

## A STUDY TO EVALUATE THE MOST PREVALENT CAUSES OF ISCHEMIC STROKE AND ITS PROGNOSIS

Satyendra Kumar<sup>1</sup>

<sup>1</sup>Assistant Professor, Department of Neurosurgery, Anugrah Narayan Magadh Medical College and Hospital, Gaya, India.

Received : 05/10/2022  
Received in revised form : 02/11/2022  
Accepted : 14/11/2022

**Keywords:**

Hypertension, Dyslipidaemia, Alcohol Intake, Stroke; Risk Factors; Prognosis.

Corresponding Author:

**Dr. Satyendra Kumar,**  
Email: drskumar99@gmail.com  
ORCID: 0000-0002-7407-8244

DOI: 10.47009/jamp.2022.5.1.134

Source of Support: Nil,  
Conflict of Interest: Nondeclared

*Int J Acad Med Pharm*  
2023; 5 (1); 641-644



### Abstract

**Background:** Stroke is the second most common cause death after heart disease worldwide. Clinical expression of stroke is extremely variable. **Aim:** To evaluate the most prevalent causes of ischemic stroke and its prognosis. **Materials and Methods:** A comprehensive clinical history, extensive physical examination, and appropriate investigations were performed in 50 patients with ischemic stroke who met the inclusion criteria. Their prognosis was also evaluated throughout their hospital stay. **Result:** The incidence of stroke in males was more compared to females. The incidence was more in age 60 years and above. The most common modifiable risk included- smoking, hypertension, dyslipidemia, alcohol, diabetes mellitus, cardiac disorders, tobacco chewing and a family history of stroke. **Conclusion:** Habits and life style diseases are the most common modifiable risk factors in ischemic stroke. Modifying the risk factors with concurrent preventive measures may reduce the risk of mortality and morbidity.

## INTRODUCTION

Stroke is the second most common cause death after heart disease worldwide. This is also reported to be the third most common cause of death in some studies, following heart disease and cancer.<sup>[1]</sup> In India, the prevalence of hemiplegia is in the range of 200 per one lacs. This also accounts for nearly 1.5 percent hospital admission, 4.5% of all medical admission and includes roughly 20% of all neurological cases in urban areas.<sup>[2]</sup>

In recent decades, the survival rate after stroke has increase due to technological advancement, and therefore, has shifted to the principal cause of long-term disability instead of death. Strokes often prevent patients from regaining their position in family and their capacity to return to work place. The extent of disability most often require full-time caretaker. Recurrent stroke exacerbate cognitive impairments and produces dementia.<sup>[1]</sup>

The patient of stroke, utilizes an ample amount of health care costs, due to high incidence of stroke and its treatment cost. Therefore, it becomes an important determinant of health budget either for the family or government or health insurance company. The high treatment cost as well as subsequent loss of productivity in patients with stroke warrants to emphasize the preventive measures as an cost effective alternative.<sup>[1,3]</sup>

The clinical expression of stroke is extremely variable owing to the complex anatomy of the brain and its vasculature.<sup>[4]</sup>

Therefore, this study was conducted to evaluate the most prevalent causes of ischemic stroke and its prognosis.

## MATERIALS AND METHODS

This prospective, observational, unicentric study was conducted at Department of Neurosurgery, at Anugrah Narayan Magadh Medical College and Hospital, Gaya. The study was conducted over a period of 2 years from June 2020 to May 2022. The study was approved by the institutional research and ethical committee. An informed and written consent was obtained from the participating subjects before the commencement of the study.

The study sample consisted of ischemic stroke patients who were admitted in the intensive care unit of our institute. The diagnosis of Ischemic stroke was made based on – acute loss of focal or global cerebral function clinically and evidence of ischemia CT scan of head.

A total of 130 patients meeting the inclusion and exclusion criteria were enrolled for the study.

### Inclusion Criteria

Patients with the evidence of ischemic stroke.

### Exclusion Criteria

Focal epilepsy, migraine, and tumors. Patients with evidence of hemorrhage on CT scan of head or stroke secondary to infection and connective tissue disorders.

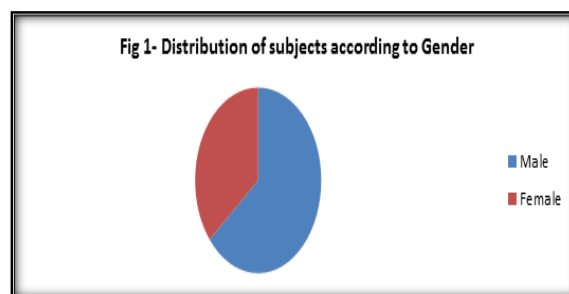
### Procedure

A detailed clinical history and physical examination was carried out for the recruited subjects. For the subjects with altered speech, the history was gained from the attendant. Further a detailed routine lab investigation was carried out, which included- Complete blood count, Urine analysis, and Fasting and post prandial blood sugar, Blood urea, Serum creatinine, Lipid profile, Electro cardiogram (ECG), 2D-Echo with Color Doppler, Computed Tomography (CT scan). The prognosis of the patient was evaluated in reference to the outcome as- Complete recovery, Partial recovery, No recovery, Death. The data was tabulated in Microsoft excel spread sheet, and the data was subjected to statistical analysis using SPSS Software, Version 20.0.

