Major Contributing Factors for First Ever Cerebral Infarction

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Abstract

Objective: To evaluate frequency of major contributing factors for the first ever cerebral infarction.

Patients and Methods: This cross sectional study was conducted in Shaikh Zayed Hospital, Lahore, in a period of six months. About 150 patients of both gender and all ages were enrolled in this study. Patient were screened for the presence of cerebral infarction clinically which was further confirmed on brain CT scan. Moreover, patients were also evaluated for history of transient ischemic attacks, hypertension, diabetes mellitus, atrial fibrillation, smoke, dyslipidemia and Ischemic heart disease, to find out association with cerebral infarction.

Results: Mean age of patients included in the study was 63.44 ±11.82 SD years and among them 83 patients were male and 67 patients were female. Hypertension was found in 80% of patients, followed by diabetes mellitus in 45.3%, dyslipidemia in 38.7%, Ischemic heart disease in 38%, smoking in 16%, previous history of Transient ischemic attack in 9.3% while 1.3% of patients gave history of atrial fibrillation before they developed cerebral infarction.

Conclusion: Hypertension and Diabetes were found to be the most common risk factors for cerebral infarction, patients with these diseases should be strictly monitored and meticulously treated.

Key Words: Cerebral Infarction, Hypertension, Stroke.

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Introduction

Stroke is the leading cause of death throughout the world.[1] Stroke is classically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system (CNS) by a vascular cause, including cerebral infarction, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH), and is a major cause of disability and death worldwide. There are two main types: 1. Ischemic 2. Hemorrhagic. Approximately 80% of strokes are due to ischemia and 20% due to brain hemorrhage.[2] The term cerebral Infarction is used when there is evidence of brain or retinal cell death due to cerebral ischemia on CT scan.[3,4] Whereas subarachnoid hemorrhage results in neurological dysfunction and/or headache because of bleeding into the subarachnoid space, which is not caused by trauma.

It is noted that the cases reported with stroke have shown decline for the western population. But the burden of the disease in South Asian countries has increased and is expected to affect more people living in third part of world. It is roughly estimated that annual cases reported are 250/100,000 with 350,000 new cases.[5] If we want to determine the actual frequency of stroke with respect to population, the results will be alarming as a large number of cases are not reported in Pakistan. It can cause wide impact on life of an individual starting from physical disability to death and other multidimensional effects. Moreover, these consequences do not only affect the individual or his/her family but also society as a whole.[6]

Stroke is an important health problem and for improvement of public health it is important to know about the risk factors that are associated with it, in particular risk factors that are associated with their lifestyle. There are various modifiable and non-modifiable risk factors for stroke. Non-modifiable risk factors include age, sex, race, ethnicity and genetic factors. Modifiable risk factors include hypertension,

diabetes, atrial fibrillation, smoking, dyslipidemias, cardiac conditions, obesity, physical inactivity and alcohol consumption.[7,8] Among these modifiable risk factors, the most important factors that are associated with stroke are hypertension, diabetes and coronary artery disease. The role of lifestyle as risk factor for stroke is not definite. Smoking, alcohol consumption, increased weight, physical inactivity all may play some role.

Ischemic brain injury can have impact on a person from many dimensions. Mainly Ischemic brain injury results in cascade of events from energy depletion to cell death. In the first minutes to hours, therefore clinical deficits do not necessarily reflect irreversible damage. This condition can lead to infarct if timely measures are not taken for reperfusion. Time taken to develop infarct depends upon the residual blood flow rate and time elapsed after ischemia.[9] Cerebral infarction is a cause of significant morbidity and mortality worldwide, therefore identification of factors associated with this condition is important and its prevention should be a main concern. Moreover, the relative importance of various risk factors may vary between countries and between ethnic groups. So the studies on risk factors in different geographic regions and risk factors in patients suffering from different types of stoke should be evaluated. This study was thus designed to identify frequency of major factors associated with stroke due to cerebral infarction in local setting.

Materials and Methods

This descriptive cross sectional study was conducted in Medical Department of Shaikh Zayed Hospital, Lahore, for a period of about six months from Sep 2009 to Mar 2010. A total of 150 cases of atrial fibrillation were enrolled after taking their informed consent. Cerebral infarction was considered on basis of focal neurological deficit on clinical examination and evidence of infarction on brain imaging (Computed Tomography or Magnetic Resonance Imaging. Patients of age >20 year of both sexes were taken. It was confirmed that patient has first episode of stroke using CT scan. All those patients who fulfilled the above mentioned criteria were further evaluated for contributing factors. Contributing factors like history of TIA (previous history of transient neurological deficit), hypertension (known hypertensive or requiring antihypertensive drugs after stroke), diabetes mellitus, atrial fibrillation (diagnosed on electrocardiography), history of smoking (5/pack year), ischemic heart disease (history of angina or MI) and dyslipidemia (raised fasting cholesterol or triglycerides). All the information gathered from the patients were entered on a pre- designed proforma.

