HEMORRHAGIC AND ISCHEMIC STROKE;
FREQUENCY IN HYPERTENSIVE PATIENTS PRESENTING WITH STROKE AT PAKISTAN INSTITUTE OF MEDICAL SCIENCES, ISLAMABAD

ORIGINAL
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ABSTRACT… Objective: To compare frequency of ischemic stroke with that of hemorrhagic stroke in hypertensive patients presenting with stroke at Pakistan Institute of Medical Sciences, Islamabad. **Study Design:** A cross-sectional study. **Place and duration:** Department of Neurology, Pakistan Institute of Medical Sciences, Islamabad from 17th July to 17th October 2010. **Patients and Methods:** One hundred consecutive hypertensive patients with stroke were analysed for this study. **Results:** Total of 100 cases, 52 cases were of ischemic stroke. Out of this, 50% had left middle cerebral artery, 42.30% right middle cerebral artery, 3.85% anterior cerebral artery and 3.85% posterior cerebral artery involved. 48 cases had haemorrhagic stroke. The cerebellum was involved in 2.08%, 2.08% had left anterior lobe involved. Pons and right parietal lobe was involved in 2.08% respectively. SAH in 12.50%, left basal ganglia in 29.17% and right basal ganglia was involved in 43.76%. **Conclusions:** The reported results suggest that in hypertensive patients the frequency of ischemic stroke is greater than hemorrhagic stroke.

Key words: Hypertension, Ischemic stroke, intracerebral haemorrhage.

INTRODUCTION

Cerebrovascular accident or stroke, according to World Health Organisation (WHO) criteria is defined as "rapidly developing symptoms and/ or signs of focal and at times global loss of cerebral function with no apparent cause other than that of the vascular origin[1]. According to WHO estimates for the year 2020, stroke will become the second leading cause of death and ischemic heart disease as the leading cause in developing and developed world[2]. There is evidence that elevated blood pressure (BP) for a long time increases the risk of developing stroke[3]. Hypertension (HTN) is the most prevalent and powerful modifiable risk factor for stroke, irrespective of geographic region and ethnic group[4,5]. Persons with HTN are about 3 or 4 times more likely to have a stroke[6]. Whereas diastolic BP was once thought to be the most important predictor of stroke, the relationship between stroke and HTN may be stronger for systolic than for diastolic BP[7]. Alter et al[8] observed an association between history of hypertension and recurrence of stroke. If BP is elevated to borderline, it is also a risk for stroke. Hypertension, if effectively treated reduces risk of stroke[9].

It contributes to the increase in the number of admissions in medical departments of our hospitals and is a major drain on the already strained health resources. It is obvious that the best way to manage the cerebrovascular disease is through prevention, as has already been proved in the case of ischemic heart disease. In Pakistan health care delivery system is deficient. Figures about the prevalence of stroke are not available, and neither are the risk factors known. Therefore it is difficult to mount and organize campaigns to acquaint the population with the risk factors in order to institute preventive measures[10].

The reasons for the greater burden of stroke in Asian populations remain unclear, and direct reliable evidence about the determinants of stroke in this region is therefore needed. Blood pressure is a key determinant of stroke. In this background we decide to carry out this study at Pakistan Institute of Medical Sciences, Islamabad to find out the frequency of hemorrhagic and ischemic stroke in hypertensive patients presenting with stroke.

PATIENTS AND METHODS

The study was carried out in Department of Neurology, Pakistan Institute of Medical Sciences, Islamabad. The study included hypertensive patients who presented with stroke from 17th July 2010 to17th October 2010.

One hundred consecutive hypertensive patients with stroke were enrolled. All hypertensive patients above age of 40 years of both sexes presenting with stroke were included. Patients with sudden onset neurological deficit due to trauma, diabetes mellitus, bleeding disorder, on anti-coagulants drugs were excluded. Patients were recruited from Neurology ward having signs and symptoms of stroke. All cases of stroke were admitted in Neurology ward, Pakistan Institute of Medical Sciences, Islamabad. The data was collected through proforma annexed. First of all, consent from the patient or relative was taken. All the patients were evaluated clinically with detailed history and a thorough clinical especially neurological examination was carried out. History was taken with special reference to history of hypertension. It was divided into 4 groups. i.e., <5 yrs, 5-10 yrs, 10-15yrs, >15 yrs. History of anti hypertensive, whether taken or not and if taken the patient is taking it with poor, satisfactory and good compliance based on history by patients or attendants and old record if available. History of previous complications including cerebral, coronary, renal and eyes were noted based on history and clinical examination.

Detailed neurological examination was carried out. CT scan carried out as the confirmative test to differentiate the type of stroke. It was done as a preliminary investigation. CT scan brain without contrast was done in each patient preferably within first 48 hours of presentation and Neurologist was consulted for every CT scan. Results were analyzed by using SPSS 11 program.

RESULTS

During study period a total of 100 patients were studied in Pakistan Institute of Medical Sciences, Islamabad with stroke having history of hypertension. 47% males and 53% were females.

Most of the patients of hemorrhagic stroke belonged to 51-60 years of age (29%). The patients of ischemic stroke belong to 61-70 years (26%) of age. Mean ages of patients 62.72±13.95 years [age range: 40-100 years] (Table I). Fifty five percent were on antihypertensive drugs. Out of these 55 patients, 61.83 had poor compliance, while it was satisfactory in 23.63% and good in 14.54%. The complications occurred in 17 patients (61.72%) have previous history of cerebral, 9 patients (32.14%) have coronary, 1 patient (3.57%) had eye involvement and 1 (3.57%) had renal complication.

