Original Article

FREQUENCY OF RISK FACTORS OF CEREBRAL INFARCTION IN STROKE PATIENTS. A STUDY OF 100 CASES IN NASEER TEACHING HOSPITAL, PESHAWAR

M. Safeer[1], M. Tariq[2], Ubaid ur Rehman[3]

ABSTRACT

Objective: To study the risk factors of cerebral infarction in stroke patients.

Methodology: It is a descriptive hospital based study conducted at the Department of Medicine, Naseer Teaching Hospital, Peshawar from January 2005 to December 2005. One hundred patients of stroke with cerebral infarction confirmed on C.T. scan brain and more than twenty years of age were included. Risk factors for cerebral infarction were defined in terms of hypertension, diabetes mellitus, ischemic heart disease, smoking, dyslipidaemia, TIAs (transient ischemic attacks), carotid artery stenosis and family history of stroke.

Results: Data of 100 cases with cerebral infarction was recorded. Most of the patients had more than one risk factors for cerebral infarction. hypertension was commonest risk factor (55%), smoking (30%), ischemic heart disease (34%), diabetes mellitus) (26%), hyperlipedaemia (30%), atrial fibrillation (25%), carotid artery stenosis (27%), obesity (15%) and family history of stroke (12%). 39% of patients had physical inactivity. Males were slightly predominant than females (51% vs 49%) and mean age was 50 years. females were rather older with mean age of 53 years.

Conclusions: Cerebral infarction accounts for 80 to 85% of cases of stroke, which is a common neurological disorder. It increases a burden of disability and misery for patients and their families. Most of the risk factors of cerebral infarction are modifiable, its prevention should be the main cause of concern for the community.

KEY WORDS: Stroke, Cerebral infarction, Risk factors.

1.   Dr. Muhammad Safeer FCPS,
     Assistant Professor,
     Department of Medicine,
     Naseer Teaching Hospital,
     Kabir Medical College,
     Gandhara University,
     Nasir Bagh Road Peshawar.
2.   Dr. Muhammad Tariq, M.Phil,
     Assistant Professor, Dept. of Physiology,
3.   Dr. Ubaid ur Rehman, MBBS,
     Senior Lecturer,
     Dept. of Biochemistry,
2-3: Kabir Medical College,
     Gandhara University,
     Peshawar - Pakistan.

     Correspondence

     Dr. Muhammad Safeer FCPS,
     E-mail: Dr.safeer@hotmail.com

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INTRODUCTION

Stroke is an acute neurological deficit lasting more than twenty four hours. Cerebral infarction accounts for 80 to 85% of cases of stroke.[1] Stroke kills about five million people each year making this the second major cause of death worldwide. At least fifteen million others have non-fatal stroke annually, and about a third are disabled as a consequence.[2] Non-modifiable risk factors for cerebral infarction include age, sex, family history, race and ethnicity. Modifiable risk factors for cerebral infarction include hypertension, diabetes mellitus, cardiac disease (particularly atrial fibrillation), hyperlipidaemia, smoking, transient ischemic attacks, asymptomatic carotid artery stenosis, alcohol abuse and physical inactivity.[3] The objective of this study was to identify risk fac-

tors of cerebral infarction and to assess that most of the modifiable risk factors are preventable by proper education of patients and treatment of underlying risk factors.

PATIENTS AND METHODS

This was a descriptive hospital based study. The study was conducted in department of medicine, Naseer Teaching Hospital, Peshawar from January 2005 to December 2005. Stroke patients were mainly admitted from emergency ward (93%) and remaining 7% from out patient department.

Inclusion Criteria: Following selection criteria was followed.
1. All patients with first ever stroke presenting within 24 hours of onset of symptoms.
2. Patients 20 years and above and both sexes.
3. C.T. Scan brain confirmed cerebral infarction.

Exclusion Criteria: Following patients were excluded from study.
1. Stroke patients in whom C.T. Scan brain revealed pathology other than cerebral infarction like, haemorrhages, tuberculomas.
2. Clinically unstable patients requiring respirator or intensive care or could not be moved for relevant investigations.

