CLINICAL SPECTRUM AND RISK FACTORS OF STROKE - A STUDY OF 80 PATIENTS

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ABSTRACT

Objective: To determine the clinical presentation and frequency of hypertension, diabetes mellitus, hyperlipidaemia, ischaemic heart disease, obesity, and other disorders which have a role in pathogenesis of stroke in patients belonging North Punjab.

Study Design: Descriptive Study

Place and duration of Study: Medicine Department of Combined Military Hospital Jhelum from September 2009 to September 2010.

Material and Methods: Patients with features of stroke confirmed by CT scan brain were enrolled. Brain imaging showing abnormality e.g. brain tumour, meningitis, multiple sclerosis and metabolic derangements that could explain focal neurologic deficit were the exclusion parameters. The clinical presentation and frequency of hypertension, diabetes mellitus, hyperlipidaemia, ischaemic heart disease, obesity, smoking, atrial fibrillation and past history of TIA /stroke among males and females were evaluated.

Results: A total of 80 consecutive patients with ischemic and hemorrhagic stroke were included in this study. There were 53 males and 27 female patients with male to female ratio of 1.9:1.   The age of patients ranged from 50 to 80 years. (Mean-63.75 years). Out of 80 patients, 42 (52.5%) had ischemic stroke and 35 (43.75%) had haemorrhagic stroke, 3 (3.75%) patients had subarachnoid haemmorrhage Sixty (75%) patients presented with right hemiparesis/hemiplegia, 17(21.25%) patients with left hemiparesis/hemiplegia, 12 (15%) were unable to speak properly, 24 (30%) patients had headache, 17(21.25%) patients developed coma, 08 (10%) had fits and 13 (16.25%) patients had vomiting. Hypertension was found in 51 (63.75%) patients, smoking in 35%, diabetes mellitus in 33.75%, hyperlipidaemia in 31.25%, ischaemic artery disease in 15%, obesity in 23.75%, past history of TIA /stroke in 15% and atrial fibrillation in 6.25%.

Conclusion: Frequency of hypertension, diabetes mellitus, hyperlipidaemia, ischaemic heart disease, and smoking was high in stroke patients. These can be modified by proper health education. This can have a great impact on the morbidity and mortality of stroke.

Key Words: Hypertension, Ischemic strokes, Intracerebral hemorrhage, Diabetes mellitus, Ischemic heart disease.

INTRODUCTION

Worldwide more than 16 million people suffer an acute stroke every year. Over 80% survive the acute insult but most victims are unfortunately left with long-term neurological deficits making stroke the leading cause of chronic disability in adults. In Pakistan, the incidence of stroke has not been well studied but the number is conservatively estimated as 350,000 per year. However one trial conducted in 2008 showed the prevalence of stroke to be 6.4% in Pakistan[1]. Stroke has been defined by W.H.O as "an acute neurological deficit with focal and at times global neurological dysfunction, lasting for more than 24 hours or, resulting in death before 24 hours and in which, after adequate investigations, clinical signs are presumed to be of a non traumatic vascular origin[2]. The 24-hour limit divides stroke from transient ischemic attack, which is a related syndrome of stroke symptoms that resolve completely within 24 hours. Stroke is a medical emergency and can cause permanent neurological damage, complications and death. It is the number two cause of death worldwide and may soon become the leading cause of death worldwide[3] The main pathological types of stroke are cerebral infarction, primary intra-cerebral haemorrhage and subarachnoid

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haemorrhage. In developed countries, about 85 to 90% of strokes are due to cerebral infarction and 10 to 15% due to intracerebral bleed (ICB)[4]. Infarction may be due to thrombosis and embolic phenomenon while haemorrhage is mostly due to aneurysms or hypertensive bleed. Usually the haemorrhage is very sudden in onset and cerebral infarction has gradual onset and is usually progressive over a period of day or so, until it reaches its peak[5.] To make a diagnosis of stroke, a detailed history and thorough clinical examination is mandatory followed by computerized tomography (CT) scan of the brain for confirmation[6.] CT scan is a simple, non-invasive and accurate investigation in distinguishing cerebral infarction from hemorrhage. CT scan is preferable to magnetic resonance imaging (MRI) in the acute stage because MRI does not easily detect intracranial haemorrhage within the first 48 hours after a bleeding episode[7]. The most common predisposing factor in both cerebral infarction and haemorrhage is hypertension[8.]   Other risk factors for stroke include advanced age, previous stroke or transient ischemic attack (TIA), diabetes mellitus, high cholesterol, cigarette smoking and atrial fibrillation. Although a number of studies have been done on risk factors of stroke but no study was done in this part of northern Punjab. This study was also designed to find out clinical presentation of stroke in our patients.

