

Study On Stroke In Young Patient Due To Cardiac Disease in Tertiary Care Hospital in Dhaka City

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Abstract

Objectives: Study of the risk factors associated with stroke due to cardiac disease in age group between 18 to 45 years of age, evaluate the risk factor of hospitalized stroke patients & to search for cardiac disease associated with stroke also appropriate preventive measure applicable for our country.

Materials & Methods: Non randomized prospective observational study was carried out in the department of Neurology, Medicine & Cardiology unit of Dhaka Medical College Hospital between the periods of July 2009 to December 2009. Fifty (50) consecutive indoor patients more than 18 years of both sex admitted with suspicion of stroke. Diagnosis of stroke will be made from details clinical history clinical examination and confirmed by CT scan or MRI.

Result: Fifty patients were randomly chosen for this study, of which 26 (52%) patients were male, 24 (48%) patients were female & male:female ratio was 1.08:1. Highest incidence of stroke was in between 3rd & 4th decade. The incidence of ischemic stroke 46 (92%) & hemorrhagic stroke 4(8%). Cardio embolism is the major (92%) risk factor for ischemic stroke. Among the cardiac risk factors, valvular disease (64%), MI (16%), & IHD (10%), Atrial fibrillation 8%, Patent foramen ovale 2%. Among the patients 33.33% of women with cerebral infarction were using OCP. Majority of the patients in this study were sedentary worker (45%). Among the stroke patients 8% & 10% had previous H/O stroke & TIA respectively.

Conclusion: In this study a number of modifiable risk factors were identified, of which valvular heart disease & HTN are important risk factor next are DM & IHD smoking. Most of the valvular heart diseases are rheumatic in origin, which can be prevented through primary & secondary prevention of rheumatic fever.

Key words: Stroke, Cardiac disease, Tertiary level hospital, Young patient

Introduction

Stroke is a clinical syndrome consisting of a constellation of neurological findings. Sudden or rapid in onset which persists for more than 24 hours & whose vascular origins are limited to thrombotic or embolic occlusion of a cerebral artery resulting in infarction or spontaneous rupture of a vessel resulting in intracerebral or subarachnoid hemorrhage. Stroke in young adults may be devastating & frequently no cause can be found. Though there are some overlapping in the risk factors between the some clearly distinct risk factors for ischemic & hemorrhagic stroke in young adults, e.g. oral contraceptive pill, pregnancy, postpartum state, connective

tissue diseases with vacuities, hematological variables, drug abuse, smoking, congenital heart diseases, family history, some genetic diseases etc. In terms of causation stroke in young adults is remarkably heterogeneous. Western reports^{1,2,3} show that in young age group, cardiac embolization & non-atherosclerotic vasculopathies are rarely important cause of ischemic stroke as compared to atherosclerotic vasculopathy & small artery occlusion. Stroke type in the young may influence the outcome & may have a dramatic impact on the quality of life in survivors⁴. Diagnostic approach to stroke in young adults differs from that for older patients. A thorough investigation is recommended looking

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into a broad array of potentials etiologies especially cardiovascular events. Cardioembolic sources are often occult so when the cause of ischemic stroke in young person is unclear after a thorough initial diagnostic evaluation, it is worthwhile to take a second look to the heart. The incident of stroke in Bangladesh is not known, it is about 10% of all emergency of stroke in medical words. However, prognosis of ischemic stroke to young adults is reported as favorable despite of its relationship with the presence of severity of complication at the time of the first event & transient ischemic attack (TIA) are an important determinant of stroke, with 90 days risk of stroke reported as high as 10.5% & the stroke risk apparent in first week. So the writing of the article aims at dissemination & making alert doctors of all level for preventive measure & early diagnosis & therapeutic intervention due to cardiovascular diseases.

