

PREVALENCE OF RISK FACTORS OF CEREBROVASCULAR DISEASES IN HOSPITALIZED PATIENTS

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Abstract

Background: Stroke is one of the foremost causes of morbidity and mortality in Bangladesh. It has diverse risk factors. The present study is aimed to observe the common risk factors of stroke in our perspective. **Materials and methods:** This observational study was conducted for a 1 year period (April 2010 to March 2011) on 100 patients of stroke admitted in different medicine units of Chittagong Medical College Hospital. Different risk factors were identified along with clinical features after diagnosis of stroke of 100 patients. After collection, data were analyzed and presented to find out demographic pattern, clinical presentation and association with different irreversible and modifiable risk factors. **Results:** Among the 100 patients of stroke age distribution revealed most of the stroke patients were age group 51-60 years (58%) next to which was 61-70 years (22%). Male was 68 (68%) and female 32 (32%). Male to female ratio was 2.1:1. Among the all study patients most were doing business (22%) and engaged in service (20%). Majority of women were housewife (28%). Regarding type of stroke, 82 (82%) cases were ischemic and 18 (18%)

were hemorrhagic type of stroke. Regarding analysis of risk factor of stroke hypertension (62%) was found to be the most common risk factor. Next to which was smoking (54%) followed by DM (28%) and heart disease (24%). **Conclusion:** From the above findings we can conclude that Hypertension, Cigarette smoking, Diabetes mellitus and Ischemic heart disease are the major risk factor of stroke in our setting.

Key words

Stroke; Risk factors; Prevalence.

Introduction

Stroke is the third most common cause of death in the developed world after ischemic heart disease and cancer, responsible for a larger proportion of physical disability¹. Annual death rate from stroke is 116 per 1,00,000 population in USA and about 200 per 1,00,000 in the UK². In Bangladesh the incidence of admission of stroke patients in different hospital is also high. Several factors are known to increase the liability to stroke. The most important of these are hypertension, heart disease, atrial fibrillation, DM, cigarette smoking of long duration and hyperlipidemia. Others such as systemic disease associated with a hypercoagulable state and the use of birth control pills also contribute but to a lesser degree. Hypertension is most readily recognized factor in the genesis of primary intracerebral hemorrhage. Furthermore, it appears that the stroke producing potential of hypertension is as much the product of heightened systolic pressure as of diastolic pressure³.

Keeping all the factors in mind, effort has been made in the present hospital based prospective observational study to detect the risk factors for these diseases in our community. A hospital based study of patients is prone to selection bias as those with serious and unusual types of cerebrovascular diseases are more likely to be admitted into hospitals. With these limitations this study was

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designed to find out the risk factors for stroke, which may help us to take appropriate preventive measures so that at least some people may be rescued from this catastrophic disease.

Materials and methods

It is a prospective observational study carried out among 100 patients of stroke admitted in different medicine units of Chittagong Medical College Hospital from April 2010 to March 2011. Patients presented with diverse clinical features and subsequently proved by CT scan of brain were taken into account. After enrollment, detailed clinical, thorough general physical examination (Especially cardiovascular and neurological examination) was carried out and recorded on a fixed proforma. Routine investigations like TC, DC, ESR, Hb%, Urine R/E, Blood sugar, Fasting lipid profile, Serum electrolytes, Blood urea and Serum creatinine, CXR, ECG were routinely done. CT scan of brain were done in every case to confirm the diagnosis. Echocardiography, Doppler ultrasound of carotid artery, VDRL, RA factor, ANA test and CSF study were done in selected cases. Patients who could not give history properly or no responsible attendant was found, and patients with head injury, ICSOL or bleeding disorder were excluded from the study. After collection of all data those were analyzed and presented to find out demographic pattern, clinical presentation and association with different irreversible and modifiable risk factors.

