

An Observation of Risk Factors Associated with Patients with Ischemic Stroke.

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ABSTRACT

Background: Objective: our study was to observe the risk factors in different age group of patients with ischemic stroke. **Methods:** A total of 120 patients of ischemic stroke were considered on the basis of detail clinical history, laboratory findings and CT Scan/MRI. **Results:** Data was analyzed by using MS-Office software. **Conclusion:** Major risk factors associated with ischemic stroke was hypertension, smoking, alcohol consumption, diabetes mellitus, dyslipidemia and obesity.

Keywords: ischemic stroke, risk factor.

INTRODUCTION

Stroke has been defined as acute loss of focal and at times global (applied to patient in deep coma and to those with subarachnoid hemorrhage) cerebral function; the symptoms lasting for more than 24 hours or leading to death and with no apparent cause other than vascular origin. It is not a diagnosis but a clinical syndrome with numerous causes.^[1] The main types of stroke are ischemic and hemorrhagic.

ischemic attack, and other cardiac disorders.^[4] These are all potentially treatable conditions that predispose to stroke. Though the mortality of stroke has been on the decline still it represents the most common cause of chronic disability posing a major social and financial challenge to the community.^[5] Aim of our study was to observed the frequency of association of various modifiable and non modifiable risk factors with ischemic stroke in different age group.

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Defining stroke types helps in determining the most effective therapy and is clearly related to prognosis. Computed tomographic and magnetic resonance imaging should be performing to confirm the type of stroke.^[2,3] The main goal of treatment is to maximize physical and cognitive function by limiting acute complications and facilitating rehabilitation.

In the past several decades many studies have successfully identified non modifiable risk factors for ischemic stroke such as age, gender, race, ethnicity, heredity and several well established modifiable risk factors such as hypertension, atrial fibrillation, dyslipidemia, diabetes, cigarette smoking, physical activity, carotid stenosis, transient

MATERIALS AND METHODS

A total of 120 subjects with age of 20 years to > 50 years were included in this study. The attendant of entire subject signed an informed consent approved by institutional ethical committee of Katihar Medical College, Katihar, Bihar, India was sought. Data was collected on the basis of inclusion and exclusion criteria, with irrespective of sex in OPD or the ward, of department of Medicine, Katihar Medical College, Katihar, Bihar, India, during period of September 2015 to February 2016.

Detail history, neurological examination and related investigation (CT scan or MRI brain to establish the diagnosis of stroke) were taken to all stroke patients. Risk factors and their age of onset were studied. Inclusion criteria of our study were the patients of ischemic stroke with age group 20 years to greater than 50 years. And exclusion criteria were patients

below the 20 years, Patients with other form of stroke like intracranial or subarachnoid hemorrhage. Data were recorded like, Diabetes mellitus, Sex of the patient, Ethnicity, Presence of hypertension, Association with smoking, Presence of dyslipidemia, Presence of obesity, Presence of heart disease, Alcohol consumption, Level of physical activity, Socioeconomic status, State of mental health, Past history of TIA, Family history of stroke or early CAD, Dietary habits, Medical illness, Post menopausal, Drugs, Migraine, High altitude exposure in previous one month and Trauma. Hypertension were consider to have hypertension, if they had the diagnosis of hypertension as per JNC-7 criteria (stage I hypertension as systolic blood pressure between 140-159 mmHg and diastolic blood pressure between 90-99 mmHg, stage II hypertension as systolic blood pressure > 160 mmHg and diastolic blood pressure 100 mmHg or more and were treated for hypertension before stroke. Patients with stroke who had transient hypertension resulting from increased intracranial pressure (cushing reflex) who did not receive anti hypertensive treatment at the time of dismissal were not considered to have hypertension.

Diabetes mellitus was considered, when subjects give history of diabetes mellitus and are on diet/oral hypoglycemic drugs or received insulin treatment or had random blood sugar > 200 mg/dl with complications of diabetes, fasting plasma glucose of more than 125 mg/dl or Hb A1c more than 6.5 %.

Smoking: A person who is smoked 100 or more cigarettes during his life time is considered as a smoker. A current smoker is defined as a person who smoked at least one cigarette per day for the preceding three months or more or had tobacco in any form. Never smoker, a person who does not meet the criteria for a current smoker or ex-smoker.

