ORIGINAL RESEARCH

Prevalence of risk factors among Stroke patients in a tertiary care hospital at Gaya, Bihar

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ABSTRACT
Background and purpose: Stroke is one of the leading causes of death and disability worldwide. It imposes a major physical mental and financial burden over the patient, family and the country. Despite increasing burden of stroke in developing countries, population-baseddata are scarce. An event of stroke can be caused by a number of risk factors, some of which are nonmodifiable and some are modifiable. Hypertension, diabetes mellitus, heart diseases, hyperlipidemia and smoking belong to the modifiable group and their prevalence shows diversity worldwide The aim of the study was to find out the prevalence of different risk factors of strokes.
Methods: This observational study was carried out on 215 patients of stroke admitted in different medicine units of ANMMCH GAYA. Only patients having diagnosis of stroke, confirmed by CT scan or MRI, were recruited. Patients were grouped into ischemic or hemorrhagic stroke. Patients with subarachnoid hemorrhage, bleeding into an intracerebral space occupying lesion or intracerebral hematoma due to head injury were excluded from the study. Proper history was taken regarding presence of various risk factors and measures taken to control or prevent them. Enquiry about proper drug compliance was also done.
Results: A total of 215 patients were included in the study. 143 were males and 72 were females. Mean age was 62.7 years. 135 patients were of ischemic stroke (87 males and 48 females) and 80 patients were of hemorrhagic stroke (56 males and 24 females). 70.7% patients were hypertensives and 48.8% were diabetics. 36.7% had CAD and 36.2% was current or ex smokers. 56.7% patients were either overweight or obese. 102 patients had 2 risk factors, 33 had 3 and 10 patients had 4 risk factors. 13 patients had no identifiable risk factors.
Conclusion: it is better to prevent than to cure stroke. Identification and modification of risk factors is the best way to achieve this. Implementation of proper screening programme in public to identify risk factors and awareness of people about primary prevention should be done in this regard. This can reduce disability and mortality among stroke patients and alleviate the burden of stroke.

INTRODUCTION

Stroke is one of the most important cause of mortality and disability among adults and is second leading causes of death worldwide[1,2]. While Its incidence is increasing worldwide, a declining trend is seen in developed countries whereas a rising trend is seen in developing

countries[2]. A stroke, or cerebrovascular accident, is defined by the abrupt onset of a neurologic deficit that is attributable to a focal vascular cause[2]. A stroke can be classified as either ischemic or hemorrhagic stroke. There are a many factors that increase the chance that a person have an episode of stroke. Some of these factors cannot be reversed or changed for example age, sex, ethnicity and family history of stroke. But there are some risk factors can be removed like smoking and alcohol intake. Some risk factors are such that they can't be removed, but can be controlled with drugs or life style modification such as hypertension, diabetes, atrial fibrillation, hyperlipidemia. Effective and timely intervention offers a good chance of reducing stroke morbidity and mortality[3]. The most common risk factors for stroke, such as diabetes, hypertension dyslipidemia and smoking are frequently present in general population and improper or neglected treatment are quite common mainly due to lack of awareness, inadequate infrastructure and poverty particularly in Indian scenario[4]. Stroke imposes immense economic burden over the family as well as the country[5]. Prevention is the only way to decrease this enormous financial burden. Therefore the identification and control of modifiable risk factors is important in this context. Only few epidemiological studies on stroke are available from India[6-9]. So this study was carried out to find the prevalence of risk factors in patients of stroke at a tertiary care hospital.

MATERIAL AND METHODS

This study was an observational study done among 215 stroke patients admitted in different Medicine units of Medical College Hospital. The objective of the study was to assess the prevalence of risk factors of stroke and to identify the vulnerable risk group. The patients were classified based on the basis of CT scan or MRI findings as either ischemic or hemorrhagic stroke. Only patients having definite evidence of either ischemic or hemorrhagic stroke were included. All patients were evaluated for presences of hypertension (HTN), diabetes mellitus (DM), dyslipidemia, smoking and various types of heart diseases such as coronary artery disease (IHD), valvular heart disease (VHD), atrial fibrillation (AF). A detailed clinical history was taken. All the patients were asked about past history of hypertension, TIA, previous stroke, diabetes mellitus, heart disease, smoking and alcoholism. Each patient was questioned in detail according to a preplanned questionnaire. Special attention was given for the presence of above mentioned risk factor for cerebrovascular events. History was also asked about the drug treatment and compliance for the above conditions. A detailed general and systemic examination was done. HTN was defined according to JNC classification(Table 1), diabetes according to the diagnostic criteria described by WHO and hyperlipidemia as defined by ATP III classification(HDL<40 in males and <50 in females; TG>150). Necessary investigations were also done when required. Temporary elevation of blood pressure, which settled down without treatment by 1 week after stroke, was not considered as hypertension. Patients with head injury, primary or secondary brain tumor were excluded from the study.

