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Original Article

Analysis of Sociodemographic and Clinical Factors Associated with Hospitalized Stroke Patients of Bangladesh

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Abstract

A hospital based cross sectional study was carried out to analyze prevalence of risk factors for stroke in hospitalized patient in a medical college hospital. 100 patients were chosen using purposive sampling technique. Highest incidence of stroke was between the 6th and 7th decade. Patients came from both urban (54%) and rural (46%) areas and most of them belong to the low-income group (47%). In occupational category; service holder (28%) and retired person (21%) were the highest groups. Most of the study subjects were literate (63%). CT scan study revealed that the incidence of ischaemic stroke was 61% and haemorrhagic stroke 39%. Analysis indicated hypertension as major risk factor for stroke (63%) and major portion of the patients (42.85%) were on irregular or no treatment. Twenty four percent of the patients had heart diseases and out of 24 patients 45.83% were suffering from ischaemic heart disease. The present study detected diabetes in 21% patients. Fifty three percent of the study subjects were smoker, 39% patients had habit of betelnut chewing. Out of 26 female patients, only 23% had history of using oral contraceptives. Majority of the patients were sedentary workers (46%). Thirty seven percent of the stroke patients were obese. Among the stroke patients 9% had previous history of stroke and 3% had TIA respectively. Most of the patients (21%) were awake while they suffered from stroke and the time of occurrence was mostly in the afternoon (46%). This study found that hypertension, cigarette smoking, ischaemic heart disease and diabetes mellitus are the major risk factors prevalent in our community while other risk factors demand further study.

Key words: stroke, risk factors, hospitalized patients, Bangladesh.

Introduction

Stroke is a neurological disease, which is a major cause of death and disability worldwide[1]. WHO defines stroke as rapidly developed clinical signs of focal disturbance of cerebral function lasting for more than 24 hours or leading to death without any apparent cause other than vascular origin[2]. The incidence of stroke increases with age and affect many people in their golden years. It is third most common cause of death in developed countries. The age adjusted annual death rate from stroke is 116 per 100000 population in the USA and some 200 per 100000 in UK[3]. In Bangladesh there is no adequate data on incidence and mortality from stroke. Among stroke, ischaemic infraction constitute 85% to 90% and 15% to 10% is caused by intracranial hemorrhages in the western world, while hemorrhages constitute a larger percentage in Asia[4].

Risk factors for stroke include irreversible or non modifiable factors like age, sex, heart disease and modifiable factors like hypertension, heart disease, diabetes mellitus, hyperlipidaemia, smoking, excess alcohol, polycythaemia and oral contraceptive[4]. The morbidity and mortality from cerebrovascular disease has been diminished in recent years largely due to better recognition and treatment of underlying arterial and cardiac disease including hypertension.

There is no cure in management of stroke. But

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prevention is possible by early detection and reducing the modifiable risk factors for stroke. This is very much important in the concept of our country where medical facilities and resources are limited and most of the people lives below poverty level.

Materials and methods

It was a cross sectional study carried out in 100 patients of stroke admitted in different Medicine Units of Mymensingh Medical College Hospital (MMCH) from July 2001 to June 2003. One hundred patients of stroke presented with diverse clinical features, subsequently proved by CT scan of brain were taken into account.

The initial clinical diagnosis of stroke was made from history obtained from the patient himself or from his/her attendant. Detail clinical examination, thorough general physical examination (specially cardiovascular and neurological examination) was carried out and recorded on a fixed proforma. CT scan of brain was done in every case to confirm the diagnosis. CSF study, ECHO, antinuclear factors were done in selective cases.

Patient who could not give history properly or had no responsible attendant and who had history of head injury, ICSOL or bleeding disorder were excluded from the study. Patients in whom diagnosis was confirmed by CT scan were requested to participate in the study. After having informed verbal consent 100 sample were recruited. After collection of the data in a standardized proforma all the data were analyzed and presented in simple statistical percentage.