PATIENTS AND METHODS

A descriptive study was conducted on 80 patients of stroke with infarction and haemorrhage in CMH Jhelum. The duration of this study was one year, from September 2009 to September 2010. Criteria for inclusion consisted of patients admitted with acute stroke after 24 hours of stroke and patients having infarction or haemorrhage as a cause of stroke diagnosed on CT scan of the brain. Patients with stroke secondary to space occupying lesions, vascular lesions and blood dyscrasias were excluded. Stroke was initially diagnosed on clinical ground and confirmed on CT scan brain. CT scan brain was done at two private diagnostic centers located at Jhelum as well as at CMH Kharian. Different baseline investigations were done in all patients of stroke, which included electrocardiography, echo, x-ray chest, blood complete picture, cholesterol, blood sugar and lipid profile. After formal consent, patients fulfilling the inclusion criteria were further assessed through a detailed history of hypertension, diabetes mellitus, smoking, previous stroke, TIA (Transient ischaemic attack), previous myocardial infarction, angina, atrial fibrillation, alcohol intake and drugs used for hypertension and diabetes mellitus. Investigations like blood sugar, Lipid Profile, blood complete picture, Echo, and X-ray chest; CT Scan Brain findings were recorded in the Proforma. Other relevant data like name, age, sex, address, occupation, admission date and date of discharge were also recorded. Hypertension was defined as blood pressure >140/95 mmHg on two separate occasions or the use of antihypertensive medication at any time before the onset of stroke. Patients were diagnosed as diabetic if fasting plasma glucose level was >126mg/dl on more than one occasions or random glucose level >200 mg/dl on more than one occasion. Patients who were normoglycaemic at the time of presentation but had history of diabetes or were taking insulin or oral hypoglycaemics were also labeled as diabetics. Hyperlipidaemia was defined as cholesterol in excess of 200 mg/dl, triglycerides of more than 200 mg/dl, LDL of more than 130 mg/dl and HDL of less than 40 mg/dl in men and 50 mg/dl in wome irrespective of whether then were taking lipid lowering agents or not. Obesity in stroke patients was defined as BMI ≥ 25 kg/m^2,[9]. Data had been analyzed through SPSS version 15. Descriptive statisticis were used to describe the data.

RESULTS

Eighty consecutive patients with ischemic and hemorrhagic stroke were included in this study. There were 53 (66.2%) male and 27 (33.8%) female patients with male to female ratio of 1.9:1. The age of patients ranged from 50 to 80 years, with mean age of 63.75 years. Out of 80 patients, 42 (52.5%) had ischemic stroke and 35 (43.75%) had haemorrhagic stroke, 3 (3.75%) patients had subarachnoid

haemmorrhage (SAH). All patients of stroke with ischemia and haemorrhage presented from urban and rural areas. There were 56 (70%) patients belonging to rural areas while 24 (30%) were from urban areas. Majority of patients belonged to Jhelum and adjoining areas. Occupationwise 38 (47.5%) patients were farmers 10 (12.5%) were businesspersons, 22 (27.5%) were housewives and 10 (12.5%) were employees. Clinical presentation of these patients are shown in Table 1.

Maximum blood pressure in patients of stroke with ischemia or haemorrhage was 240/140 mmHg while average blood pressure recorded in all patients of stroke was 160/100mmHg. Frequency of various disorders in stroke patients are shown in Table 2.

DISCUSSION

Stroke is a common medical emergency with an annual incidence of between 180 and 300 per 100,000. It is the leading cause of adult disability and the second leading cause of mortality worldwide[10]. Stroke is responsible for three million deaths (and rising) in developing countries[11] and is a major cause of mortality and morbidity in Asian countries. It is a leading cause of functional impairments, with 20% of survivors requiring institutional care after three months and 15%-30% being permanently disabled[12]. In developed countries, about 85-90% of strokes are due to cerebral infarction and 10-15% due to intracranial haemorrhage. However studies show that haemorrhagic stroke constitutes a larger percentage in Asians. The incidence of haemorrhagic stroke in various Asian countries is as follows: Malaysia 33%, Indonesia and Singapore 26%, Taiwan 28%, Thailand, Hong Kong, Philippines and Korea 30 % while in India, the incidence of haemorrhagic stroke ranged from 35-40 % in different studies[13]. The hospital based studies in Pakistan have almost the same results[14]. The proportion of cerebral infarction varied between 55% to 70.1% in the local studies and 60% to 84% in the western while most of the local, South Asian and the eastern studies have suggested that the intracerebral hemorrhage was 21% to 45% as compared in the west i.e. 10% to 20%[15,16]. Other