A detailed history was taken with especial emphasis on risk factors of cerebral infarction like diabetes mellitus, hypertension, ischemic heart disease, previous strokes or TIAs, smoking, obesity, valvular heart disease, amount of physical activity, alcohol use and in female patients history of contraceptive pills. Clinical evaluation included blood pressure record, carotid bruit, evidence of atrial fibrillation and neurological examination. After thorough examination patients were subjected to investigations like Hb%, fasting blood sugar, fasting serum lipid profile, ECG, X-ray chest and C.T. scan brain. In selected patients echocardiography and Doppler study of carotids were done.

Criteria: Stroke was defined according to WHO criteria "rapidly developing symptoms/signs of focal and at time global loss of cerebral function without apparent cause other than that of vascular origin".

Cerebral Infarction: Cerebral infarction was diagnosed when C.T. scan brain showed hypodense area corresponding to the clinical picture.
Criteria for risk factors of cerebral infarction:

Hypertension: Hypertension was considered to be present if the patients were taking antihypertensive drugs or if the blood pressure was greater than 160 mm Hg systolic and 90 mm Hg diastolic on three separate readings.

Diabetes Mellitus: Diabetes was confirmed in patients clinical record taking oral hypoglycemic drugs or insulin or if the fasting blood glucose was greater than 126 mg/dl.

Dyslipidaemia: This was assessed by raised fasting serum cholesterol and triglycerides levels.

Ischemic Heart Disease: Ischemic heart disease was considered when present/past history of chest pain along with pathological Q waves/ST segment changes in ECG.

Smoking: History was considered positive if patient smoked five pack years.

Obesity: It was labeled positive if the weight was more than 15% above the ideal body weight for age and height.

Family History: It was considered positive if at least one first degree relative or two or more second degree relatives had a history of stroke.

RESULTS

Data of 100 cases with cerebral infarction was recorded during the study period. In this study males were slightly predominant (51% vs 49%) with age ranging from 21 to 78 years. (mean age 50 years), while females were rather older with age ranging from 24 to 83 years (mean age 53 years).The most likely stroke prone age was 7th decade. Most of the patients had more than one risk factor (Table-I). Hypertension was the commonest risk factor found in 55% of patients. Out of 55, 45 patients were known hypertensive and 10 were not aware of hypertension before the

Table-I: Frequency of risk factors of cerebral infarction in stroke patients

No. of risk factors	No. of patients (N=100)
One	19
Two	23
Three	37
Four	15
Five	06

Table-II: Frequency of risk factors of cerebral infarction in stroke patients (N = 100)

Risk Factors	No. of patients
Hypertension	55
Smoking	31
Ischemic heart disease	34
Hyperlipidaemia	30
Diabetes mellitus	26
Carotid artery stenosis	22
Atrial fibrillation	25
Obesity	15
Family history of stroke	12
Physical inactivity	39

occurrence of stroke. There was positive history of smoking in 30% of patients and majority were smoking more than one pack of cigarettes a day for longer than 16 years. Diabetes mellitus was found in 26% of patient. All were cases of NIDDM and they had poor glycemic control. Fifteen patients were using oral hypoglycemic agents regularly, but paying no attention on their diet control. Remaining eleven patients were taking anti-diabetic drugs very irregularly. They were blaming high cost of drugs. Atrial fibrillation was found in 25% of patients, hyperlipidaemia in 30% and ischemic heart disease in 34% of patients (Table-II). Most of the patients were of lower middle class. Average hospital stay was 10 days. Mortality was 8%. Most of our patients (89%) were still dependent for daily activities at the time of discharge from hospital.

DISCUSSION

The risk of stroke increases with age[4] and the mean age in our study was 51.5 years which was much lower than 70 years reported by Sacco RL[5] and slightly lower than 53 years reported by Akher.[6] This difference is possibly because of poor awareness and poor control of risk factors of cerebral infarction in Pakistan as compared to western countries.