Dyslipidemia: Dyslipidemia is defined when a patient has a diagnosis of it, and/or is on diet or lipid lowering agents or has fasting blood cholesterol > 200 mg/dl, triglycerides > 180 mg/dl, LDL > 100 mg/dl during hospital stay.

Cardiovascular causes: Patients were considered to have a cardiac abnormality, when they had a self reported history of myocardial infarction, coronary artery bypass grafting, angina or percutaneous transluminal angioplasty. The 12 lead ECG of each patient was recorded. The presence of high QRS voltage i.e sum of S wave in V1 lead and R wave in V5 or V6 lead of 35 mm or more was considered evidence of left hypertentricular hypertrophy. ECG evidence of possible or definite myocardial ischemia i.e. 1 mm depression of ST segment or myocardial infarction by presence of Q/QS pattern was to be noted and atrial fibrillation if any were documented.

Family history:

A positive family history was too considered if a patient had first-degree relative (parent or sibling) who had a stroke/TIA.

Obesity:

Obesity, defined as patient with BMI > 30 Kg/sqm.

Socioeconomic status:

Patients were divided into three income groups (INR): poor less than 15000/-, middle: 15000-50000/-, and rich: >50000/-.

Dietary habits: patients were considered as, vegetarian, non- vegetarian and mixed (both vegetarian and non vegetarian).

TIA: It was defined as focal neurological deficit of sudden onset with complete recovery within 24 hours.

Physical activity: physical activity was divided into, mild, moderate and severe. Mild physical activity was defined as activity confined to bed, requires assistance of others for activity of daily living or walking only few steps. Moderate physical activity was considered as being able to do normal activity and outdoor activities without physical assistance or discomfort. Severe physical activity was restricted top athletes, recruits and patient requiring strenuous manual labor.

Statistical Analysis:

Data was analyzed by using of simple statistical method with the help of MS-Office software.

RESULTS

Study was done in Katihar Medical College, Katihar, Bihar, India during period of September 2015 to February 2016. A total of 120 subjects with age group 20 years to greater than 46 years were selected for this study. Male and female ratio was 97:23 (N=120, male: 97, female: 23).

In this study, age group 20 to 32 years, there were 5 male and 1 female. Total percentage was 5 %. In age group 33 to 45 years, we were taken 12 male and 2 female. Total percentage was 14 (11.66 %). In age group ≥46 years, male was 80 and female was 20. And total percentage was 100(83.33%).

Out of 120 patients, 50(41.67%) patients was monthly income less than 15,000/- Indian rupees. 66 (55%) patients were monthly income between 15,000/- to 50,000/- Indian rupees. And 4 (3.33%) patients were monthly income greater than 50,000/- Indian rupees. That means majority of stroke patients were belong from medium socioeconomic status.

Table 1: Risk factors associated with ischemic stroke.

Risk factors	No. of patients	Percentage
Diabetes mellitus	30	25%
Hypertension	95	79.17%
Smoking	50	41.67%
Dyslipidemia	20	16.67%
Alcohol	48	40%
Family history of stroke	8	6.67%
Family history of CAD	19	15.84%
Coronary heart disease	18	15%
AF	7	5.83%
Past history of TIA	5	4.17%
Past history of stroke	12	10%
Obesity	14	11.67%
Migraine	7	5.83%
Trauma	0	0
High altitude	0	0
Post menopausal	22	18.34%

Out of 120 patients, 30(25%) patients were risk factor diabetes mellitus. 95(79.17%) patients were risk factor hypertension. 50(41.67%) patients were smoker. 20(16.67%) patients were the history of dyslipidemia. 48(40%) patients were alcoholic. 8(6.67%) patients were the family history of stroke. 18(15%) patients were the history of coronary heart disease. 7(5.83%) patients were atrial fibrillation (AF). 5(4.17%) patients were the history of transient ischemic attack(TIA). 12(10%) patients were the past history of stroke. 14(11.67%) patients were the risk factor of obesity. 7(5.83%) patients were the history of migraine. 22(18.34%) patients were the post menopausal. And there was no history of trauma and high altitude FOR stroke patients our study.

