ORIGINAL ARTICLE

Evaluation of clinical presentation and risk factors of stroke patients presenting to Akhtar Saeed Trust Hospitaland Farooq Hospital Lahore

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ABSTRACT

Aim: To evaluate the clinical presentation and risk factor of stroke patients at Akhtar Saeed Trust Hospital Lahore and Farooq Hospital Lahore

Study design: A prospective, observational study.

Place and duration of study: Department of medicine Akhtar Saeed medical and dental college Lahore for a period of 2 years from June 2016 to May 2018.

Methods & Results: The patients with a suspected diagnosis of stroke were included in the study. Total number of patients included in the study was 268. A total of 31 patients wasfound to have diagnoses other than the stroke and were excluded from the study. There were 132 male patients and 105 female patients with male to female ratio of 1.25. Patients of only adult age group (16-90 years) were studied. Majority of the patients (62.02%) were of old age group, 24.05% patients were of middle age group, 13.92% patients were of young age group.Out of 237 patients, 86.91%had ischemic stroke and 13.08% had hemorrhagic stroke. The patients who had ischemic stroke, 77.18% had stroke in the anterior circulation and 22.81% had stroke involving the posterior circulation. As far as risk factors for stroke are concerned, out of 237 patients, 53.16% had old age (>60 years), 34.17% were smokers, 73% had hypertension, 40.92% had diabetes mellitus, 38.39% had hyperlipidemia, 12.65% had family history of stroke and 10.97% had past history of ischemic heart disease.

Conclusion: Incidence of ischemic strokes is slightly higher while incidence of hemorrhagic stroke is slightly lower in Pakistan as compared to rest of the world. The data regarding stroke involving the anterior and posterior circulation ischemic strokes follows the global trends. Hypertension is the commonest risk factor in Pakistan followed by diabetes mellitus and smoking.

Keywords: Stroke, ischemic stroke, hemorrhagic stroke, anterior circulation, posterior circulation,

INTRODUCTION

Stroke is one the commonest cause of morbidity and mortality worldwide. According to WHO, stroke is the second leading cause of death and the third leading cause of disability[1]. Worldwide, 70% of strokes and 87% of both stroke-related deaths and disability occur in low- and middle-income countries[2,3]. Over the last four decades, the stroke incidence in developing countries has more than doubled. In stroke survivors, stroke related emotional, financial and disability burden is enormous. Most of the risk factors for stroke like hypertension, diabetes mellitus, smoking and hyperlipidemia have high prevalence amongst the populations worldwide[5,7,8,10,13,17-19], but poorly managed in developing countries because of limited resources and lack of insight. Whilst most of these risk factors are modifiable, aim should be to educate the masses about modifiable risk factors to reduce the incidence of disease. Stroke may be caused by a number of mechanisms, including thrombus, embolism, and hemorrhage[4]. The risk of stroke also increases with age doubling with each decade after the age of 45 years and over 70% of strokes occur above the age 70[5]. Dedicated stroke centers have better outcomes with respect to morbidity, mortality and recovery of stroke patients[6]. Hemorrhagic strokes are more serious and have worst prognosis than ischemic

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stroke[7]. In Pakistan, there have been a few research studies about the risk factors of stroke, but very few research studies on manifestations of disease at presentation and their relationship to outcome. This research study was designed to document the clinical features of stroke patients at presentation, and then division of patients according to the etiology of ischemia or hemorrhage and then further division according to the vascular territory involved in cases of ischemic stroke. The purpose of the study was also to compare the risk factors of stroke with countries worldwide.

METHODOLOGY

Both male and female patients who presented to Akhtar Saeed Trust Hospital and Farooq Hospital Lahore from June 2016 to March 2019 and were diagnosed to have first stroke were included in the study. Total number of patients included in the study was 268, aged between 16 to 90 years. The diagnosis was made on the basis of history and clinical examination and later on confirmed by the investigations and imaging. A diagnosis other than stroke was the exclusion criteria for the study. If a patient was found to have some other diagnosis apart from stroke, was excluded from the study. A total of 31 patients was excluded from the study based on that criteria. Complete biochemical profiles were checked which included complete blood count, blood glucose level, urea, creatinine, serum electrolytes, liver function tests, fasting lipid

profileand anti-nuclear antibodies (ANA). Chest X-Ray and ECG were performed. A full auto-immune screen was performed in selected patients. During their stay in the hospital, Doppler ultrasound of the carotid arteries, 24-hour holter monitoring and echocardiography were also performed. MRI and CT scan of the brain were performed to either confirm or exclude the diagnosis of stroke. Electroencephalography was performed in patients who suffered from seizures after stroke. A pre-designed questionnaire was used to gather the information about gender, age, neurological signs andsymptoms, and risk factors for stroke. Data was analyzed by using SPSS version 17.

