

Original Research Article


Study of clinical profile and risk factors in acute ischemic stroke

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	International Archives of Integrated Medicine, Vol. 8, Issue 11, November, 2021. Available online at http://iaimjournal.com/ ISSN: 2394-0026 (P) ISSN: 2394-0034 (O)
	Received on: 24-10-2021 Accepted on: 02-11-2021 Source of support: Nil Conflict of interest: None declared. Article is under creative common license CC-BY
How to cite this article: V. Aswin, R. Aravind Kumar. Study of clinical profile and risk factors in acute ischemic stroke. IAIM, 2021; 8(11): 9-14.	

Abstract

Background: Stroke or cerebrovascular accident is one of the leading causes of morbidity and mortality in adult life. Ischemic strokes are the most common type of stroke and they account for 80%–85% of cerebrovascular accidents worldwide. Clinical presentation of stroke is variable depending upon the involvement of vascular territory. The etiology of ischemic stroke varies in different populations due to differences in lifestyle, environmental and genetic factors. It also varies in different age groups. Hypertension, diabetes, dyslipidemia, and smoking have been identified as major risk factors. Many of the risk factors for stroke are modifiable. Recognition and early intervention of risk factors can reduce the incidence of ischemic stroke.

Aim of the study: To study the clinical profile & frequency of association of various risk factors in ischemic stroke patients.

Materials and methods: This study was conducted in the year 2019-2020 at 12 months at the Department of Interventional Radiology and Imaging Sciences, Tamil Nadu government multi-specialty hospital, Omandurar estate, Chennai. It was a hospital-based cross-sectional study conducted over one year among 100 ischemic strokes. The patient's clinical presentation, vessel involvement, risk factors, and their respective percentage were calculated. The data was compared with the studies carried out worldwide and in the Indian subcontinent and noted for any differences in the association of risk factors.

Results: The Ischemic stroke incidence was high in the age group of 56-70 years. It was seen that 78% of the sufferers were in the age group >45 years. Stroke was more common in males than females (ratio 3:1). Most of the stroke patients (66%) in our study belong to the low-income group. The most common clinical presentation was hemiplegia/ hemiparesis (88%). Cranial nerve

involvement was noted in 67% of patients and speech disturbances were found in 44% of patients. The most common vascular territory was involved in the middle cerebral artery. Around 92% of patients had middle cerebral artery infarction. In our study hypertension, smoking, alcoholism, dyslipidemia were significantly associated with stroke in patients with age groups more than 45 years.

Conclusion: Ischemic stroke has a male predominance and hypertension was found to be the most common risk factor. Systemic hypertension, smoking, alcoholism, dyslipidemia were significantly associated with stroke in patients with age more than 45 years.

Key words

Ischemic stroke, Clinical profile, Risk factors.

Introduction

Stroke is the second commonest cause of death. It is the fourth leading cause of disability worldwide. Nearly twenty million people each year will suffer from stroke and of those five million will die. Death due to stroke is no longer in the developed world. 85.5% of total stroke death occurs in developing countries. The morbidity of stroke in developing countries was approximately seven times that in developed countries [1]. Stroke is caused by the loss of the blood supply to the brain. This cuts off the oxygen and glucose causing irreversible damage to the tissues of brain parenchyma. WHO clinically defines stroke as “the rapid development of clinical signs and symptoms of a focal neurological disturbance lasting more than 24 hours or leading to death with no apparent cause other than vascular origin” [2]. Ischemic stroke is caused by loss of blood supply to brain tissues due to sudden occlusion of the arterial system. The occlusion may be due to emboli or thrombus. Ischemic stroke is responsible for 50 – 85% of all strokes worldwide. Non-modifiable risk factors for stroke include age, sex, and genetic factors. The modifiable risk factors for ischemic stroke include systemic hypertension, alcoholism, smoking, hyperlipidemia, diabetes, etc. [3]. By targeting various modifiable risk factors we can reduce the incidence of stroke. Study of non-modifiable risk factors also helps in identifying high-risk populations. Distribution of risk factors and their influence on ischemic stroke may be variable depending upon the geographical area and cultural background. Our study focused

on clinical profile and various risk factors that influence the occurrence of ischemic stroke [4, 5].

Materials and methods

This study was conducted in the year 2019-2020 at 12 months at the Department of Interventional Radiology and Imaging Sciences, Tamil Nadu government multi-specialty hospital, Omandurar estate, Chennai. It was a hospital-based cross-sectional study conducted over one year among 100 ischemic strokes. The patient’s clinical presentation, vessel involvement, risk factors, and their respective percentage were calculated. The data was compared with the studies carried out worldwide and in the Indian subcontinent and noted for any differences in the association of risk factors.

Inclusion criteria: All patients of ischemic stroke (on CT or MRI).

