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AN EPIDEMIOLOGICAL STUDY OF PATIENTS WITH ACUTE ISCHEMIC STROKE

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ABSTRACT

Objective to study epidemiological risk factors in transient ischemic attacks, and acute ischemic stroke. This study was conducted on 100 cases of acute ischemic stroke in relation with epidemiology of risk factors. This study was conducted on 100 cases of acute ischemic stroke of both sex admitted in wards of department of General Medicine, Kamineni Institute of Medical sciences, of 2 years from October 2011 to September 2013. RESULTS: Out of 100 cases, the highest incidence of acute ischemic stroke was found in 51 to 60 years of age group; males were more 55% than females 45%. The most common risk factor was hypertension 57% and next being smoking 38%. Highest number of patients had increased triglycerides 47%, increased cholesterol 35%, LDL 15%, decreased HDL 56%. LVSD was found in 23% and 37% were having LVDD. Past history of stroke was found in 13.10%. It has been demonstrated in our study almost all patient with acute ischemic stroke had one or more risk factors and they have increased incidence of acute ischemic stroke as well as LVD which is forerunner of HF and sudden cardiac death that were asymptomatic, hence all acute ischemic strokes should be screened for risk factors and treated.

INTRODUCTION

Ischemic stroke is one of the cerebrovascular accidents (CVA). A stroke is defined as an abrupt onset of a neurological deficit that is due to a focal vascular cause [1]. Stroke is a worldwide health problem. It makes an important contribution to morbidity, mortality and disability in developed countries as developing countries. Although there are substantial difficulties in frequency from place to place, cerebral thrombosis is usually the most frequent form of stroke [2]. Cerebrovascular disease remains a leading cause of death from "non-communicable diseases" (NCD). Majority of these deaths occurred in people living in developing countries and 33.72% of the subjects were aged less than 73 years [3]. Stroke patients at highest risk of death in the 1st weeks, after the event, and between 20% to 50% die within the 1st month depending on the type, severity, age, co-morbidity and effectiveness of treatment of complications. Patients with history of stroke are at high risk of subsequent stroke around 10% in the 1st year and 5% year thereafter [4]. Although the prevalence of stroke appears to be comparatively less in India than in developed countries, it is likely to increase proportionately with increase in life expectancy. The proportion of stroke in the young population is significantly more in India than in developed countries [5]. The prevalence of stroke in India is about 1.4 per 1000 and death rate about 0.6 per 1000. The disability adjusted life year (DALY) lost is about 597.6 per lakh. The total number of stroke cases in India in the year 2004 was about 9.3 million with about 0.63 million deaths, and total DALYs lost in 2004 were 6.36 million [6]. Epidemiological studies have indicated that stroke does not

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occur at random, and there are risk factors, which precede stroke by several years like age [7, 8], blood pressure [9 - 11], Cigarette smoking [12], Diabetes mellitus [13], Dyslipidaemia [14], Atrial Fibrillation [15-17], Obesity and Metabolic syndrome [18-20] and Alcohol [21]. The present study was aimed to understand the epidemiological risk factors in transient ischemic attacks, and acute ischemic stroke.

METHODOLOGY

The present study was conducted in Kamineni Institute of Medical Sciences, Narketpally, Telangana over a period of 2 years between October 2011 to September 2013. During the study period, all the patients with acute ischemic stroke and fulfilling the inclusion criteria were included. Number of cases studies was 100. A written consent was taken from all the patients included in the study. Clearance was obtained from ethical clearance committee.

Inclusion Criteria

- All the patients with acute ischemic stroke confirmed by neurological examination and plain computerized tomography scan of brain were included in the study.

Exclusion Criteria

- Patients with haemorrhagic stroke.
- Patients with valvular heart disease.
- Patients with cerebral venous thrombosis.
- Patients with ischemic stroke due to altered haematocrit level and disturbed equilibrium in coagulation and fibrinolysis.
- Patients with those ischemic strokes due to central nervous system infections and auto immune vasculitis.