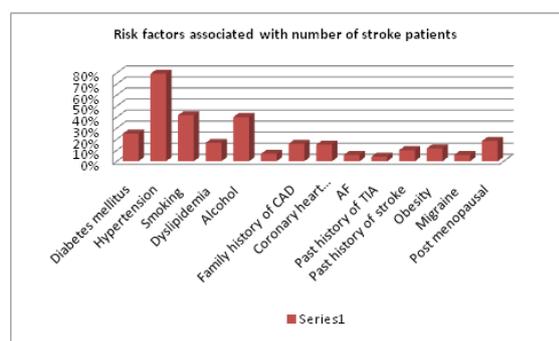


Figure 1: Risk factors associated with ischemic stroke.

In out of 120 patients, 26(21.67%) patients were performed the mild physical activity. 86(71.67%) patients were performed the moderate physical activity. And 8(6.67%) patients were the past history of severe physical activity.

Table 2: Physical activity as a risk factor associated with ischemic stroke.

Physical activity	Mild	Moderate	Severe
No of patients	26	86	8
percentage	21.67%	71.67%	6.67%

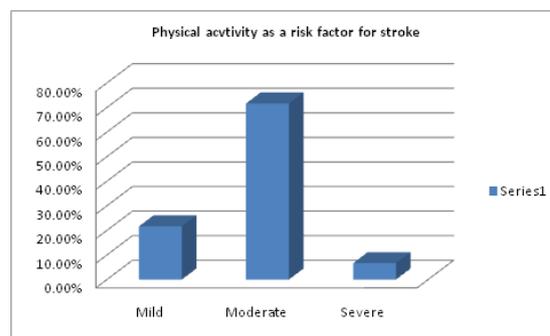


Figure 2: Physical activity as a risk factor associated with ischemic stroke.

DISCUSSION

Stroke is an important public health problem and a burden to community and health care providers. It is the third most common causes of death after ischemic heart disease and cancers not only in developed countries but worldwide. Stroke occurs predominantly in middle and late years of life. Several line of evidence suggests that hypertension, diabetes mellitus, hyperlipidemia, ischemic heart disease, atrial fibrillation, smoking and carotid stenosis are contributing factors for stroke. The prevalence of risk factors varies in different countries. Despite numerous prior studies of stroke risk factors, much remains unknown and several inconsistencies continue to exist. However, the minor differences in the prevalence of stroke risk factors in different communities are probably due to differences in culture, disease patterns, living habits and distribution of various ethnic groups.

Different risk factors were recorded and analyzed for their association with ischemic stroke. Among the non-modifiable risk factors, age and sex were studied. Elderly people are the most vulnerable group for developing stroke. In this study it was seen that 83.33 % (n=100) of the sufferers were in the age group 46 years and above and incidence increase with increasing age as depicted in the bar graph. No case was recorded below the age of 20 years. Only 5% case was recorded of stroke with age group 20 to 32 years. So it clears from this study that ischemic stroke occurs more commonly in elderly. And male was more affected than female. The higher male preponderance in this study may also be due to the fact that women are neglected part of the society and they are not brought to hospital if not otherwise seriously ill. This needs to be corroborated with studies conducted in other service institutes.

Socioeconomic basis of stroke people was studied. It showed that middle class people which were

considered in the income group between INR 15000-50000/-per month were the most sufferer (n=66, 55%). This study correlates with that of Chapman et al.^[6] From this study we get the impression that poor and rich are less sufferer from stroke. But this may not be true in case of poor as many of the patients are not brought to the hospital. So the actual trend of incidence might be different.