Exclusion criteria: Patients <18 yrs old and >80 yrs old. Patients with other forms of stroke-like ICH/ SAH/ post-traumatic Neoplasms (primary or secondary) CNS infections.

Results

In this study group which comprised of a total number of 100 patients, the age at presentation ranged from 18 to 46 years. Most patients belonged to the 46 and 31- 45 age groups with 12 and 3 patients respectively. There were 76 males (89%) and 24 females (11%) in the patients included in the study group (**Table – 1**).

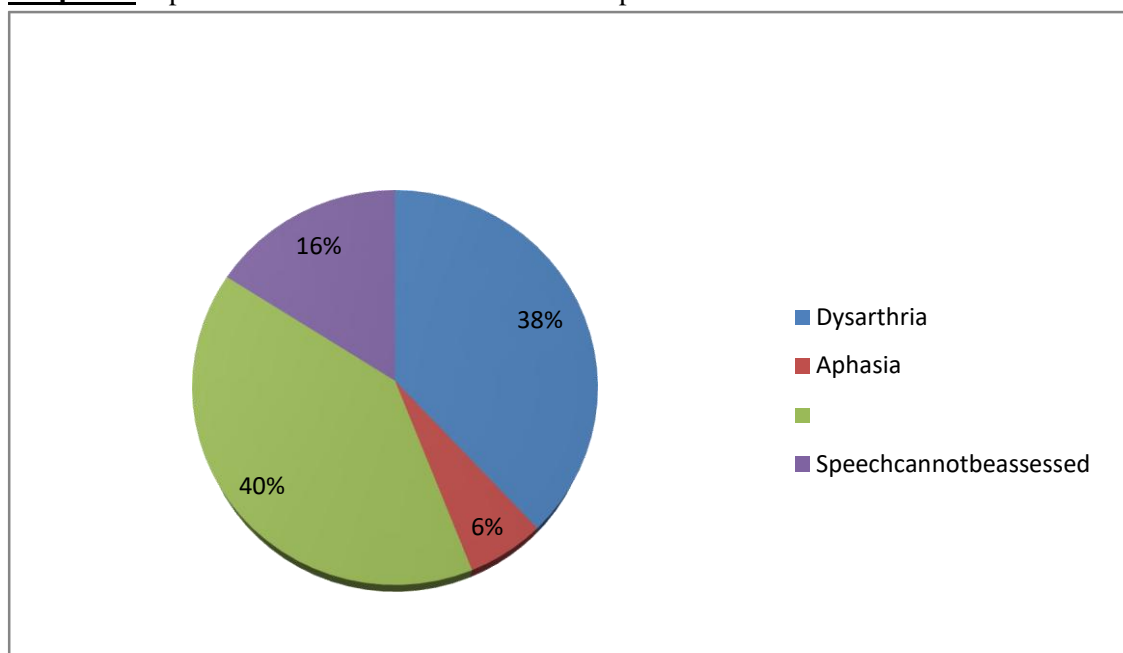
Table – 1: Age-wise distribution of ischemic stroke patients.

Age group	Sex		Total
	Male	Female	
18-30 years	5	2	7
31-45 years	12	3	15
>46 years	59	19	78
Total	76	24	100

Table - 2: Frequency of clinical features in ischemic stroke patients.

Clinical Features	Percentage
Motor weakness (Hemiplegia/ Hemiparesis/ Monoparesis)	88% (Rt sided 42, Lt sided 46)
Speech involvement (Aphasia or Dysarthria)	44% (38% Dysarthria, 6% Aphasia)
Cranial nerve involvement	67% (63% UMN 7th nerve, 2% LMN 3rd nerve, 1% LMN 7th & 12th nerve with gaze palsy and 1% LMN 9 & 10 Nerves)
Altered sensorium	16%
Seizures	7%
Gait disturbances/ Cerebellar signs	3%

Graph – 1: Speech involvement in ischemic stroke patients.



In our study, the most common clinical feature was hemiplegia/ hemiparesis. Eighty-eight percent (88%) of patients had hemiplegia/ hemiparesis. Among these left-sided weakness was more common (46% of patients had left-sided hemiplegia/ hemiparesis) 12% of patients had a stroke without any evidence of motor weakness (**Table – 2**).

Speech disturbances were found in 44% of patients, 38% of patients had dysarthria & 4% of patients had motor aphasia. Another 2% of patients were affected with global aphasia. In 100 patients 40% had normal speech (speech couldn't be assessed in 16% of patients because of altered sensorium) as per **Graph – 1**.

Graph – 2: Cranial nerve involvement in stroke patients.