Results

Most of the patients suffering from stroke were male (74%) and most of them were between 51-70 years of age (69%). Majority were from urban area (54%). Most of the patients were service holders (28%) which were followed by retired group (21%). Average monthly income of the majority of the family was less than TK 5000. (Table-I)

Majority of the patients suffered from ischemic stroke (61%). Time of occurrence was mostly in the afternoon (46%). (Table-I1)

Table I. Socio-demographic characteristics of the respondents (n=100)

Characteristics		No. of respondents	Percentage
Sex	Male	74	74.0
	Female	26	26.0
Age (in years)	≤ 40	6	6.0
	41 -50	14	14.0
	51 -60	39	39.0
	61 -70	30	30.0
	> 70	11	11.0
Residence	Urban	54	54.0
	Rural	46	46.0
Main occupation	Service holder	28	28.0
	Businessman	17	17.0
	Housewife	16	16.0
	Retired	21	21.0
	Agriculture	9	9.0
	Others	9	9.0
Average monthly family income (in taka)	<5000	47	47.0
	5000 - 10000	39	39.0
	>10000	14	14.0

Table II. Clinical characteristics of the stroke patients (n=100)

Characteristics			No. of respondents	Percentage
Pattern of lesion in CT scan	Infarction		61	61.0
		Non embolic	56	56.0
		Embolic	5	5.0
	Hemorrhagic		39	39.0
		ICH	35	35.0
		Cerebel lar	1	1.0
		SAH	3	3.0
Time of occurrence	Morning		13	13.0
	Noon		23	23.0
	Afternoon		46	46.0
	Night		18	18.0

ICH = Intra-cranial hemorrhage; SAH = Sub-arachnoid hemorrhage

Table III: Factors associated with stroke

	Characteristics	No. of respondents	Percentage
Hypertension		63	63.00
	Regularly treated	15	23.80
	Irregular/no treatment	17	42.85
	Diagnosed on admission	21	33.33
Smoking		53	53.00
	<20 sticks per day	37	69.81
	>20 sticks per day	11	20.75
	Stopped smoking for at least one year	5	9.44
Heart diseases		24	24.00
	Myocardial Infarction	4	16.66
	Ischaemic heart diseases	11	45.83
	Valvular heart diseases	6	25.00
	Non valvular AF	3	12.50
Diabetes mellitus		21	21.00
Hyperlipidemia		7	7.00

Discussion

Frequency of stroke rises exponentially with increasing age[5]. Majority of the study subject (94%) were above the age of 40 years and the peak incidence was between 51 to 70 years (69%). A study by Bashar et al found that the highest age of incidence of stroke was between 6th to 7th decades[6], which coincided with the study of Chowdhury[7] and Arif et al[8]. This contradicted with the study by Aho et al where the peak incidence was at or above the age of 85 years[9]. This discrepancy with the present time is that a small portion of the population of our country survives upto that age.

In this study, 74% were male and 26% were female and ratio was 2.8:1 which coincide with that of Chowdhury et al[10]. The present study defers with a previous study of Alamgir et al[11] which showed male: female ratio was 4:1 .

The present study showed that the study subjects were from both urban and rural areas with slight urban dominance (54%). This indicated that incidence of stroke is common both in urban and rural population which was contradicted by the study of Bashar et al which showed mainly urban preponderance[6]. The reason might be that, the study was done in the hospitals of Dhaka, where mostly the urban population could avail the hospital facilities due to economic condition. The present study was conducted in MMCH, which covers a wide range area of mainly rural area of Mymensingh district.

Considering socio-economic status, the low-income group (monthly income TK <5000) comprised the majority (47%) This result correlated with the study by Hart-CL et al[12] which concluded that poor socio-economic circumstances was associated with greater risk of stroke, which was also found in other studies[13,14]. But this study disagreed with the study of Chapman et al which showed the incidence of stroke was high among the high-income group[15].

In this study, literate group comprised of 63%. Of the literate Group, 31% patients received schooling, 19% patients received college education and only 13% went to university or similar institution. Hart et al had shown that men, who left full time education at the age of 16 years or below, had significant higher rate of stroke[12]. But these studies contradicted with that of Ross et al whose study revealed education level was inversely associated with fatal stroke[16]. In occupational category, businessman (17%) in male population and house wife (16%) in female population were affected by this disease. This study showed that among the affect persons 79% were working force of our society, which indicates a serious impact on the families of the sufferers.