Data was analyzed by using SPSS version 20. Quantitative data is presented by mean and standard deviation while qualitative data is presented by frequency and percentages.

Results

One fifty patients with first presentation of cerebral infarction were included in the study. Mean age of the patient was 63.44 ± 11.82. There were 83 (55.3%) males and 67 (45%) females. Data analysis also showed that 24 patients (16%) were smokers. Hypertension was found in 120 patients (80%), 22 patients (14.7%) presented with normal level of total cholesterol and triglycerides. 33 patients (22%) showed raised level of total cholesterol and 3 patients (2%) had raised levels of triglycerides. There were 68 patients (45.3%) had diabetes mellitus. About 14 (9.3%) patients gave history of TIAs. Atrial fibrillation was found in 2 patients (1.3%) and 38 patients (25.3%) have had ischemic heart disease. (Table-I),

Table1:Frequency of Contributing Factors for First ever Cerebral imfarct	
Associated Factor	No (%)
Hypertension	120 (80)
Diabetes Mellitus	68 (45.3)
Dyslipidemia	58 (38.7)
IHD	38 (25.2)
Smoking	24 (16)
TIA	14 (9.3)
Atrial fibrillation	02 (1.3)

Discussion

The present study was conducted to look into various risk factors associated with stroke. Mean age of our patients was 63 years and this has been noted in other studies that age of greater than 65 years arise as a contributing factor and people of this age group are more vulnerable for the first attack of stroke.[1] Other studies have shown comparable results.[10,11] In another study conducted by Javed M. et al the mean age was 52 years.[12] Male to female ratio in our study was 1.2:1. Almost similar findings have been reported in other studies.[13,14] In present study hypertension was found to be the most common risk factor (80%) in patients presenting with cerebral infarction. This result is consistent with previous studies performed in west and as well as in Pakistan.[10,15] In one study at Malaysia hypertension was found in 71.5% patients presenting with stroke.[16] In another study done on patients of stroke, in Poland hypertension was 68% in males and 72% in females.[17] Various studies performed in Pakistan reported hypertension (55-70.6%).[18-24]

Diabetes mellitus is associated with a two to six-fold increased risk for first or recurrent ischemic stroke.[22] In present study diabetes mellitus was seen in 45.3% patients. This finding is slightly higher than the results of a study done in Malaysia (40.2%).[9] Other studies have shown slightly lower frequency (32%, 33.4%) respectively.[12,18] Marwat et al reported hypertension in 75% and Diabetes in 54.5% patients respectively.[23] Hyperlipidemia is another

important risk factor associated with cerebral infarction. It is reported that 10% of entire population has a fasting cholesterol level of more than 240 mg/dl.[3] Moreover with the increasing age the hypocholesteremia also increases.[24] Ischemic heart disease is an important vascular disorder that increases the risk of ischemic stroke. In present study 38% patients were found to have ischemic heart disease. Other studies have shown 9-47% patients of stroke with history of ischemic heart disease.[25,26] Tariq Mehmood et al reported hypertension in 73%, Diabetes in 42.5%, IHD in 38%, smoking in 29% and obesity in 27% patients of stroke. [27]

The estimated relative risk for stroke among smokers is 1.5 to 2.9 times that of nonsmokers. After 5-10 years, people who quit smoking reduce their risk of stroke to that of nonsmokers. In our study the prevalence of smoking was very low as compared to international studies.[28] This may be because of overall low incidence of smoking in our country as compared to western countries. Regarding association with TIAs, a study was conducted in Karachi which reported a prevalence of 9.7% for TIA.[29] In present study history of TIA was found in 9.3% of patients, which is much lower than the result shown in previous study conducted at Karachi (24.9%).[1] Hence stating that there is very less involvement of TIA in cases of cerebral infarction. There was controversy regarding the involvement of atrial fibrillation as a factors for cerebral infarction. Some studies reported that its frequency is between 3-25% while other reported as 3%.[30,31] But in our study it was 1.3%. This was a very low percentage and may be due to the setup in which this study was carried out.

Conclusion

Hypertension and Diabetes were found to be the commonest risk factor in patients with cerebral infarction.

Conflict of Interest

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

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Corrigendum

In Volume 1(2) April-June 2012 the name of the first author (Muhammad Rafiq) article titled "spectrum of bone Lesions at Pakistan Institute of Medical Sciences" pp69-71 was wrongly written due to typographic error.
Rafiq Ahmad and Ashok Kumae Tanwani