RESULTS

A total of 268 patients with suspected clinical diagnosis of stroke were included in the study.A total of 31 patients were excluded from the study after the diagnosis was found to be other than stroke on the basis of investigations and imaging. A total of 237 patients was further studied. There were 132 male patients and 105 female patients with male to female ratio of 1.25. Patients of only adult age group (15-90 years) were studied. Majority of the patients, 147/237 (62.02%) were of old age group (60-90 years), 57/237(24.05 %) patients were of middle age group (40-59 years) and 33/237 (13.92%) patients were of young age group (15-39 years) as shown in table 1.

Out of 237 patients, 206/237 patients (86.91%) had ischemic stroke and the remaining 31/237 patients (13.08%) had hemorrhagic stroke. Out of 206 patients having ischemic stroke, 159/206 patients (77.18%) had stroke in the anterior circulation and the remaining 47/206 patients (22.81%) had stroke involving the posterior circulation as shown in table 2.

Out of 159 patients(77.18%),who had stroke involving the anterior circulation, 138/159 patients (86.79%) had contralateral hemiparesis, 3/159 patients (1.88%) had Ipsilateral homonymous hemianopia,45/159 patients (28.30%) had altered consciousness, 58/159 patients (36.47%) had aphasia, 60/159 (37.73%) patients had sensory deficits, 8/159 patients (5.03%) had contralateral hemiparesis (more in legs than arms), 5/159 patients (3.14%) had seizures,as shown in table 3.

Out of 47 patients (22.81%) who had stroke involving the posterior circulation, 27/47 patients (57.44%) had altered consciousness, 6/47 patients (12.76%) had diplopia, 2/47 patients (4.25%) had visual field deficits, 9/47 patients (19.14%) had vertigo, 8/47 patients (17.02%) had nystagmus, 7/47 patients (14.89%) had dysarthria, 8/47 patients (17.02%) had dysphagia, 8/47 patients (17.02%) had ataxia, 2/47 patients (4.25%) had cortical blindness and 2/47 patients (4.25%) had contralateral homonymous hemianopia as shown in table 4.

Out of 237 patients, 31/237 patients (13.08%) who had hemorrhagic stroke, 28/31 patients (90.32%) had focal neurological signs, 19/31patients (61.29%) had altered consciousness, 13/31 patients(41.93%) had vomiting, 24/31 patients (77.41%) had headache, and 4 patients (12.90%) had seizures as shown in table 5.

As far as risk factors for stroke are concerned, out of 237 patients, 126/237 patients (53.16%) had old age (>60

years), 81/237 patients (34.17%) were smokers, 173/237 patients (73%) had hypertension, 97/237 patients (40.92%) had diabetes mellitus, 91/237 patients (38.39%) had hyperlipidemia, 30/237 patients (12.65%) had family history of stroke and 26/237 patients (10.97%) had past history of ischemic heart disease as shown in table 6.

Table 1. Data of the stroke patients with respect to gender and age (n=237)

Age group	Frequency	Percentage
60-90 years	147/237	62.02
40-59 years	57/237	24.05
15-39 years	33/237	13.92

Male:Female ratio: 1.25

Table 2. Types of stroke and the area of the circulation

Type of stroke	Frequency	Percentage
Ischemic stroke	206/237	86.91
Hemorrhagic stroke	31/237	13.08
Anterior circulation	159/206	77.18
Posterior circulation	47/206	22.81

Table 3. The frequency of various clinical signs in ischemic stroke involving the anterior circulation.