Results

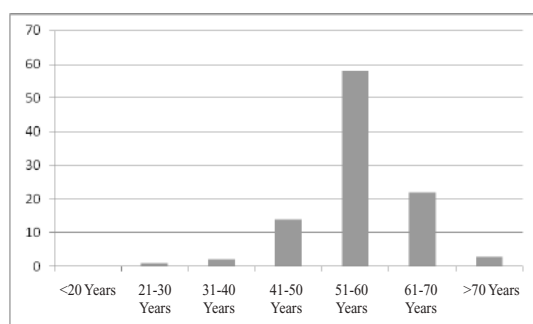


Fig 1 : Age distribution of the study patients

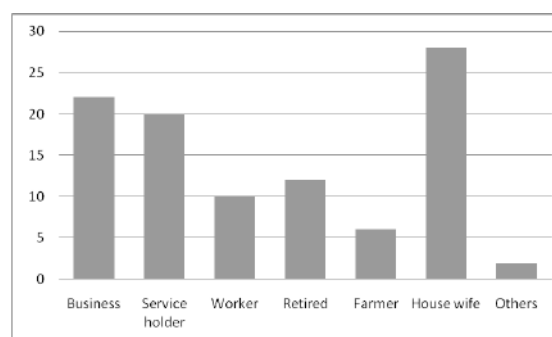


Fig 2 : Occupation of the study patients

Table I : Risk factors of stroke

Risk factors	Number of patients	Percentages
Hypertension	62	62%
Smoking	54	54%
Diabetes mellitus	28	28%
Heart disease	24	24%
Hyperlipidemia	7	7%
Alcohol intake	1	1%
OCP use	8	8%
Past history of CVD	10	10%
H/O TIA	6	6%
Collagen disease	1	1%
Total	100	100%

Among 100 Stroke patients, male constituted 68 (68%) and female was 32 (32%) with male to female ratio of 2.1:1. Age distribution of patients showed that 58% patients were in the age group of 51-60 years, followed by 22% from the age group of 61-70 years (Fig 1). Among all the study patients most were engaged in business (22%) followed by service holder (20%). Majority of women were housewife (28%) (Fig 2). Out of 100 stroke patients, 82(82%) had Ischemic stroke and 18(18%) had Haemorrhagic type of stroke. Regarding analysis of risk factor of stroke, Hypertension was found to be the most common risk factor (62%) next to which was Smoking (54%) followed by Diabetes mellitus (28%) and Heart disease (24%) (Table I).

Discussion

Present study was conducted to determine the risk factors for stroke in hospitalized patients in Chittagong Medical College Hospital (CMCH). In this observational study a total of 100 cases of

stroke patients were selected from different Medicine Units of CMCH during the period of April 2010 to March 2011. Patients were diagnosed clinically as stroke and evaluated by investigations. After collecting the baseline parameters risk factors were identified. In the present study regarding age distribution of the study patients most of the stroke patients were at age group 51-60 years (58%) next to which was 61-70 years (22%). Here majority of study subjects were above the age of 40 years (97%). Bell et al studied 50 cases with stroke where the incidence was between the age 50-60 years and in Bangladesh Chowdhury et al also found the same age group distribution^{4,5}. Out of three patients below age of 40 years, two were due to Rheumatic heart disease and one patient was due to Congenital heart disease.

Regarding sex distribution male was 68 (68%) and female was 32 (32%). Male to female ratio was 2.1:1. Men suffer more than women from stroke and it affects male 1.5 times more than female⁶. This male to female ratio of present study coincides with the previous study done by Chowdhury et al but slightly higher than that of Kurtzke et al where the frequency of stroke were 30% higher in men than women^{7,8}.

Among the all study patients most were doing business (22%) and engaged in service (20%). Majority of women were housewife (28%) and retired persons were 12%. In this study 88% population were in the working group which indicate a serious impact on the families and also an extra burden on national economy. In industrialized countries retired persons are mostly affected⁹. It is good to observe in our study that farmers and industrial workers are less affected in comparison to other professional groups indicating high level of physical activity is protective against stroke¹⁰.

Among all study patients 82 (82%) cases were ischemic and 18 (18%) were hemorrhagic type of stroke. It is similar to that of Hayee et al (83.89%) Jammojik et al (77.34%) and Hossain et al (68%)¹¹⁻¹³. But the incidence of hemorrhagic stroke is higher in the study done by Alam et al (42.16%)¹⁴. Higher incidence of hemorrhagic stroke has also been reported in different hospitals of Asian countries like Singapore (32%) Malaysia (33%) Thailand (30%) Korea (31%) and Taiwan (31%)^{15,16}. It probably reflects the high incidence of acute admission is more related to hemorrhagic stroke.

Regarding analysis of risk factor of stroke hypertension (62%) was found to be the most common risk factor. Next to which was smoking (54%) followed by DM (28%) and heart disease (24%). Hayee et al found among his study patients 52.11% were hypertensive¹¹. Mannan and Alamgir also found in their study that 58% of stroke patients were hypertensive¹⁷. Smoking was found the second big risk factor for stroke. Multiple individual study demonstrated that the risk of stroke increased among cigarette smokers. Yano et al and Donnan et al have shown strong association between cigarette smoking and stroke^{18,19}. Similar study in Copenhagen and Finland has shown increase risk of stroke among the smokers^{20,21}.

In the present study DM was found to be an important risk factor for the stroke in our setting. This study is quite keeping with the study conducted in Dutch community which showed 29% of stroke patients were diabetic²². Here 24% patients were associated with different types of heart diseases. In our country, similar study done by Hayee et al on 427 stroke patients found 29.66% were suffering from different heart diseases¹¹. So, ischaemic heart disease definitely augments the risk of stroke⁶. Use of OCP is also an important risk factor of stroke found in our study which also correlated with previous study²³.

