

# A Study of Risk Factors of Cerebrovascular Accident at a Tertiary Care Centre in Western U.P.

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## ABSTRACT

**Background:** A stroke or CVA is defined by the abrupt onset of a neurologic deficit that is attributable to a focal vascular cause. Important modifiable risk factors include diabetes, hypertension, smoking, alcohol intake, sedentary life style, dyslipidemia, heart disease and OCP intake in females and non-modifiable risk factors include old age, gender predisposition and family history. The aim of study is to determine the types of stroke and presenting clinical features and modifiable and non-modifiable risk factors associated with development of stroke. **Methods:** The present study is a prospective observational study conducted in Teerthanker Mahaveer Medical College over a period of one year i.e January 2017 to January 2018. Total 110 cases presenting with stroke were included in the study. **Results:** The study shows that ischemic stroke is commoner than hemorrhagic stroke. The risk of stroke increases with age and common in males. Diabetes mellitus was seen in 29.1% cases presenting with stroke, 39.1% cases had hypertension. 43.6% and 22.7% were smokers and alcoholic respectively. Dyslipidemia was present in 37.3% cases. 15.4% cases had history of heart disease. 17.2% cases had previous history of stroke. **Conclusion:** The modifiable risk factors pose a huge burden by increasing the morbidity and mortality due to stroke. Proper control of these risk factors can reduce the burden of disease.

**Keywords:** CVA (cerebrovascular accident), diabetes, hypertension, TIA (transient ischemic attack).

## INTRODUCTION

A stroke or CVA is defined by the abrupt onset of a neurologic deficit that is attributable to a focal vascular cause.<sup>[1]</sup> It is one of the leading cause of disability and death worldwide among adults.

The risk factors associated with stroke can be divided into modifiable and non-modifiable. Important modifiable risk factors include diabetes, hypertension, smoking, alcohol intake, sedentary life style, dyslipidemia, heart disease and OCP intake in females. Non modifiable risk factors include old age, gender predisposition and family history.

The modifiable risk factors pose a huge burden in the etiology of stroke and if controlled properly can reduce the risk of developing stroke thereby reducing the morbidity and mortality. The present study was conducted to know various risk factors associated with stroke in the study population and plan preventive strategy to reduce its burden of the disease.

## Aim

1. To determine the types of stroke and presenting clinical features in the study population.
2. To study various modifiable and non-modifiable risk factors associated with development of stroke in the study population.

## MATERIALS AND METHODS

The present study is a prospective observational study conducted in Teerthanker Mahaveer Medical College over a period of one year i.e January 2017 to January 2018. Total 110 cases presenting with stroke were included in the study.

Detailed history was taken with special emphasis to assess the risk factors associated with stroke like smoking, alcohol intake, H/O diabetes, hypertension, dyslipidemia, transient ischemic attack, previous episode in past. General physical and systemic examination was carried out. Investigations like CBC, RBS, lipid profile, KFT, ECG and CT head were done in every patient.

The data was entered in excel sheet and descriptive analysis of the data was done.

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## RESULTS

**Table 1: Distribution of cases depending on type of stroke.**

| Type of stroke | Number | Percentage |
|----------------|--------|------------|
| Ischemic       | 68     | 61.8%      |
| Hemorrhagic    | 42     | 38.2%      |

The above table depicts that amongst the cases presenting with stroke majority of them had ischemic stroke i.e 61.8% followed by hemorrhagic stroke in 38.2%.

**Table 2: Non modifiable risk factors.**

| Age wise distribution    |        |            |
|--------------------------|--------|------------|
| Age(in years)            | Number | Percentage |
| <40                      | 21     | 19.1%      |
| 41-60                    | 37     | 33.6%      |
| >60                      | 52     | 47.3%      |
| Gender wise distribution |        |            |
| Male                     | 67     | 60.9%      |
| Female                   | 43     | 39.1%      |
| Family history           |        |            |
| Present                  | 14     | 12.7%      |
| Absent                   | 96     | 87.3%      |

On analyzing the non-modifiable risk factors of stroke majority of the cases were in the age group of more than 60 years i.e 47.3% followed by 41- 60 years in 33.6%, occurrence of stroke was more commonly seen in males (60.9%) than females (39.1%). Family history of stroke was seen in 12.7% cases.