All patients had a thorough clinical, neurological examination with careful evaluation of history. Importance was given to symptoms and signs of cardiac disease in addition to neurological findings. The parameters taken for the study are age, sex, religion, lifestyle, hypertension both systolic and diastolic, diabetes mellitus, smoking, alcoholism, past history of CAD, past history of stroke and significant family history and drug history. Alcohol excess included patients who admitted to alcohol consumption allow the recommended allowances [21]. Hypertensives include all known or newly detected according to JNC7 criteria [22]. Diabetics include all known diabetics on treatment or newly detected cases satisfying American diabetes association criteria [23]. All the patients were subjected to ECG and a 2D-ECHO cardiograph for evaluation of left ventricular function as per standard guidelines [24,25].

METHODS

All the hundred patients with neurological dysfunction suggestive of ischemic stroke along with CT scan of brain showing ischemic infarct were subjected to complete blood count, complete urine examination, fasting blood sugar, 2hr post prandial blood sugar, blood urea, serum creatinine, serum uric acid, serum electrolytes, fasting lipid profile, liver function tests and fundoscopy.

RESULTS

The mean age of patients in the study group was 61.15 +/- 11.73 years; ischemic stroke was observed highest in the age group of 51 to 60 years , followed by 61 to 70 years and males were more in number than females, 55% and 45% respectively [Table1].

In present study, weakness was the most common symptom (88%) followed by deviation of angle of mouth (48%) and difficulty in speech (42%) [Table2].

In our study CT scan of the brain shows involvement of middle cerebral artery (MCA) in 81% of patients, MCA+ACA (anterior cerebral artery) in 7%, posterior cerebral artery (PCA) in 9% and Posterior inferior cerebral artery (PICA) in 3% of patients [Table3].

In the study group 57% patients had symptoms of cardiac disease and 18% were having dyspnoea of NYHA 1, and 12% had angina [Table4].

In present study, moat common risk factor was hypertension (57%), followed by smoking (38%), past history of CAD (12%) and ischemic stroke (12%) [Table5]. In our study the highest number of patients had increased triglycerides (47%), increased cholesterol (35%), increased Low density lipoprotein (15%) and decreased HDL (56%). In the present study 23% of the patients had left ventricular systolic dysfunction (LVSD) and 37% had left ventricular diastolic dysfunction.

Statistical Analysis

Left Ventricular Systolic Dysfunction (N=100)

Risk factor	Yes	No	Total	Chi^2	P
Smoking	15 (15%)	23 (23%)	38 (38%)	9.39	0.002
Alcohol	14 (14%)	17 (17%)	31 (31%)	12.5	0.000
Hypertension	15 (15%)	42 (42%)	57 (57%)	0.823	0.364
Diabetes mellitus	10 (10%)	14 (14%)	24 (24%)	6.21	0.013
Hypercholesterolemia	5 (5%)	29 (29%)	34 (34%)	2.0	0.157

Table 1. Age And Gender Distribution Of Patients With Acute Ischemic Stroke In The Study Group

Age Group	Males (N=55)	Females (N=45)	Total (N=100) Percentage
40-50 years	14	11	25%
51-60 years	16	12	28%
61-70 years	13	14	27%
71-80 years	10	08	18%
>/= 81 years	02	00	00
TOTAL	55	45	100%

Table 2. Clinical Features Of Neurological Dysfunction In Patients With Acute Ischemic Stroke In The Study Group

Presentation	No of Patients [N=100]	Percentage
Weakness	88	88
Deviation of Angle of Mouth	48	48
Difficulty in Speech	42	42
Convulsions	8	8
Sensory Symptoms	6	6
Involuntary Movements	2	2
Headache	12	12
Vertigo and Gait Imbalence	3	3
Altered Sensorium and LOC	15	15

