Prevalence and Characteristics of Stroke in Internally Displaced Peoples Admitted to a Hospital in Bannu

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Abstract

Objective: To determine the prevalence and characteristics of stroke and its sub-types among internally displaced people (IDPs) admitted to Khalifa Gul Nawaz teaching hospital Bannu.

Patients and Methods: This cross sectional/observational study was carried out at department of medicine, KGN teaching hospital Bannu from 1st March 2015 to 27th November 2015. A total 50 patients of either sex, age range of 30-65 years and features of stroke, confirmed by CT scan brain were enrolled for the study. Purposive/judgmental sampling technique was adopted for sample collection. History and clinical examination were recorded and all the findings were documented into a Proforma. Brain imaging showing abnormalities including brain tumor, multiple sclerosis and meningitis etc. were excluded. The frequency and characteristics of stroke among the enrolled patients were assessed.

Results: Of the total 50 patients, 34(68%) presented with infarction stroke and 16(32%) with haemorrhagic stroke. Their mean age at presentation was 60 years ±8.92 SD. Hypertension 35(70%) and smoking 24(48%) were the important risk factors observed among males whereas diabetes mellitus 11(22%) & IHD16 (32%) were found more common among females.

Conclusion: The study showed high prevalence of stroke in the study group which is similar to that found in developed countries. Hypertension and smoking were common characteristics among males while diabetes & IHD were common among females.

Key Words: CT scan brain, Hypertension, Ischemic Heart Disease, Stroke.

Introduction

Stroke is one of the leading reasons for disability not only in Pakistan but also around the globe. Stroke is a rapidly developing clinical sign of focal disturbances of cerebral function lasting for more than 24 hours with the interruption of death with no obvious cause of vascular origin. Various studies strongly suggest the pervasiveness of vascular risk factors in Pakistani community which shows the huge burden of the disease in the country. The literature do not show any community based research study that reveals the pattern and features of stroke. Stroke is the 3rd most communal reason of demise & the 1st principal reason of debility in developed and developing countries.2 According to World Health Organization estimates, 5.5 million people deceased due to stroke in 2002, and about 20% of these demises happened in South Asia.3 The incidence of stroke in middle aged people in countries like Pakistan, India, China, Russia, and Brazil is 5 to 10 times higher than in countries like United States and United Kingdom.4 The incidence of stroke cannot be truly estimated due to lack of studies but an estimated annual incidence is 250 patients out of 10,000. The incidence is increasing yearly.5 This can be best understood by an example that 519 patients of stroke over a period of 22 months were admitted in a major university hospital in Karachi.6 Indian council of medical research managed a survey and displayed its report in which the incidence of stroke was 145/10,000 patients.7 These rates are also much higher than those reported previously from other parts of India. In China, the total average age-adjusted incidence of first-ever stroke ranged from 116 to 219 per 100 000 per year.8 There is only one published stroke prevalence study from Pakistan, conducted on adult pashtoon community residing in Karachi. This
study reports a prevalence of 4.8% which was alike in men and women.\textsuperscript{9}

A recently reported community survey in Kolkata revealed a stroke prevalence rate of 545 per 100,000 population, which is equal to or higher than that reported from developed countries. Demographics of stroke in community are lacking but hospital based studies have revealed relatively high proportion of young age stroke. Khan et al reported that 68/260 (26\%) of their patients were of 15-45 years of age.\textsuperscript{10} Vohra et al reported that 34\% of patients in their series were under age of 50 years.\textsuperscript{7} Syed et al reported a frequency of 28\% of young stroke under age of 55 years.\textsuperscript{6}