Clinical Presentation	Frequency	%age
Anterior circulation		
Contralateral Hemiparesis	159/206	77.18
Ipsilateral homonymous hemianopia	138/159	86.79
	3/159	1.88
Altered consciousness		
Aphasia	45/159	28.30
Sensory deficits	58/159	36.47
Contralateral	60/159	37.73
hemiparesis(more in legs than arms)	8/159	5.03
Seizures	5/159	3.14%

Table 4: The frequency of various clinical signs in ischemic stroke involving the posterior circulation.

Clinical Presentation	Frequency	Percentage
Posterior circulation		
Altered consciousness	47/206	22.81%
Diplopia	27/47	57.44%
Visual field deficits	6/47	12.76%
Vertigo	2/47	4.25%
Nystagmus	9/47	19.14%
Dysarthria	8/47	17.02%
Dysphagia	7/47	14.89%
Ataxia	8/47	17.02%
Cortical blindness	8/47	17.02%
Contralateral	2/47	4.25%
homonymous hemianopia	2/47	4.25%

Table 5. The frequency of various clinical signs in hemorrhagic stroke.

Clinical Presentation	Frequency	Percentage
Hemorrhagic stroke	31/237	13.08%
Focal neurological signs	28/31	90.32%
Altered consciousness	19/31	61.29%
Vomiting	13/31	41.93%
Headache	24/31	77.41%
Seizures	04/31	12.90%

Table 6: The frequency of various risk factors for stroke

Risk factors	Frequency	Percentage
Old Age (>60 Years)	126/237	53.16%
Smoking	81/237	34.17%
Hypertension	173/237	73%
Diabetes Mellitus	97/237	40.92%
Hyperlipidemia	91/237	38.39%
Family history of stroke	30/237	12.65%
Ischemic heart disease	26/237	10.97%

DISCUSSION

A prospective, observational study consisting of a total of 268 patients with a suspected clinical diagnosis of strokewas carried out. A diagnosis other than stroke was the exclusion criteria for the study. If a patient was found to have some diagnosis other than the stroke, was excluded from the study. A total of 31 patients was excluded from the study after the diagnosis was found to be other than stroke on the basis of the investigations and imaging.A total of 237 patients was further studied.There were 132 male patients and 105 female patients with male to female ratio of 1.25:1.Basharatet al[8] in Islamabad showed a female to female ratio of 1.3:1. In 2013, Foerchet al[9], using data from hospital-based stroke patientsin China, Germany, India, and Iran showed gender distribution of acute stroke was variable among stroke patients throughout the world, the factors responsible for this phenomenon are not known.

Majority of the patients in our study, 147/237 (62.2%) were of old age group (60-90 years), 57/237(24.05%) patients were of middle age group (40-59 years) and 33/237 (13.92%) patients were of young age group (15-39 years).El Tallawyet al[10]in Egypt showed similar results with higher prevalence of stroke patients with advancing age.Kelly-Hayeset al[5]in USA concluded the risk of stroke doubles with each decade after the age of 45 years.Although Brettet al[11] in2012 showed that more patients at younger age are suffering from stroke.

Our study showed 206/237 (86.91%) patients had ischemic stroke and 31/237 (13.08%) patients had hemorrhagic stroke.Anderson et al[7] in Denmarkshowed almost similar results of 90% ischemic stroke and 10% hemorrhagic stroke, however El Tallawy et al[10]in Egypt revealed 85.1% of ischemic stroke. Worldwide incidence of ischemic stroke is considered to be 80-85%, and hemorrhagic stroke 15-20%.

Out of 206 ischemic stroke patients, 159/206 (77.18%) had stroke involving the anterior circulation. The diagnosis was based on clinical features and supported by CT and MRI of brain.We can compare the results of our study to Tao et al[12]which was similar to our study in many aspects. Tao et al[12] in china in 2012 showed similar percentage of ischemic stroke involving the anterior circulation. As for as focal neurological signs are concerned, 86.79 % patients had contralateral hemiparesis in our studywhich was bit higher as compared to 75.43% in Tao et al[12], while the percentage of ipsilateral hemianopia was similar (2%) in both studies. In our study 36.47% patients had aphasia which was high as compared to 22.33% in Tao et al[12], altered consciousness was 28.30% as compared to 22%, sensory deficits were 37.73% as compared to 41.23%, contralateral hemiparesis (more in

legs than arms) was 5.03% was a bit lower as compared to 9.12% and seizures were present in 3.14% of patients as compared to 1% in Tao et al[12].Prevalence of stroke involving the occlusion of anterior cerebral circulation is 70% if we take into consideration the stroke statistics worldwide which is a bit lower than found in our study.