Materials & Method

This is a non randomized prospective observational study was carried out in the department of Neurology, Medicine & Cardiology unit of Dhaka Medical College Hospital between the period of July 2009 to December 2009. Fifty (50) consecutive patients 18 -45 years of age both sex admitted in Dhaka Medical College Hospital suspicion of stroke was included in the study. All routine investigation were done including TC, DC, ESR, Hb%, total platelet count Urine for R/M/E, S. Creatinine, FBS& 2HABF,CXR P/A view,ECG, Fasting Lipid profile, Anti Phospholipids antibody, Protein C & S confirmed by CT scan or MRI of brain & evaluation of cause due to cardiac diseases through appropriate relevant investigation like Echocardiography (Color Doppler/Trans esophageal). History of head injury, ICSOL, any demyelinating disease, bleeding disorder evident by history or by brain imaging & Patients who die immediate after admission were excluded from the study. All the data were analyzed and presented by simple statistical percentage and tabulated form by SPSSsystem. Informed consent was taken from the patient or from the attendant of the patient for participation in the study. Patients were followed up during their stay in the hospital to observe the outcome. Ethical Clearance was taken from local medical ethical committee of Dhaka Medical College Hospital.

Result

Stroke incidence rises exponentially with increasing age. In this present study, all the patients were grouped in five age groups. Majority of the study subjects were above 41 years of age

Table-I
Demographic variation of stroke

Variable	Frequency (%)
Age distribution	
18-23	2(4%)
24-29	9(18%)
30-35	10(20%)
36-40	11(22%)
41-45	18(36%)
Sex distribution	
Male	26(52%)
Female	24(48%)
Occupation	
Cultivator	3(6%)
Day labour	4(8%)
Student	4(16%)
Unemployed	8(16%)
Businessman	4(8%)
House wife	14(28%)
Service	6(12%)
Others	3(6%)
Smoking habit	
Nonsmoker	10(20%)
Smoker	40(80%)
Distribution of patients according residence	
Urban	28 (56%)
Rural	22 (44%)

Table-1 shows that only 4% occurred in <20 years & 36% in 41-45 years. In this study 52% were male & 48% were female i.e. male incidence is 8% higher than female & ratio is 1.08:1. In occupational category, service holder 12%, businessman 8%, housewife 28%, student 16%, laborer 8%, unemployed 16%. This study indicates that, those who were hard worker were affected less. The present study shows 20% patients were non smoker& 80% were recurrent smoker, incidence of stroke was more among smoker. The study shows that patients came from both urban (56%) & rural (44%) were suffering from stroke. Urban population was more vulnerable. The study shows that the stroke incidence high in low income group (64%) then middle income group (32%).

Table-II

Variable	Frequency (%)
State of patient during onset	8(16%)
Sleep	8(16 %)
Work	1(2%)
Excitement	28(56%)
Rest	5(10%)
Others	4(8%)
Previous History	5(10%)
Stroke	41(82%)
Stroke with Hypertension(n-40)	
Previously Known	16(66.67%)
Regularly treated	6(25%)
Irregular/no treatment	10(41.67%)
Diagnosed on Admission	8(33.33%)
Family History(n-50)	
Diabetes mellitus	8(16%)
Hypertension	10(20%)
Ischemic heart disease	6(12%)
Stroke	16(32%)
No History	10(20%)

Table-II shows that majority of the stroke occurs at rest (56%). The study shows 8% of the patient had previous history of stroke. 10% of the patient had previous history of TIA. In the observed patients regarding previous 20% of the were ex smoker, 8% of the patients had the habit of betel nut chewing, Only 2% had H/O alcohol consumption. Study shows majority 58.33% of the stroke suffered female patients never used oral contraceptive in their life time. 33.33% was regularly taking oral contraceptive. That among the hypertensive patient only 25% were regularly treated, 41.67% were on irregular or no treatment. A good number of patient 33.33% was diagnosed as hypertensive patient for the first time after hospital admission. The study regarding family history shows that about 32% of patient has history of stroke, 20% hypertension, 16% Diabetes mellitus, 12% Ischemic heart disease.