Table-I. Frequency distribution of patients according to age (n=100)

Age (years)	Frequency	%age
40-50	16	16.0
51-60	29*	29.0
61-70	26*	26.0
71-80	16	16.0
81-90	09	9.0
91-100	04	4.0

**P>0.05 (Not significant)*

Table-II. Duration of hypertension in patients of strokes

Duration (years)	Frequency	%age
1-5	75	75.0
6-10	12	12.0
11-15	09	9.0
>15	04	4.0

Out of 100 patients, 52 patients had ischemic stroke and 48 had haemorrhagic stroke. Statistically it was not significant [P>0.05] (Table III). Out of 52 patients of ischemic stroke, left middle cerebral artery was involved in the 50%, 42.30% right middle cerebral artery, 3.85% had involvement of anterior cerebral artery and while in 3.85% posterior cerebral artery was involved. Out of 48 patients had hemorrhagic stroke, there was cerebellum involvement in 2.08%, while 2.08% involvement was noted in left anterior lobe. Pons and right parietal lobe involvement was noted in 2.08%. SAH in 12.50%, and left basal ganglia in 29.17% and right basal ganglia was involved in 43.76%.

As far as gender distribution was concerned, 27 were males and 26 were females recorded in ischemic stroke and 23 males and 24 females in haemorrhagic stroke.

Table-III. Pathological diagnosis in stroke patients

Pattern of stroke	No. of patients	%age
Ischemic	52	52.0
Haemorrhagic	48	48.0
P>0.05 (Not significant)		

DISCUSSION

Our study sought to determine the frequency of ischemic and haemorrhagic stroke in hypertensive patients in a Pakistani population. The study of epidemiology of stroke is extensive in Western countries, but relatively small data collected in Asian countries like Pakistan. Our present figures for the hypertensive patients show that ischemic stroke (52%) is more common than haemorrhagic stroke (48%). But the frequency of intracerebral bleed is high as compared to other study[11]. Greater elevation of blood pressure is more frequently associated with cerebral haemorrhage than cerebral infarction[12].

Contrary to the Western literature, the proportion of hemorrhagic stroke in Asian countries has been reported as high as 21-33%[11,13]. Reported frequency of intracerebral haemorrhage in our country is even higher, ranging from 24-46%[13,14]. Our results show even greater frequency of intracerebral bleed (48%).

Stroke is more prevalent in men than women and that is confirmed by many studies[15,16]. In our study males were 53 (53%) and females were 47 (47%) which is different from a study by Sacco RL et al where 57% were females which may be due to selection bias or geographical distribution[17]. Role of gender in predicting the stroke type in hypertensive patients is controversial. A study did not find any significant gender difference between the two stroke types[18]. Our study supports this observation.

The mean age of acquiring stroke in our study was 62.7 years which was slightly higher than 57.5 years reported by Akhter[19] and much lower than 70 years in United States[20]. This difference is possibly because of higher awareness and control of risk factors in United States or shorter life span in Pakistan as compared to Western countries.

A study on stroke in Asia has confirmed that incidence of stroke rises sharply with age, and in each age group, the incidence is higher in men than in women. This study also identifies the two most vulnerable age groups, viz; 45 to 54 in women and 65 to74 in men[10]. In our study, the most vulnerable age for ischemic stroke is between 61-70 years, and that of haemorrhagic stroke is 51-60 years. Age below 70 years has been found to predict hemorrhage[21]. We also found that younger age was associated with intracerebral haemorrhage. It is unclear why younger patients are more likely to have a hemorrhagic stroke.

Hypertension per se is most important risk factor for both ischemic and hemorrhagic stroke and reduction in blood pressure has been shown to decrease the risk of both stroke subtypes, however, risk reduction is greater for hemorrhagic stroke[22]. In hemorrhagic stroke contribution of other risk factors is not straightforward, however, it is logical to assume that various risk factors for atherosclerosis e.g. diabetes mellitus, Ischemic heart disease and dyslipidemia would increase the risk of ischemic strokes. Frequency of hemorrhagic stroke is higher in Asian population as well as in black Americans[11,13,14,23]. It has been attributed to uncontrolled hypertension[23]. Hypertension increases risk for ischemic infarction as well as haemorrhage, however, the predictors of ischemic versus hemorrhagic stroke in an

individual patient are not clear. A few studies have been done to address the issue[21,24]. In another study, the risk of stroke was increased by about 25% with each 10 mm of Hg increase in systolic blood pressure[25].

History of previous stroke is another important risk factor. In a study, out of 21 patients who gave history of a stroke in the past; there were four hypertensives, two smokers and two diabetics, while ten patients had shown no risk factor other than a previous stroke[10]. In our study, 17 out of 100 patients had previous history of stroke. As has been previously reported, only 23% and 40% of the hypertensive and diabetic patients respectively attending the hospital take drugs as prescribed[26]. In our study, 57% patients are taking drugs.

Several studies[27,28] have shown that compliance to anti-hypertensive therapy is relatively poor in young patients. In our study, 57% patients are taking drugs. Out of this, 61.83% had poor compliance, 23.63% satisfactory and 14.54% good compliance. This shows the increase in non-compliance as compared to above studies. Non-compliance to treatment is the main cause of stroke in our patients. Most of them were non-compliant to anti-hypertensive, resulting in stroke and other complications which are more expensive to treat. Blood pressure, due to its profound effects on the cerebral circulation, is the most critical determinant of the risk of stroke. Therefore, it is unquestionable that reduction in BP should be the centerpiece of any strategy for stroke prevention

CONCLUSIONS

The reported results suggest that in hypertensive patients the frequency of ischemic stroke is greater than hemorrhagic stroke.

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