The mean age of patients with stroke diverges from 52-66 years in numerous research results and the male to female ratio is about 1.5.\textsuperscript{6,7,11-13} The comparatively young age of onset in patients with stroke is in keeping with the data of CHD from the Indian subcontinent which recommend that establishes almost 10 year earlier on average in this region compared with the rest of the world.\textsuperscript{14} Burden of major vascular risk factors i.e. hypertension, diabetes mellitus, smoking, dyslipidemia and obesity is massive in Pakistan. A cross sectional study at a public health center in a tertiary care hospital publicized that 39\% of the people having an age 18 years or above have either hypertension, dyslipidemia and history of active smoking.\textsuperscript{15} An identical report displayed the results of family history of IHD in 42\%, obesity in 24\%, hypertension in 19\%, and DM in 15\% of the patients. Another significant modifiable risk factors for both ischemic and haemorrhagic stroke is hypertension. Pakistan National Health Survey (1990-4) pointed out the huge burden of hypertension in the country.\textsuperscript{16} The overall prevalence of hypertension in Pakistanis aged 15 years and above was 19.0\% (95\% CI; 18.9-19.1).\textsuperscript{17} Twenty-two percent of the urban Pakistani population over the age of 15 years, and a third of those aged 45 years and above, had hypertension. The age-standardized prevalence varied strikingly, from 17.3 to 25.3\% in men and from 9.9 to 41.4\% in women, among the various ethnic groups, being highest in Balochi women and lowest in Sindhi women. Higher prevalence of hypertension in the urban dwellers is due to an excess of obesity in this population. They also showed a linear relation between age and systolic blood pressure.\textsuperscript{17}

The objective of the study was to determine the prevalence and characteristics of stroke and its sub-types among male and female patients (Internally displaced peoples) admitted to Khalifa Gul Nawaz teaching hospital Bannu, KPK.

\section*{Materials and Methods}

This study was conducted in medicine department, KGN teaching hospital Bannu from 1\textsuperscript{st} March 2015 to 27\textsuperscript{th} November 2015. Patients having some features of stroke confirmed by CT scan brain, admitted to KGN teaching hospital Bannu were included in this study. Patients with brain imaging abnormality including brain tumors, meningitis, multiple sclerosis etc. were excluded from the study. The proposed study was approved by KGN teaching hospital’s ethical committee. A verbal consent was taken from the patients/caretakers, a detailed history was compiled and a comprehensive physical examination (inclusive cardiovascular and neurological) was done according to a self-designed stroke questionnaire. The questionnaire included patient’s name, age, sex, past history of transient ischemic attack and family history, etc. The findings of the clinical examination were also documented in this pre-designed performa. Purposive/judgmental sampling technique was adopted for sample collection. The method of determining hemorrhagic or ischemic stroke was similar to that used in the stroke data bank. Hemorrhagic stroke was identified when intra-parenchymal (within the brain substance itself) bleeding was found by CT scan and when there was no evidence on the brain image of bleeding late into an ischemic infarct. Ischemic stroke was diagnosed when a focal deficit was present and an infarct was found on CT scan or no bleeding was seen in the brain image.

\subsection*{Hypertension:}

Patients were confirmed with hypertension if they either had the diagnosis of hypertension and/or were treated for hypertension prior to stroke. The blood pressure was noted after admission in the relevant ward rather than using the emergency room measurements that were typically higher. Hypertension, requiring treatment with drugs after stroke, two measurements of BP >160/95mm Hg after stroke or a single measurement of BP >180/110mm Hg were also considered to have hypertension. Patients with stroke who had fleeting hypertension due to Cushing reflex (increased intracranial pressure), who did not receive antihypertensive drugs and patients with BP <160/95mm
Hg at the time of discharge were not considered to have hypertension.

**Diabetes mellitus:** Diabetes mellitus was considered when subjects gave history of diabetes mellitus and/or were on diet/oral hypoglycemic drugs or received insulin treatment or had random blood sugar >200mg/dl during the hospital stay.

**Smoking:** Different categories of smokers were defined as, current smoker, a person who smoked at least one cigarette per day for the previous three months or more or had tobacco in any form. Ex-smoker, a person who smoked at least one cigarette per day for three months or more or had tobacco in any form at some period. Non-smoker, a person who did not meet the criteria for a current smoker or ex-smoker.

**Dyslipidemia:** Dyslipidemia was defined when a patient had a diagnosis of it and/or was on diet or lipid lowering agents or had fasting blood cholesterol >200mg/dl in the hospital stay.

**Cardiovascular causes:** Patients were considered to have a cardiac abnormality when they had a self-reported history of myocardial infarction or coronary artery bypass grafting. Lead ECG was done for each patient. The presence of high QRS voltage i.e. sum of S wave in V1 lead and R wave in V5 or V6 lead of 35 mm or more measures was considered evidence of left ventricular hypertrophy. ECG evidence of possible or definite myocardial ischemia i.e.1mm depression of ST segment or myocardial infarction by presence of Q/QS pattern was calculated and atrial fibrillation was reported.