Table 1: JNC classification of Hypertension

Blood pressure class	Systolic	Diastolic
Normal	<120	<80
Prehypertension	120-139	Or 80-89
Stage 1 HTN	140-159	Or 90-99
Stage 2 HTN	160 or more	Or 100 or more
Isolated systolic HTN	140 or more	And <90

RESULT

This study involved 215 patients. 143 were males and 72 were females. Mean age of the patients was 61.7 years (range 42- 82)(Table 2). 135 cases (62.8%) were of ischemic stroke

and rest were of hemorrhagic stroke (37.2%). 192 patients was admitted within 24 hours. 19 were admitted between 2nd to 5th day. 4 was admitted after 5th day . 92 cases were of right hemiparesis, rest 123 were of left hemiparesis. 155 patients admitted with altered sensorium. Most of them were of hemorrhagic stroke. 68 presented with cranial nerve involvement. Of those, 7th nerve was involved in 52 cases, 3rd nerve in 12 cases and 6th nerve in 4 cases. 23 patients presented with seizure(Table 4). Regarding the time of onset 148 presented in morning, 57 presented in evening, 10 came at late night(Table 3). 23 patients died in this study. 18 of them were of hemorrhagic stroke mostly large size, 5 were of ischemic stroke.

Table 2 Age group

Age	Male	Female
35-50	12	3
50-70	94	47
>70	37	22

Table 3 Time of onset

Time	No. of pt
Morning	148
Evening	57
Late night	10

Table 4 Clinical profile of patients

Clinical profile	Total no.	Males	Females
Hemorrhagic	80	56	24
Ischemic	135	87	48
Right hemiparesis	92	61	31
Left hemiparesis	123	82	41
Altered sensorium	155	93	62
Seizure	23	17	06
Cranial nerve involvement	68	42	26
Death	23	14	9

Regarding the presence of risk factors (Table 5), 182 patients were hypertensive. 139 were controlled with drug, rest 43 were either not taking any drug or taking it irregularly. As per JNC-7 criteria, Majority of patients were hypertensive with stage-2 hypertension (SBP>160, DBP>100) in 128 followed by stage-1 hypertension (SBP=140-159, DBP=90-99) in 24 and prehypertension (SBP=120-139, DBP=80-89) in 25 respectively. 105 patients were diabetic. 82 were well controlled and rest 23 were poorly controlled. 79 patients had CAD as shown in ECG. 78 had history of smoking either current or ex. 26 patients had history of previous stroke or TIA. 3 patients had valvular heart disease. 15 patients had AF of which 5 patients were newly diagnosed on admission after getting ECG done. 68 patients were obese (BMI>30) and 54 patients were overweight (BMI 25- 30) 102 patients had 2 risk factors, 33 patients had 3 risk factors and 10 patients had 4 risk factors.

Table 5 Presence of risk factors

Risk factor	Males	Females	Total (%)
Hypertension	112	40	152 (70.7)
Diabetes	80	25	105 (48.8)
CAD	49	30	79 (36.7)
Smoking	60	18	78 (36.2)
Dyslipidemia	45	18	63 (29.3)
Previous stroke or	21	5	26 (12)

TIA			
Obesity andoverweight	106	14	122 (56.7)
Atrial fibrilation	12	3	15 (6.9)
Valvular heartdisease	1	2	3 (1.4)

DISCUSSION

Stroke is a major public health problem and imposes a great burden to family, community and health care providers. Stroke occurs predominantly in middle and late years of life. Age is an important but non modifiable risk factor for stroke. The average age of stroke onset in this study is 61.7 years that is consistent with mean age of stroke in India (i.e. 63 years) found in some studies[4]. Incidence of stroke was observed to be 13.0% among individuals aged less than 50 in this study. Some hospital based studies in India shown a high percentage of stroke in young patients(cut off was 40 years) ranging from 15-30%[10]. There is male predominance of stroke in this study. The reason for this male predominance may be the prevalence and control of risk factors. These findings are consistent with what was found in study from coastal south India done in patients between 15-45 years[11]. Hypertension, diabetes mellitus, hyperlipidaemia, ischaemic heart disease, atrial fibrillation and smoking, are major modifiable risk factors for stroke. The prevalence of these stroke risk factors varies in different communities probably due to differences in cultural practices, different disease patterns, life style and distribution of ethnic groups[12]. This study found a high rate of tobacco use, particularly in men. Among tobacco users, 58% consumed cigarettes and the rest consumed local forms frequently used in India (bidis, smokeless tobacco, and hookah), which probably imposes a higher risk. This study also shown a good amount of uncontrolled diabetic and hypertensive patients presented with stroke which highlights the importance of stroke risk prevention measures. Day time or morning onset is found to be more common in this study, which is similar to what was found in other studies[13,14]. Abnormal lipid values were found in more than one third of the patients. The findings of this study were consistent to most other studies[15-18]. However further studies with larger sample sizes are required to find out trends and risk factors among stroke patients.

CONCLUSION

Diabetes, Hypertension, dyslipidemia, smoking, CAD, previous stroke or TIA all are stronger modifiable risk factor for stroke. Others are obesity and sedentary lifestyle. Most of the above mentioned risk factors can be modified but this needs public awareness, education, strict control with use of proper medication and lifestyle change. These factors should be the main focus for prevention of stroke as it is always better to prevent than to treat stroke. Individual-level and community-level measures to control these major risk factors are needed to reduce the burden of stroke. The necessity for creating awareness among the general public and health care professionals about effective stroke preventive strategies should not be neglected. Avoidance of risk factors when feasible, good control and proper follow up of all patients with risk factors should be ensured by educating the patient himself and the family members as it makes the patients disabled for months or years and imposes physical, mental as well as financial burden over the family and the country.

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