## RESULTS

The present study evaluated the most prevalent causes of ischemic stroke and its prognosis. A total

of 130 cases were enrolled, of which only 100 subjects were available till the final study record. This shows a response rate of 76.93 %. The distribution of subjects according to gender and prognosis is shown in [Figure 1].



**Figure 1: Distribution of subject according to Gender**

The distribution of subjects according to gender and prognosis is shown in table 1. Of the 100 study subjects, 64 subjects were male, while only 36 were female. This shows a male an increased incidence of ischemic stroke in males. Of the 64 males 10 recovered completely, 24 recovered partially, 24 could not recover and 08 expired. Similarly, of the 36 females, 06 recovered completely, 06 recovered partially, 16 could not recover and 04 expired.

**Table 1: Gender distribution of subjects according to prognosis.**

	Total	Complete Recovery	Partial Recovery	No Recovery	Expired
Male	64	10	24	24	8
Female	36	6	6	16	4

The distribution of subjects according to age and prognosis is shown in table 2. The enrolled subjects were grouped at an interval of 10 years. The enrolled subjects were grouped into 20 -29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years and 70 years or more age groups. The distribution of subjects in the different age groups were as follows. 08 in 20 -29 years, 10 in 30-39 years, 14 in 40-49 years, 20 in 50-59 years, 34 in 60-69 years and 14 in 70 years or more age groups. The complete recovery was seen in 4, 2, 2, 2, 6, and 0 subjects in the 20 -29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years and 70 years or more age groups respectively. A partial recovery was seen in 2, 6, 4, 6, 8, and 4 subjects in the 20 -29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years and 70 years or more age groups respectively. 02 in 20 -29 years, 02 in 30-39 years, 04 in 40-49 years, 02 in 50-59 years, 14 in 60-69 years and 10 in 70 years or more age groups could not survive. The number of expired subjects in 20 -29 years and 30-39 years age range were 0. While it was 4, 2, 4 and 4 in 40-49 years, 50-59 years, 60-69 years and 70 years or more age groups.

**Table 2: Age distribution of subjects according to prognosis.**

Age in years	Total	Complete Recovery	Partial Recovery	No Recovery	Expired
20-29	8	4	2	2	0
30-39	10	2	6	2	0
40-49	14	2	4	4	4
50-59	20	2	6	2	2
60-69	34	6	8	14	4
< 70 yrs.	14	0	4	10	4

**Table 3: Risk factors observed in ischemic stroke patients.**

Risk factors	No. of patients
Hypertension	40
Diabetes mellitus	12
Smoking	46
Tobacco chewing	08
Dyslipidemia	18
Alcohol	16
Heart diseases	14
Family history stroke	02

[Table 3] shows the prevalence of risk factors amongst subjects with ischemia. Of the subjects evaluated 40 subjects had hypertension, 12 had diabetes, 46 had history of smoking, 08 had habit of tobacco chewing, 16 were habitual of alcohol, 18 had dyslipidemia, 14 had cardiac illness and 02 had a family history of stroke.

**Table 4: Prognosis in different risk factor**

	Total	Complete Recovery	Partial Recovery	No Recovery	Expired
	No.	No.	No.	No.	No.
No. of cases with history of hypertension	40	4	22	14	4
No. of cases without history of hypertension	60	8	24	22	6
No. of cases with diabetes	12	0	2	6	4
No. of cases without diabetes	88	14	36	28	10
Smokers	46	6	18	18	4
Non Smokers	54	4	16	24	6
Tobacco hewers	8	0	6	4	0
No chewers	82	12	34	30	6
No. of cases with Dyslipidemia	18	0	6	8	4
No. of cases without Dyslipidemia	82	12	34	30	6
No. of cases with Alcohol consumption	16	2	8	4	2
No. of cases without Alcohol consumption	84	8	28	38	10
No. of cases with heart diseases	10	2	6	0	2
No. of cases without heart diseases	90	12	36	34	8
No. of cases with family history of stroke	2	0	0	2	0

Table 4 shows the prognosis of ischemic stroke patient with different risk factors. Overall recovery was better in subjects without having any risk factor.

**Table 5: Clinical presentation of ischaemic stroke.**

Symptoms	No. of patients
Unconsciousness	14
Motor weakness	76
Sensory disturbance	0
Speech disturbance	28
Headache	12
Vomiting	4
Convulsions	2
Fever	0

The clinical presentation of stroke is shown in table 5.