Table 3: Plain Computerized Tomography Scan Of Brain Showing The Artery Territory Involved In Acute Ischemic Stroke Patients In The Study Group

Artery Territory	No of Cases [N=100]	Percentage
MCA	81	81%
MCA + ACA	7	7%
PCA	9	9%
PICA	3	3%
TOTAL	100	100%

Table 4. Clinical Features Of Cardiac Disease In Patients With Acute Ischemic Stroke In The Study Group

Presentation	Number of Patients [N=100]	Percentage
Angina	12	12%
Palpitations	07	07%
Dyspnea of NYHA -1	18	18%
Dyspnea of NYHA- 2	11	11%
Dyspnea of NYHA – 3	04	04%
Dyspnea of NYHA – 4	03	03%
Total	57	57%

Table 5. Risk Factor Profile In Patients With Acute Ischemic Stroke In The Study Group [N=100]

Risk factors	No of Cases	Percentage
Smoking	38	38%
Alcoholic	31	31%
Hypertension	57	57%
Diabetes	24	24%
Past History of CAD	12	12%
Past History of Ischemic Stroke	12	12%

DISCUSSION AND CONCLUSION

The mean ages of patients with acute ischemic stroke in earlier studies were 63+/-5.98 years, and 59.40+/-12.15 years [26, 27]. In present study it 61.15+/-7.73 years which is similar to their studies. Sex distribution in present study was 55% were male and 45% were female are in agreement with earlier authors where they found 57% male 43% female and 52.3% male, 47.7% female respectively [27, 28]. Our study is similar to their study. The percentage of sex in NOMA study was 44% males and 56% females.

The higher incidence of stroke in women in NOMA study could be due to the associated habits of smoking and alcohol intake in western women [30].

Earlier study has stated that 25% of all strokes are directly related to cigarette smoking which independently increases the relative risk of stroke about three times (75%) [12]. He has also stressed that the risk is dependent upon the amount of cigarette smoked for subtypes of strokes, consistently and strongly for sub-arachnoid hemorrhage and cortical ischemic stroke caused by arterial atheroembolism, in the present study the incidence of smoking was 38% which is lower than the earlier studies [12], it is explained by exclusion of SAH in our study.

In present study 31% of patients have found to have consumed excess alcohol which is similar to the earlier study [31] where in 33% and 29% of patients had excess alcohol respectively. In the present study 34% of the patients with acute ischemic stroke and hyper cholesterol, which was similar to earlier studies [30, 32] where in 38% and 32% were found high cholesterol respectively.

In our study 57% of patients were hypertensive are in accordance with earlier studies where hypertensive was 55.5% and 59.1% respectively, which is similar to our study [29, 33]. The percentage of patients with diabetes in present study was 24 and similar observation was also seen in earlier studies where 24.4 and 23.1 respectively [33,34], which was similar to our study. Patients with acute ischemic stroke having suffered from coronary artery disease were 12% in the present study which was in comparison with earlier studies [29, 35].

Earlier studies showed that patients with acute ischemic stroke who has previous history of stroke were 13.1 % and 15% [29, 31] and in present study it was 12%, which is similar to their study. Out of 100 patients in the present study neurological deficits like weakness was found in 88% and difficulty of speech was in 42% of the patients. Earlier studies showed that 92.10% and 60% as well it was 96.20% and 45.5% and our study correlates with their study [31, 36]. Left ventricular systolic dysfunction in acute ischemic stroke in present study was 23% which was similar to the earlier studies where 24.1% had LVSD [31, 35]. In the present study 22.45% and 37% of acute ischemic stroke had LVDD; these observations are in accordance with earlier studies [29, 37].

To conclude, our study demonstrates almost all patient with acute ischemic stroke had one or more risk factors and they have increased incidence of acute ischemic stroke as well as LVD which is forerunner of HF and sudden cardiac death that were asymptomatic, hence all acute ischemic strokes should be screened for risk factors and treated.

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