In both male and female patients the most prone age for cerebral infarction was 60 to 70 years similar as reported by Al-Rajeh.[7] Hypertension was the most common risk factor of cerebral infarction in our study, found in 55% of patient. This figure is almost similar to that reported by Ali-L et al[8] and Al-Rajeh[7] and lower than 60% reported by Nasir Mehmood[9] and

61% reported by Rafiq et al[6] and much lower than reported by Burgin WS et al (65%)[10] and FeiginVL et al (85%).[11]

Hypertension is well established risk factor of cerebral infarction.[12] Risk of stroke can be reduced by at least 38% by control of hypertension.[13]

Diabetes mellitus is an established risk factor for stroke and cerebral infarction is more common in diabetics.[14] In the present study diabetes mellitus was seen in 26% of cases of cerebral infarction. Qureshi et al has reported 11.6% of cerebral infarction in diabetics,[15] which is lower as compared to our study. Other studies have shown a wide range (13 to 36 %) of cases of cerebral infarction in diabetes mellitus.[16] In our study out of 26 diabetic patients, 14 were hypertensive and 12 had hyperlipidaemia.

Smoking is associated with increased risk of cerebral infarction and the risk increases with number of cigarettes smoked per day.[17] In our study smoking was found in 31% of patients. The figure is slightly higher than other reported studies in Pakistan[9,18] and much lower than studies reported in Greenland (81%).[19]

Dyslipidaemia was found in 30% of patients. This figure is higher than 11-23% reported in other studies from Pakistan.[8,9] All patients with dyslipidaemia had elevated triglycerides and cholesterol levels.

Obesity as a risk factor for cerebral infarction was found in 15% of patients, some of them were also hypertensive, diabetic and hyperlipidaemic. Ansari found almost similar cases in his study.[20] Atrial fibrillation was observed in 25% of cases which was much higher reported by Basharat et al 7%[21] and Burgin-WS 11%.[10] Ischemic heart disease and ischemic strokes are close relatives being atherosclerotic diseases. It has been documented that ischemic heart disease not only myocardial infarction (Q and non Q wave) but also angina pectoris and silent myocardial infarction increase the risk of ischemic stroke.[22] In our study ischemic heart disease was found in 34% of patients. This figure is closer to that reported by Al-Rajeh (33%).[7] Eight patients had mitral stenosis, five were female and three were male. All belonged to young age group. Ansari reported four patients of mitral stenosis, three female and one male in his study in young strokes.[20] High grade stenosis of extra cranial carotid artery is found in one fourth of ischemic strokes and is related to more cortical infarction.[23] In our study carotid artery stenosis was observed in 22% of cases. This is almost similar reported by Chang YJ et al (24.3%)[24] and higher found by Basharat (8%).[21] Recent studies show that low physical activity especially at work increases the risk of cerebral infarction.[25] Probably less active patients are obese and have increased chance of arteriosclerosis and ischemic strokes.

In this study many patients had low physical activity and they were living sedentary life (39 patients), which is higher than reported by Fayyaz M.[2] Family history of stroke was found in 12% of patients in our study which is slightly higher than reported in other studies.[26] Migrain, oral contraceptives, alcohol and sleep apnea are documented risk factors for cerebral infarction[27-30] but these were not found in our study. Stroke is a major contributor to total morbidity and mortality.

Stroke is a major contributor to total morbidity and mortality. In present study morality was 8%. This figure is much lower than 25% reported by Sheikh AA[31] and 34% reported by Marzban M.[32] 89% of our patients were still dependent for daily activities at the time of discharge from hospital.

CONCLUSION

Cerebral infarction accounts for 80 to 85 % of cases of stroke, which is a common neurological disorder. Major risk factors of cerebral infarction include hypertension, smoking, hyperlipidaemia, ischemic heart disease and physical inactivity, most of which are modifiable by proper education of the patients.

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