Out of 206 ischemic stroke patients, 47/206 (23%) had stroke involving the posterior circulation. If we compare the data of posterior circulation infarct of our study to Tao et al[12], a similar study carried out in china which showed almost similar percentage (26%) of patients having stroke in the posterior circulation. If we compare the individual clinical features of both the studies, there were a few similarities with some differences.The incidence of altered consciousness was considerably high in our study as compared to Tao et al[12], while the frequencies of homonymous hemianopia and nystagmus were in the same range. The incidence of ataxia was 31% in our study which was a bit higher than the incidence recorded in Tao et al[12]. Further studies need to be carried out to account for these differences.

Out of 237 stroke patients in our study, 31/237 (13.08%) had hemorrhagic infarct. Andersen et al[7]in Denmark in showed slightly lower incidence of hemorrhagic stroke (10.1%), however Bilić et al[13]showed similar incidence of hemorrhagic stroke as compared to our study. However Ojaghihaghighiet al[14]in Iran showed markedly high incidence of hemorrhagic stroke.The different incidence of hemorrhagic infarct in different parts of the world indicates that both environmental and genetic factors may be involved in the etiology of hemorrhagic stroke. If we compare the individual clinical features in our study to El Tallawyet al[10]in Egypt, the incidences of focal neurological signs and altered consciousness and seizures were almost same in both studies. The incidence of vomiting was lower, while the incidence of headache was a bit higher as compared to El Tallawyet al[10]. Further studies are needed to be carried out to confirm these findings.

As far as risk factors for stroke are concerned, out of 237 patients, 53.16% had old age (>60 years), which is a well-known risk factor as documented in earlier studies[10,15,16]. In our study, 34.17% patients were smokers, these results were similar to the results of studies conducted earlier in Egypt[10]and Pakistan[7, 17]. On the contrary, Pathaket al[15] in Nepalshowed very high percentage (61.35%) of patients of stroke who were smokers. The reason for that that remains unknown. Hypertension was the commonest risk factor (73%) in our study, the results were similar to studies carried out earlier in Egypt[10], Nepal[15] and Pakistan[17-19]. In our study, 40.92% patients had diabetes mellitus, these results were slightly higher than the studies conducted earlierEl Tallawyet al[10] in Egypt andPathak et al[15] in Nepal, however studies carried out earlier in Pakistan[17-19] showed similar results. These results show that stroke patients in Pakistan have higher percentage of diabetic patients than the rest of the developing countries. Hyperlipidemia was present in 38.39% of stroke patients in our study, the results were similar to the studies carried out earlier in Pakistan[18,19]; but the results were markedly lower than El Tallawyet al[10] in Egypt. However, Inzitariet al[20]in USA showed that history of diabetes and hyperlipidemia, not hypertension, were

associated independently with lacunar stroke. Family history of stroke was present in 12.65% of our stroke patients, whileEl Tallawyet al[10] in Egypt showed a markedly lower percentage of patients having family history of stroke. Genetic factors may account for these differences in results. History of ischemic heart disease was present in 10.97% of patients, the results were similar to studies carried out earlier in Pakistan[17-19] and El Tallawyet al[10] in Egypt.

CONCLUSION:

Strokes are marginally more common in males than females. Incidence of ischemic strokes is slightly more while incidence of hemorrhagic stroke is slightly less in Pakistan as compared to rest of the world. The data regarding stroke involving the anterior and posterior circulation ischemic strokes follows the global trends. There are many similarities with a few differences in the clinical manifestations of both ischemic and hemorrhagic stroke in Pakistan as compared to the worldwide data regarding these aspects. Globally, old age is the most important risk factor for stroke as in Pakistan. Hypertension is the commonest risk factor in Pakistan as in the rest of the developing countries. Diabetes mellitus and smoking are the next common risk factors. Diabetes mellitus is more common, while hyperlipidemia is less common in stroke patients in Pakistan than the rest of the world. In Pakistan, prevalence of ischemic heart disease in stroke patients is the same as the rest of the world.

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