Table-III

Variable	Frequency (%)
Frequency of different heart diseases	8(16%)
a) Myocardial infarction	
Anterior	6
Inferior	2
b) Ischemic heart diseases	5(10%)
Anterior ischemia	1
Inferior ischemia	4
c) valvular heart disease	32(64%)
Mitral stenosis with mitral regurgitation (MS with MR)	7(14%)
Mitral stenosis (MS)	24(48%)
Mitral stenosis with Aortic stenosis (MS with AS)	1(2%)
d) Atrial fibrillation	4(8%)
e) Patent foramen ovale	1(2%)
CT Scan findings (n-50)	
Ischemic	46(92%)
Intracerebral Haemorrhage (ICH)	4(8%)
Outcome of stroke patients during discharge (n-50) (According to Barthel Index)	
Improved	38(76%)
Static	8(16%)
Deteriorated	4(8%)

In this study cardiogenic cerebral embolus is one of the most common causes of ischemic stroke in the young due to cardiac disease accounting for unto 92 % of cases. Among the cardio embolic cause, the mitral valvular disease is the most common. In this study transthoracic echocardiography was done in fifty patients & transoesophageal echocardiography was done in six patients. There was only one patent foramen ovale, detected by doing transoesophageal echocardiography which was missed by transthoracic echocardiography. Most of the patients with valvular heart disease had H/O Rheumatic Fever. Mitral valvular heart diseases were more prevalent in this study group. Among them most of the patients were female. 19 patient had left atrial mural thrombus with vegetation, 8% had atrial fibrillation & Left anterior ventricular wall & inferior wall was found hypo kinetic in 1 & 4 patients respectively. CT & MRI findings of the studied patients show

that 92% had ischemic stroke while 8% had hemorrhagic stroke due cardiac disease. According to Barthel Index during discharge 76% of the patient was improved, 16% were static & the remaining 8% were deteriorated.

Discussion

This study was observational retrospective hospital based & was carried out to determine the risk factors for stroke in young adults (18-45 years) in hospitalized patient in tertiary care hospital of Dhaka city during the period from July 2009 to December 2009. Risk factors for stroke among these patients were identified & correlated. Stroke incidence rises exponentially with increasing age.⁷ In this study, all the patients were grouped in five age groups. Majority of the study subjects were above 41 years of age. Bevan et al⁸ in his study of stroke in young adults also found similar picture Bell et al (1990) studied 50 patients with stroke. Most of the incidence of stroke was between the ages of 50-69 years. In this study (table-1) 52% were male & 48% were female i.e. male incidence is 8% higher than female & ratio is 1.08:1 which coincides with international study. The present study coincides with study of Chowdhury et al¹⁰ & is slightly higher than the finding of Kurtzke¹¹ where showed that frequency of stroke is 30% higher in men than women. CT & MRI findings of the studied patients show (table-3) that 92% had ischemic stroke while 8% had hemorrhagic stroke. This study similar with study of Alam B et al,¹² they studied 1020 patients of stroke in DMCH. In their study the incidence of ischemic stroke was 93% & hemorrhagic stroke was 7%. Higher rate of hemorrhagic stroke also have been reported in number of hospital series in Asian countries such as Singapore, Malaysia (33%), Thailand (30%), Korea (31%), Taiwan (31 %). Higher rate of hemorrhagic stroke in this present hospital based study may be due to the acute admission is more related to the hemorrhagic stroke.

In this study cardiogenic cerebral embolus is one of the most common causes of ischemic stroke in the young due to cardiac disease accounting for unto 92 % of cases. Among the cardio embolic cause, the mitral valvular disease is the most common. In this study transthoracic echocardiography was done in fifty patients & transoesophageal echocardiography was done in six patients. There was only one patent foramen ovale, detected by doing transoesophageal echocardiography which was missed by transthoracic echocardiography. There might be more patent foramen ovals, if TEE could be done in the young adults group, whose risk factor was not identified. Most of the patients with valvular heart disease had H/O Rheumatic Fever. Mitral valvular heart diseases were more prevalent in this study group. Among them most of the patients were

female. Bevan et al¹⁴ shows that about 35.4% cerebral infarcts are due to cardioembolic source. Among 24 mitral valvular heart diseases, 19 patient had left atrial mural thrombus with vegetation & only 4 patient had atrial fibrillation most likely due to rheumatic valvular heart disease. In this study there were cardiac risk factors, other than valvular heart disease. Anterior ventricular wall & inferior wall was found hypokinetic in 1 & 4 patients respectively on transthoracic echocardiography. Among them 16% patients had H/O MI & 10% patients had IHD. This study shows that coronary artery disease in earlier age is also a risk factor ischemic stroke.