Limitation

Limitation of this study is that, it is a single centre small study which does not reflect prevalence in our general population.

Conclusion

From the findings of the study, it can be concluded that Hypertension, Cigarette smoking, DM and Ischemic heart disease are the major risk factors for stroke in our setting along with some other minor risk factors. So, controlling Hypertension, avoiding smoking and good control of DM can significantly reduce the incidence of stroke.

Disclosure

All the authors declared no competing interest.

References

1. Allen CMC, Lueck CJ, Dennis M. Cerebrovascular disease. In: Haslett C, Chilvers ER, Hunter JAA, Boon NA. Davidson's Principles and Practice of Medicine. 20th ed. Edinburgh, London. 2006;1200-1211.
2. Clarke CRA. Cerebrovascular disease and Stroke. In: Parveen Kumar and Michael Clark, Eds. Clinical Medicine, 6th edition, London, WB Saunders. 2005;1209-1219.

3. Rabkin SW, Mathewson FAL. Long term changes in blood pressure and risk of cerebrovascular disease . *Stroke*. 1978;9:319-323.
4. Bell DA, William B, Vladimar H, Keefe BO. Antiphospholipid syndrome: Prevalence among patients with stroke and HA. *Am J Med*. 1990;88:593-597.
5. Chowdhury SMZ. A dissertation on study of risk factors in cerebrovascular disease: A study of 100 cases. 1991;48.
6. Epidemiology of stroke. In: Thompson SBN and Morgan. Occupational therapy for stroke rehabilitation, 1st edition Chapman and Hall, London. 1990;1-14.
7. Chowdhury SGM, Ahmed Q, Dhan FD, Alam MR, Arif SM, Roy PK. Stroke in patients having inadequate or irregular antihypertensive therapy. *Bang Med Res Coun Bull*. 1990;XV1: 20-53.
8. Kurzke JF. Epidemiology of cerebrovascular disease. In: Cerebrovascular survey report for joint council subcommittee on cerebrovascular disease. National institute of neurological disease and communicative disorders and stroke and national heart and lung institute (Revised). Rochester, Whiting press. 1980; 135-176.
9. Botania R, Beagleore R, North JDK. Events, incidence and case fatality rates of cerebrovascular disease in Auckland, New Zealand. *Am J Epidemiology*. 1984;120:236-243.
10. Kiely DK, Wolf PA, Cuples LA, Seiser AS, Kannel WB. Physical activity and stroke risk. *Am J Epideol* 1994;140:608-620.
11. Hayee A, Haque A, Anwarullah AKM, Akter N. Analysis of risk factors of stroke in 472 cases. *Bangladesh Journal of Neuroscience*. 1998;14(2):41-54.
12. Jammolik K, Broadhurst RS, Anderson CS, Stewart WEG. The role of life style in the etiology of stroke. A population based case control study in Perth. Western Australia, *Stroke*. 1994;52(25):51-59.
13. Hossain AM. A dissertation on Analysis of risk factors for stroke in hospitalized patients in a medical college hospital BCPS. 2002 ;68.
14. Alom B. Stroke: evaluation of risk factors. *Bangladesh Journal of Neuroscience*. 1999;15:14-18.
15. Pongvarin N. Stroke in developing world. *Lancet*. 1998;352:19-22.
16. Wong KS. International perspective hospital based study of acute stroke oncedence. *Lancet*. 1998;252:54-65.
17. Alamgir SM, Mannan MA. Cerebrovascular Disease (A report of 53 cases). *Bangladesh Med Res Coun Bull*. 1975;1:45-50.
18. Yano K, Reed DM, Yin Y, Abbott RD. Risk of stroke in male cigarette smoker. *N Eng Med J*. 1986;315:717-720.
19. Jorgensen H, Nakayama H, Raachu HO, Olsen TS. Stroke in the patient with diabetes. The Copenhagen Stroke study. *Stroke*. 1994; 25:1977-1984.
20. Boysen G, Nyboe J, Appleyard M, Sorensen PS, Boas J. Stroke incidence and risk factors for stroke in Copenhagen, Denmark. *Stroke*. 1988;19:1345-1353.
21. Salonen JT, Puska P, Tuomilehto J, Homan K. Relation of blood pressure, serum lipids and smoking to the risk of cerebral stroke. A longitudinal study in eastern Finland. *Stroke*. 1982;13:327-333.
22. Herman B. Leyten ACM, Van Luijk JH, Frenken CWGM, Opde Low AAW, Schulle BPM. An elevation of risk factors for stroke in a Duch Community. *Stroke*. 1982;13:334-339.
23. Wade T, Hewer RL, Skilbeck CE, Davi RM, *Stroke: A critical approach to diagnosis treatment and management*. 1st ed. Lomdon, Chapman and Hall. 2002;218-232.