## DISCUSSION

Ischemic stroke is a relatively common clinical condition. At present the available treatment for patients with ischemic is more or less ineffective. As a result, a majority of the subjects are left with permanent disability. An intervention to reduce the risk factors may effectively reduce the stroke related morbidity and mortality.

The reported risk factors are classified as mild, moderate and high risk factors and accordingly as well as proportionately these are considered as predictor for the same. The current study evaluated, 100 subjects admitted to our institute with the problem of ischemic stroke. In the present study we evaluated the stroke outcome in relation to demography, habits and various risk factors. The current study found, smoking, hypertension and dyslipidemia being the potent risk factors for stroke. This finding was in consistent with previous published studies.

Considering the incidence of stroke in gender, it was observed that, males were affected more with ischemic stroke compared to females. This may be

due to the prevalence of risk factors being more amongst males compared to females. Our study findings were similar to previous study reports.<sup>[5-6]</sup>

Evaluating the age as risk factor for incidence of ischemic stroke, it was observed that around half the population were in the age range of 60 years and above. This shows the high incidence of ischemic stroke amongst elderly. This finding was in consonance with the previous study report.<sup>[7]</sup>

The present study found hypertension as the risk factor for ischemic stroke. Though the incidence was much higher compared to previous study report of Feignet al and Bansal et al.<sup>[2,8-9]</sup>

The incidence of diabetes was similar to the study observation of Feignet al.<sup>[2]</sup>

The history of smoking was present in a very significant number of cases. This may be due to the no social barrier amongst the elderly for smoking. This finding was much higher than the previous study report.<sup>[2,8-9]</sup>

The history of chewing tobacco was present in many subjects. The incidence of dyslipidemia was present in 18 % cases, this was significantly higher when compared to Bansal et al.<sup>[5-7]</sup>

Some subjects were alcoholic as well and this finding was consistent with the Bansal et al.<sup>[5-7]</sup> The prevalence of cardiac ailment in our stroke subjects were much lower compared to the previous study reports.

Only 2 subjects in our study had family history of stroke. This was much lower compared to previous study reports.

## CONCLUSION

Habits and life style diseases are the most common modifiable risk factors in ischemic stroke. Modifying the risk factors with concurrent preventive measures may reduce the risk of mortality and morbidity.

## REFERENCES

1. Zhou J, Shan Y, Hu P. A systematic review and meta-analysis on transcranial Doppler in diagnosing ischemic cerebrovascular disease. *Annals of palliative medicine*. 2021; 10(8):8963-8971.
2. Cortese F, Scicchitano P, Cortese AM, Meliotta G, Andriani A, Truncellito L, Ciccone MM. Uric acid in metabolic and cerebrovascular disorders: A review. *Current Vascular Pharmacology*. 2020; 18(6):610-618.
3. Charles Warlow. Stroke, transient ischaemic attack and intracranial venous thrombosis: *Brain's Disease of the nervous system*. 11th edition, Oxford University Press, 2001; 776-830.
4. Wade S Smith, S. Claiborn Johnston, J. Donald Easton. Cerebrovascular Disease, *Harrison's Principles of Internal Medicine* 16th Edition, McGraw Hill Medical Publications, 2005;2372-2387.
5. Bogousslavsky. Ischemic stroke in patients under age 45. *Neurology Clinics*. 1992; 10:113-121.
6. Dalal PM. Strokes in young and elderly: Risk factors and strategies for stroke prevention. *JAPI*. 1997; 5(2):125-31.
7. AG Shaper, AN Phillips. Risk factors for stroke in middle aged British men. *BMJ*. 1991; 302:1111-1115.
8. Bansal BC. Recent concepts in stroke. *Medicine update. Association of Physician of India*, 1999;87-88.
9. R. Sridharan. Risk factors for ischemic stroke : A case control analysis. *Neuroepiemiology*. 1992; 11:24-30.
10. Feigin VL, Wiebers DO, Nikitin YP, O'Fallon WM, Whisnant JP. Risk factors for ischemic stroke in a Russian community: a population based casecontrol Study. *Stroke*. 1998; 29:34-39.
11. DaivaRastenYTE, MD, Jaakko Tuomilehto. Risk factors for death from stroke in middle aged Lithuanian men: results from a 20-year prospective study. *Stroke*. 1996; 27:672-676.
12. Jorgensen H, Nakayama H, Raaschou HO, Olsen TS. Stroke in patients with diabetes. *The Copenhagen Stroke Study*. *Stroke*. 1994; 25:1977-1984.
13. Bogousslavsky. Leusanne stroke registry – Analysis of 1000 consecutive patients with first stroke. *Stroke*. 1988; 19:1083-1092.
14. Natan M Bornstein, Aronovich BD, Karepov V G, Alex YG, Therese A. Traves, Michal Oved, Amos D'Korezyn. The Tel Aviv stroke registry: 3600 consecutive cases. *Stroke*. 1996; 27:1770-1773.