In this study, hypertension emerges as the most important and common risk factor for ischemic stroke (n=95, 79.17%). The results correlate with that of study in urban population in Calcutta 2001, where hypertension was found to be most important risk factor.^[7]

Diabetes mellitus has been long recognized as a risk factor for vascular disease. It doubles the risk of stroke compared with non-diabetes. In this study, diabetes appears to be associated with stroke in about 25% population. 10-14% cases of stroke are attributable to diabetes was found in Framingham study. The highest prevalence seen in our study may be due to higher prevalence of diabetes in southern India from where most of the population under study hails. The data is in agreement with several other India studies.^[8]

Smoking appears as an important risk factor for ischemic stroke in this study. 50(41.67%) patients with ischemic stroke were smokers. This study correlates with Donnan et al, who found smoking as a strong risk factor for cerebral infarction.^[9]

19 (15.84%) had a concomitant CAD and 7 (5.83%) patients had past history of AF which acted as a potential source of cerebral embolism. So it was obvious from this study that any finding suggestive of underlying heart disease in a stroke patient should raise the suspicion of ischemic stroke.

A total of 5 (4.17%) patients had previous history of stroke or TIA. Actually TIA is a major risk factor for disabling stroke. Previous study was showed that TIA was 13 fold increased risk of stroke.^[10]

Hypercholesterolemia and various lipoproteins fraction have been clearly associated with the severity of carotid atherosclerosis. Still the serum cholesterol stroke association remains an enigma. It varied between 22% to 29% in the western series.^[11,12] In our study the association of dyslipidemia with ischemic stroke was found to be 16.67% (n=20).

48 (40%) patients were found to be alcoholic. For cerebral infarction chronic heavy drinking and acute intoxication have been associated with an increase risk among young adults.^[13] In older adult risk is increased among heavy drinking men. Some studies have supported as a J-shaped dose- response curve between alcohol intake and ischemic stroke risk, with protection for those drinking up to 2 drinks per day and an increased for those drinking > 5 drinks per day compared with nondrinkers.^[14] The dose-response relationship between alcohol and stroke is consistent with the observed deleterious and

beneficial effects of alcohol. The deleterious effects of alcohol for stroke may occur through various mechanisms, including increasing hypertension, hypercoagulable states and cardiac arrhythmias and reducing cerebral blood flow. However, there is also evidence that light –to- moderate alcohol intake can reduce the risk of coronary artery disease, increased HDL cholesterol, and increased endogenous tissue plasminogen activator. The limitation of the study was that the daily quantity and the type alcohol could not be specified.

11.67% (14) patients were obese. Obesity (defined as a body mass index [BMI] ≥ 30 Kg/m²) predisposes to cardiovascular disease in general and to stroke in particular. However, obesity prevalence increases with advancing age and obesity is associated with increased blood pressure, blood sugar and blood lipids. On the basis of these associations alone it is not surprising that obesity would be related to an increased risk of stroke. However, several large studies suggest abdominal obesity rather than BMI or general obesity is more closely related to stroke risk. In women, obesity was associated with an increased risk of ischemic stroke with increasing level of BMI. Weight gain after the age of 18 years was also related to ischemic stroke with increasing weight associated with increasing stroke risk.^[15] Thus, recent evidence supports abdominal obesity in men and obesity and weight gain in women as independent risks factors for stroke. Weight reduction in over weight person is recommended on the basis of the associated increase in co-morbid conditions that can lead to stroke.

Future Research:

Science is dynamic and there is always a scope of improvement and change in time to come ahead. With progressive aim to move ahead, we aspire to achieve highly accurate and reliable results. Thus, every study leaves back scopes for other researcher to do something more advanced and varied in order to touch the height of perfection. This study examined only 120 subjects (97 male and 23 female), future researchers can expand the study by including more number of subjects so as to make generalization of the results and practice, further studies with a larger sample size and in multiple centers are required. Thus, it could be applied to real life situation.

Relevance to clinical practice:

This study is relevant to the high incidence of risk factor for patients with ischemic stroke. It opens up new possibilities of prevention of stroke and makes maintain the good health of population. Such knowledge in future would not only reduce this disease but also have significant medical benefits on the health care systems.

CONCLUSION

Common risk factors of ischemic stroke were hypertension, smoking, alcohol consumption and obesity. And less common risk factors were dyslipidemia, post menopausal, coronary artery disease, coronary heart disease, past history of TIA, migraine and family history of stroke. Hence, we should act on Target of these risk factors for prevention of cerebrovascular accidents to reduce the burden of this disabling disease.

Limitation:

There were several limitations like, the sample size was small, and it was a hospital-based study, the prevalence of risk factors may be different from a different community setting.

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