**Table 3: Modifiable risk factors.**

| Risk factors          | Number | Percentage |
|-----------------------|--------|------------|
| Diabetes              | 32     | 29.1%      |
| Hypertension          | 43     | 39.1%      |
| Smoking               | 48     | 43.6%      |
| Alcohol intake        | 25     | 22.7%      |
| Dyslipidemia          | 41     | 37.3%      |
| Heart disease         | 17     | 15.4%      |
| Recurrent stroke/ TIA | 19     | 17.2%      |

The above table depicts that diabetes mellitus was seen in 29.1% cases presenting with stroke, 39.1% cases had hypertension. 43.6% and 22.7% were smokers and alcoholic respectively. Abnormal lipid profile was present in 37.3% cases. 15.4% cases had history of heart disease. 17.2% cases had previous history of stroke.

**Table 4: Presenting clinical features.**

| Clinical feature   | Number | Percentage |
|--------------------|--------|------------|
| Sensorium          |        |            |
| Conscious          | 43     | 39.1%      |
| Drowsy             | 54     | 49.1%      |
| Coma               | 13     | 11.8%      |
| Hemiparesis        |        |            |
| Right              | 51     | 46.4%      |
| Left               | 59     | 53.6%      |
| Facial weakness    |        |            |
| Right              | 12     | 10.9%      |
| Left               | 17     | 15.4%      |
| Speech defect      | 49     | 44.5%      |
| Glasgow Coma scale |        |            |
| <5                 | 13     | 11.8%      |
| 6-10               | 43     | 39.1%      |
| 11-15              | 54     | 49.1%      |

On assessing the sensorium of the patients at the time of admission 39.1%, 49.1% and 11.8% cases presented in conscious state, drowsiness and coma respectively. Left sided hemiparesis (53.6%) was more commonly seen than right sided hemiparesis (46.4%). Left sided facial weakness (15.4%) was slightly more than right sided facial weakness (10.9%). Speech defect was seen in 44.5% cases. The GCS of cases getting admitted with CVA in 11.8% cases was less than 5, between 6 to 10 in 39.1% cases and 11-15 in 49.1% cases.

## DISCUSSION

Our study shows that ischemic stroke (61.8%) is more common than hemorrhagic stroke (38.2%) similar to other studies.<sup>[2,3]</sup> On analyzing the non-modifiable risk factors of stroke, incidence of stroke increased with age, more common in males (60.9%) than females (39.1%). Similar results have been seen in various studies which show that incidence of stroke increased with age and is more common in men than in women globally.<sup>[4-7]</sup> Family history of stroke was seen in 12.7% cases. The increased risk of stroke in members with family history of cerebrovascular accident has been seen in a study done in 2007.<sup>[8]</sup>

On analyzing the modifiable risk factors it was seen that diabetes mellitus was present in 29.1% cases presenting with stroke. A study done by Burchfield et al shows that diabetes is an independent risk factor in development of ischaemic stroke.<sup>[9]</sup> Similar result has been seen by Strauss et al.<sup>[10]</sup> 39.1% cases presenting with stroke had hypertension. In a study done by Pathak et al hypertension as a risk factor of CVA was present in 60% cases which is higher than the present study.<sup>[11]</sup>

In the present study 43.6% cases presenting with stroke were smokers. A metaanalysis has shown that cigarette smoking increases risk of ischemic stroke nearly two times.<sup>[12]</sup> 22.7% cases of stroke were give history of alcohol intake. The association between alcohol consumption and risk of ischemic stroke is J-shaped with the lowest risk among those consuming less than 12 g/day and the highest risk among those consuming more than 60 g/d. Relative risk of hemorrhagic stroke increases linearly with increasing alcohol consumption.<sup>[13]</sup>

Abnormal lipid profile was present in 37.3% cases. Various studies have shown that dyslipidemia is a risk factor for development of stroke.<sup>[14-17]</sup>