Table-1: Clinical Presentation of Stroke n=80

Presenting Complaint	Frequency	Percentage
WEAKNESS RIGHT SIDE	60	75
WEAKNESS LEFT SIDE	17	21.25
VOMITING	13	16.25
HEADACHE	24	30
FITS	8	10
APHASIA	12	15
COMA	17	21.25

Table 2 - Frequency of various disorders in Patients of Stroke n=80

Disorder	Frequency	Percentage
Hypertension	51	63.75
Diabetes Mellitus	27	33.75
Smoking	28	35.00
Obesity	19	23.75
Hyperlipidemia	25	31.25
Ischaemic heart disease	12	15.00
Past history of stroke/ TIA	12	15.00
Atrial fibrillation	5	6.25%

hospital based studies conducted in Pakistan has revealed 31–40% cases of stroke due to cerebral hemorrhage and 60–69% due to ischemia in centers where facilities for CT scan were available[17,18]. We found 52.5% cerebral infarction and 43.75% hemorrhagic stroke. Incidence of hemorrhagic stroke is higher in our study and is probably due to higher incidence of hypertension in local population. Intrestingly in males incidence of intracerebral bleed (31.25%) was very close to cerebral infarction (32.50%) as compared to females where cerebral infarction (20%) was higher to intracerebral bleed (12%). Current treatments for patients with established stroke are relatively ineffective and risk factor interventions are the real hope of reducing stroke morbidity and mortality in populations[19]. Up to 50% of strokes may be attributable to elevated blood pressure and

hypertension is the most important modifiable risk factor for stroke. The risk of stroke has been shown to have direct relationship to elevation of both systolic and diastolic blood pressure in men and women of all ages the strongest association being with systolic blood pressure. The risk of stroke is increased by about 25% with each 10 mm of Hg rise in systolic blood pressure and with diastolic blood pressure of more than 110 mm of Hg risk is 15 times more than of individual with less than 80 mm of Hg[20]. Persons with HTN are about 3 or 4 times more likely to have a stroke. Risk of stroke can be reduced by at least 38% with control of hypertension[21]. The frequency of hypertension in our patients was 63.75% which is similar to 65.4% and 62% as reported in other local studies[22,23] however some studies have shown a much higher incidence of 82%[24]. Other risk factors which have consistently been identified include age, previous stroke, atrial fibrillation, smoking, diabetes mellitus, previous ischaemic heart disease (IHD), left ventricular hypertrophy, alcohol intake and past history of stroke[25]. Increasing age is clearly the strongest determinant of the number of new cases of stroke each year. The mean age of stroke in our study was 63.75 years, which was lower than in the west where incidence is between 76 to 80 years[26]. Stroke is more prevalent in men than women and that is confirmed by many studies[27]. The proportion of diabetes mellitus in our patients was 33.75% which is similar to 36 % as reported in other local study [22] but some other studies have reported lower incidence[23]. Results from a hospital based stroke database revealed that diabetes mellitus is an independent predictor of ischaemic stroke in women and subsequent study from the same database revealed that diabetes increases the likelihood of ischaemic stroke by approximately 2-folds[28]. Hyperlipidaemia was found to be an independent predictor of ischaemic vs hemorrhagic strokes. Hyperlipidaemia was found in 31.25% of patients in this study which is similar to 32.7% and 25.5% in other local studies[22,25]. However other studies have shown incidence of hyperlipidaemia in up to 62%

patients of stroke[24]. Present study recorded 35% male patients with smoking which is lower than 53% and 43% reported by other local studies [22,24] but higher than 24% reported elsewhere in Pakistan.[29]. Smoking increases stroke risk by producing acute effects on the risk of thrombus generation in narrowed arteries and chronic effects related to an increased burden of atherosclerosis[30]. Ischaemic heart disease is common in patients with stroke. It increases the estimated risk of stroke by 2 to 4 times. The frequency of IHD found in our population was 15%, while Western series had much higher frequency of 50% to 72%[31]. History of previous stroke/TIA has been shown to be associated with ischaemic strokes and history of previous stroke was present in 15% of patients in this study. In present study 23.75% cases were categorized as obese with a BMI ≥ 25 kg/m^2 however prevalence of obesity was quite high in females (71%) as compared to male patients (21%) of stroke. Atrial fibrillation was seen in 6.25 % patients of stroke in this study, it was somewhat higher to 3 % shown in another local study[32].

CONCLUSION

Incidence of hypertension, diabetes mellitus, hyperlipidaemia, ischaemic heart disease, and smoking was high in stroke patients in present study. These can be modified by proper health education. This can have a great impact on the morbidity and mortality of stroke.

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