Present study shows that 16.67% of stroke patients were suffering from HTN. Bevan et al¹⁴ in "Stroke in young adults" showed that 31% of the patient with cerebral infarction had HTN. This present study correlates with this western study. This study shows that 33.33% stroke patients did not aware that they were hypertensive & 25% were on irregular treatment. This present study is almost similar with the study of Chowdhury et al,¹⁰ who studied 74 hypertensive patients who suffered stroke & had shown that 34% of the patients were not aware that they were hypertensive & 60.7% were on irregular treatment. You canary et al¹⁵ showed in his study that the percentage of ischemic stroke was similar with normal tensile patients but the incidence was higher in untreated cases of HTN. So elective control of HTN is essential. The present study shows 20% patients were smoker. Multiple individual studies have demonstrated that the risk of stroke is increased among the cigarette smokers. Yano et al & Donanet al¹⁶ have shown strong association between cigarette smoking & stroke. Similar study in Copenhagen & Finland¹⁹ has shown increase risk of stroke in smoker. It has been reported by New Zealand researcher 208 that passive smoking significantly increases the risk of stroke among the nonsmoker & in long term ex-smoker. An analysis from 32 studies,¹⁷ found that relative risk of ischemic stroke for smoker were 1.9 times more hand that of non-smoker. In this study out of 24 female patients, 58.33% patient had no H/O taking OCP, 33.33% of patient was currently taking OCP. In this series 33.33% of the women with cerebral infarction were using OCP when their stroke occurred, only 8.33% had strokes attributable solely to OCP. It must be remembered that pregnancy increases the risk of ischemic events by approximately 13 times. Four women among our young patients experienced strokes (2 hemorrhagic, 2 ischemic) during the period of pregnancy & pure premium. Physical activity has inverse relationship with the stroke. Exercise is effective in the prevention of cardiovascular disease & stroke. The benefits are largely manifested through the role that exercise plays an important

role in control of certain modifiable risk factors such as blood lipid abnormalities, diabetes & obesity. This study shows that 20 % of the study subjects were heavy workers, 35% were moderate workers, 45% sedentary workers. This study indicates that, those who were hard worker were affected less. Herman et al¹⁷ suggested that physical activity reduces the risk of stroke. In this present study sedentary workers form the major percentage of stroke. The present study shows, only 8% patients had previous H/O of stroke & only 10% had previous H/O TIA. An western study shows that 18% (Aho et al) & 26% (walker et al¹) patients suffered acute stroke had past H/O one or more episode of stroke which is higher than this present study. In this study, only 16% of the patients were in sleep, 56% were resting state during attack & the rest of the patients were awake. It suggested acute mental stress is either a precipitant of stroke or an important underlying cause. Hayeet al¹³ found in his study that 61% of his study subjects were suffered from acute stressful events before the attack of stroke.

Finally out of 50 patients, the conditions of 38 patients were improved, 8 patients were static & 4 patients were deteriorated.

Conclusion

Stroke is one of the foremost causes of morbidity, mortality & a socioeconomic challenge, more so in Bangladesh where health system including the rehabilitation 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. There are many risk factors for stroke, some are modifiable & some are not. In this study a number of modifiable risk factors were identified, of which valvular heart disease & HTN are important risk factor next is DM, IHD, smoking. Stroke is more preventable than to cure. In an under developed country like ours, the best policy for combating stroke is primary prevention. Most of the valvular heart diseases are rheumatic in origin, which can be prevented through primary & secondary prevention of rheumatic fever. Extensive investigations are necessary to find out etiology of young adults other than cardiac diseases & aggressive treatment & secondary prevention as well as rehabilitation should be considered.

Conflict of Interest : None

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