In 15.4% cases there was history of heart disease. In the Framingham study the risk of stroke was increased twofold by coronary artery disease, three fold by electrocardiographic left ventricle hypertrophy and three to four fold by cardiac failure. Mitral stenosis increases the risk for stroke. The presence of atrial fibrillation and annular calcification of valve, increased risk of stroke by fivefold compared with doubling in stroke risk with

either factor present alone.<sup>[18]</sup> 17.2% cases had previous history of stroke or transient ischaemic attack. Study done by Howard et al also shows that TIA is a significant risk factor for development of stroke.<sup>[19]</sup>

## CONCLUSION

The present study shows that most important modifiable risk factors for development of stroke are diabetes mellitus and hypertension and age is the major non modifiable risk factor. These modifiable risk factors pose a huge burden by increasing the morbidity and mortality due to stroke. Proper control of these risk factors can reduce the burden of disease.

## REFERENCES

1. Powers AC. Harrison's Principles of Internal Medicine, 18th edition Cerebrovascular Accident. Maryland Baltimore: The McGraw Hill Companies; 2012; 338:2275-304.
2. Lindsay KW, Bone I, Callander R. Neurology and Neurosurgery illustrated. 4th ed. Edinburgh: Churchill Livingstone; 2004: 238-97.
3. Smith WS, Johnston SC, Easton DE, Kasper DL, Braunwald E, Fauci A, Hauser SL, Longo DL, Juneson JL. Harrison's Principles of Int. Medicine 16th ed. New York: McGraw Hill; 2005 p 2372-2393.
4. Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation as an independent risk factor for stroke: the Framingham study, 1991. Aug; 22(8):983-8.
5. Wasay M, Khatri IA, Kaul S. Stroke in South Asian countries. Nat Rev Neurol. 2014; 10:135-43.
6. Appertos P, Stegmayr B, Terent A. Sex differences in stroke epidemiology: A systemic review. Stroke. 2009 Apr; 40(4):1082-90.
7. Sacco RL, Benjamin EJ, Broderick JP. Risk factors Stroke 1997; 28:1507-1517.
8. Dichgans M. Genetics of ischaemic stroke. Lancet Neurol. 2007; 6:149-161.
9. Burchfield CM, Curb JD, Rodriguez BL, Abbott RD, Chiu D, Yano K. Glucose intolerance and 22 year stroke incidence. The Honolulu Heart Program. Stroke. 1994; 25(5):951-7.
10. Straus SE, Majumdar SR, Mc Alister FA. New evidence for stroke prevention. JAMA 2002; 288(11):1388-1395.
11. Pathak V, Kanth R, Pant. Stroke: A case series in Nepal Medical College Teaching Hospital. Nepal Med Coll J 2006; 8(3):180-1.
12. Shinton R, Buvers G. Metaanalysis of relation between cigarette smoking and stroke. BMJ, 1989; 298:789-94.
13. Reynolds K, Lewis LB, Nolen JDL, Kinney GL, Sathya B, He J. Alcohol consumption and risk of stroke. JAMA, 2003; 289: 579-588.
14. Sarkar TK, Kuddus MR, Khan MR, Anwar Ullah AKM, Islam MR, Haque A. Dyslipidemia in Cortical versus Subcortical Infarction. Bangladesh Journal of NeuroScience. 2008; 24(1):24-33.
15. Lisovsky F, Rousseaux P. Cerebral infarction in young people: A study of 148 patients with cerebral angiography. J Neurol Neurosurg Psychiatry. 1991; 54:576-7
16. Jadhav YL, Bondarde SA. Study of risk factors and Clinical Profile of stroke in Young Adults. MVP Journal of Medical Sciences. 2015; 2(1):15-9.
17. Shahar E, Chambless LE, Rosamond WD, Boland LL, Ballantyne CM, McGovern PG. Plasma lipid profile and Incident ischemic stroke. Stroke. 2003; 34(3):623-31.
18. Benjamin EJ, Levy D, Vaziri SM, D'Agostino RB, Belanger AJ. Independent risk factors for atrial fibrillation in a population based cohort. The Framingham Heart Study. JAMA 1994; 16; 271(11):840-4.
19. Howard G, Evans GW, JR Crouse, JK Toole, JE Ryu, C Tegeler, J Fyre Pierson, E Mitchell and L Sanders. A prospective reevaluation of TIA as a risk factor for death and fatal or non fatal cardiovascular events. 1994; 25:342-5.

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