CT finding of the studied patient showed that 61% had ischaemic stroke while 39% had haemorrhagic stroke. This finding was almost similar with the study of Alam et al done in Dhaka Medical College Hospital (DMCH)[17]. But this study contradicted with the study of Hayee et al[18] which was also done in Dhaka where the incidence of ischaemic stroke was higher (83.89%). Higher rate of haemorrhagic stroke is also have been reported in number of hospitals in Asian countries such as Singapore, Malaysia (33%) Thailand (30%), Korea (31%), Taiwan (31%)[19,20]. One of the cause of high incidence of haemorrhagic stroke in this hospital based present study may be due to the acute admission is more related to haemorrhagic stroke.

The present study showed that 63% of the stroke patients were suffering from hypertension. Hayee et al found that 52.11% were hypertensive[18], which was 58% by Alamgir et al[11]. A study among diabetic patients with stroke, found that 50.3% of them were hypertensive[21]. Similar studies in some Asian countries also correlated with the present study[19,20]. Out of 63 hypertensive patients 33.33% did not know that they were hypertensive, 42.85% were on irregular or no treatment. A study by Alamgir et al of stroke patients who were hypertensive, found that 80.7% of the stroke

patients were not aware that they were hypertensive[11], which was quite higher than the present study. Increase awareness about hypertension may be the cause of decrease rate of newly diagnosed cases. Present study finding was almost similar to the study of Chowdhury et al[10]. The high percentage of irregularly treated patients in all the studies seems to be due to lack of adequate knowledge or motivation for continuous treatment of hypertension.

In this study 24 cases had heart diseases. Similar study by Hayee et al found that 29.66% of the patients were suffering from different heart diseases[18]. In the present study out of 24 heart disease patients, 16.66% had myocardial infarction, 45.83% had ischaemic heart disease, 25% had valvular heart disease and 12.5 % had non-valvular atrial fibrillation. Ischaemic heart disease definitely augments the risk of stroke[22-24]. A study in Britain found that men with definite evidence of previous myocardial infarction had four fold higher risk of stroke compared to men with no pre existing IHD[22]. Budlie revealed that 24% of the stroke patient had evidence of recurrent myocardial infarction[25]. Anderson found that non-valvular atrial fibrillation is responsible for about half of the cases of cardio embolic stroke[26].

Present study showed that 21% of the stroke patients were diabetic which was similar with the study in India[27]. Framingham study has shown that 10-14.7% of the stroke patients were Diabetic. In BIRDEM a study on 165 cases of diabetic patients, all of them developed stroke in less than 10 years duration[21]. We found that 13% of the stroke patients were suffering from both hypertension and diabetes mellitus. It is difficult to assess which of the risk factors has predominant role on stroke. But when all these risk factors are present, the relative risk of suffering from stroke is greater[17].

In this study 12% of the patients had raised serum cholesterol, which was similar with the findings of Bashar[6] but lower than Hayee et al (19.07%)[18]. Raised serum cholesterol is an important risk factor for myocardial infarction, but its relationship with stroke was not clear[28]. Higher level of HDL cholesterol is associated with significant decrease risk of stroke[29]. This study showed that 53.53% of the patients were smoker. Yano at el[30] and Donnan et al[31] found strong association between cigarette smoking and stroke.

Few studies have been done on time variation of stroke. In our study, in 46% cases the episode initiated in the afternoon, and 23% in the noon; while the incidence of stroke was minimum in the morning (13%). Marshall found that stroke was more likely to occur during night[32], whereas Agnoli et al suggested the opposite[33].

Conclusion

Stroke is one of the foremost causes of morbidity, mortality and a socioeconomic challenge. This is particularly true for developing countries like Bangladesh, where health support system including the rehabilitation system is not within the reach of ordinary people. It is crystal clear that, this devastating condition not only affects the patient but also their family. The objective of this hospital-based study was to identify the important risk factors for stroke prevalent in our society both among the urban and rural population. This study may have not reflected the exact situation but gives an utmost picture of the disease. There are many risk factors for stroke, some are modifiable and some are not. In this study a number of modifiable risk factors were identified, of which hypertension remains the most important factor. Next were smoking, diabetes mellitus and ischaemic heart disease. Stroke is more preventable than to cure. In an under developing country like ours the best policy for combating stroke is primary prevention. This study reveals that the major risk factor hypertension needs maximum attention for the prevention of stroke. By controlling hypertension we can significantly reduce the incidence of stroke. For this we need increase awareness among people regarding hypertension and its complication.

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