a journal of neurology. 2007; 3075-3090.
6. MAN Siddique, Z Nur, MS Mahabub, MB Alam, MT Mia, Clinical presentation and epidemiology of stroke - A study of 100 cases. J medical 2009, 10; 86-89.
7. A M Hossain, N U Ahmed, M Rahman, M R Islam, G Sadhya, K Fatema. Analysis of socio-demographic and clinical features associated with hospitalized stroke presents of Bangladesh. FMCI, 2011, 6(1); 19-23.
8. Boysen G, Nyboe J, Applegard M et al. Stroke incidence and risk factors for stroke in Copenhagen, Denmark. Stroke 1988 ; 19: 1343-53.
9. MR Siddique, QT Islam, MJ Iqbal, SS Binte-Mosarraf. Socio-demographic status and associated risk factors of the stroke patients in a tertiary care hospital of Bangladesh. AKMMCJ, 2013, 4(2); 18-22.
10. Dhamija RK, Dhamija SB. Prevalence of stroke in rural community. An overview of Indian experience. PI 1998: 46(4):3514.
11. Latif ZA, Zaman SM, Barua A, Ahad A, Rahim SA. study of stroke between normotensive and hypertensive NIDDM cases in BIRDEM, Dhaka, Bangladesh journal of Neuroscience 1990, 6; 52-9.
12. Chowdhury SZM. Study of risk factors in cerebr ovscular disease. A study of 100 cases (dessertation) BCPS, 1991: 48.
13. Donnan AG. Smoking is a risk factor for cerebral ischaemia. Lancet 1949: 16:6434-7.
14. Yano K, Reed DM, Yin Y, Abbott RD. Risk of stroke in male cigarette smoker. N Engl med 1986 : 315: 717-20.
15. Hayee A, Hayee A, Anowarullah AKM, Haque A, Akhtar N. Analysis of risk factors of stroke in 472 cases. Bangladesh Journal of Neuroscience 1999: 14 (2); 41-54.
16. Basher A. A dissertation on "Study of risk factors of stroke" BCPS : 1995 : P-78-80.
17. Pontre NR, Marmot MG. Primary prevention of stroke. Lancet. 1992: 339; 344-7.
18. Wannamethee SG, Sharpet AG, Ebrahim S. HDL cholesterol, total cholesterol and risk of stroke in middle aged British men. Stroke. 2000 : 31 (8) : 1882-8.
19. Mohammad QD, Alam B, Habib et al. Prevalence of stroke in Bangladeshi population. A population based study. JAFMC. 2009; 5(1): 24-07.
20. Arif SM. Study on risk factors for stroke in Bangladesh (Dissertation). BCPS : 1993; 55.
21. Charles W. Disorders of cerebral circulation. In: Walton Jhon, ed. Barin's Disease of The Nervous system, 10th edition. Oxford: Oxford University Press, 2000:197-265.
22. Agarwal JK, Somani PM, Katiyar BC. A study of risk factors in nonmetabolic cerebrovascular diseases. Neurol India 1976, 24; 125-33.