Data analysis was done by using the software package SPSS. Qualitative variables were analysed by finding their frequencies and percentages and Chi-square test used to compare the risk factors in types of stroke. Quantitative variables were analyzed by calculating the mean; the standard deviation and student t test were applied to find the differences between the types of stroke. p value <0.05 was considered significant. The patients were followed up after one month. Those who did not turn up for follow up examination were pursued by their mobile contact. The demographic variables were gender and age (years). The research variables were hypertension, ischemic heart disease and diabetes mellitus. Descriptive statistics were applied to evaluate the data.

**Results**

Out of total 50 patients during the study period, 68% (n=34) presented with infarction stroke and 32% (n=16) with haemorrhagic stroke. Their mean age at presentation was 60 years ± 8.92 SD. Hypertension was found to be 76% (n=38) and smoking to be 48% (n=24) among males while the presence of DM was 22% (n=11) & IHD as 32% (n=16) among females. The results are shown in table 1. The various risk factors of stroke among male and female are shown in table 2. Presenting complaints of stroke among population was observed and is given in the table 3.

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<tr>
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<th>Cerebral Hemorrhage</th>
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<td>% of total</td>
<td>Count</td>
<td>% of total</td>
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<tr>
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<th>%age</th>
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<td>DM History</td>
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<tr>
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**Discussion**

Stroke is a major cause of morbidity and mortality with disability and social dependence throughout the world. Although identifying the risk factors and modifying them remain the most important mean of
reducing stroke incidence, yet increasing age is the strongest determinant of the no of new cases of stroke each year. The mean age of stroke in our study was 60 years which was lower than in the West where prevalent age is between 76-80 years. Role of gender in predicting the stroke type is controversial. In a population based case controlled study, men were noted to have odds ratio of 3.51 for ischemic infarction, however, another study did not show any difference. We also didn’t find any significant gender difference between the two stroke types. The proportion of cerebral infarction varied between 55% to 70.1% in the local studies and 60-84% in the Western studies. Most of the local, south Asian and eastern studies have suggested that the intracerebral hemorrhage was 21-45% as compared to the West. We found 68% cerebral infarction and 32% haemorrhagic stroke.

Hypertension is the most prevalent and powerful modifiable risk factor for both ischemic and haemorrhagic stroke, irrespective of geographic region and ethnic group. Persons with HTN are about 3 or 4 times more likely to have a stroke. In our study hypertension was the commonest risk factor present in 76% of patients followed by ischemic heart disease in 32% and diabetes mellitus in 22%, which is similar to that of studied by Mumtaz et al. Risk of stroke can be reduced by at least 38% with control of hypertension.

We found that diabetes mellitus in patients increases the likelihood of ischemic stroke by more than 3 folds. Results from a hospital based stroke database reveal that DM is an independent predictor of ischemic stroke in women. Hypercholesterolemia (> 250mg/dl) was found to be an independent predictor of ischemic versus haemorrhagic strokes. It is logical to assume that presence of hypercholesterolemia would increase the likelihood of ischemic stroke as this is an important risk factor for atherosclerosis associated with hypertension.

Pakistan stroke society is playing a pivotal role in improving public awareness and continuing medical education for the medical physicians. It was established in 2002. In the last 5 years this society has organized about 40 seminars and workshop around the country. Pakistan stroke society is also giving funds to different small scale stroke relating projects. This society is playing a major role to improve care and prevention of stroke, with the help of both government and non-government organization.

Limitation of the study: This study was conducted in an urban city teaching hospital for a time period of 9 months only which cannot be generalized for a large population. The most accurate measures of importance, etiological factors & risks can be estimated truthfully in large population.

Conclusion

Stroke is frequent, recurring condition, and is more often disabling than fatal. We found that hypertension, smoking, DM and hypercholesterolemia were major modifiable risk factors in the development of stroke. If these factors are detected and treated earlier then we can reduce the incidence and prevent the development of stroke. We didn’t find any significant gender difference between the two stroke types.

Conflict of interest

This study has no conflict of interest declared by any author.

References