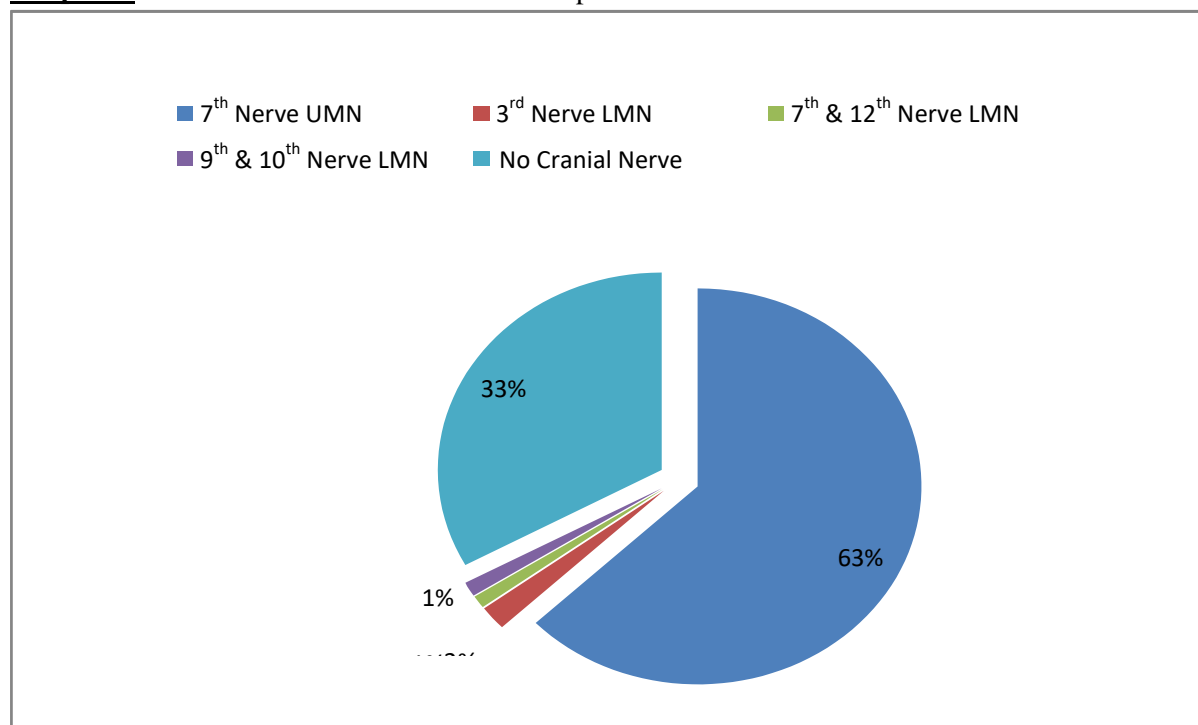


Table - 3: Vascular territory involvement in stroke patients.

Arteries involved	%
MCA alone	92%
ACA alone	2%
PCA alone	4%
MCA with PCA	1%
MCA with ACA	1%

The second most common clinical feature was cranial nerve involvement (67%). UMN fibers of facial nerve involvement were identified in 63 patients (63%). One patient had 9th & 10th (LMN) cranial nerve involvement. Another patient had 7th & 12th cranial nerve involvement (LMN). The third nerve is involved in two patients. Other clinical features: Among 100 stroke patients altered sensorium was found in 16 patients. 7% of patients had seizures. Three patients (3%) presented with cerebellar signs. Risk factors include systemic hypertension, chronic smoking, chronic alcohol intake, Diabetes Mellitus, significant cardiovascular disease, significant positive family history, dyslipidemia, past transient ischemic attack, history of stroke, and obesity. The commonest modifiable risk factor in our study was hypertension in 64% of patients. Smoking was the second common modifiable

risk factor in our patients (36%). Alcohol consumption was the third common modifiable risk factor (35%). Smoking & Alcoholism were identified only in the male population. The data was not sufficient to quantify the amount and duration of alcohol consumption. However, considering the alcohol habit of the population in our patients it should be considerably high. Diabetes mellitus (DM) which is an established risk factor was found in 26% of patients. Among all the stroke patients 16% were known as diabetic and hypertensive. Total of 15% of patients had concomitant heart disease (coronary artery disease/ RHD/ Cardiomyopathy/ AF). Eighteen percent of patients had dyslipidemia. Family history of stroke or TIA was present in 2% of patients. 12% of patients were obese and 10% of patients had a previous history of stroke or TIA (**Graph – 2**).

The middle cerebral artery was the most common arterial territory involved in our study. Around 92% of patients had middle cerebral artery infarction. Posterior & Anterior cerebral artery was involved in 4% & 2% of patients respectively. One patient had MCA with ACA territory infarct, while another patient had MCA with PCA infarction (**Table – 3**).

Discussion

Stroke is a major public health problem that has significant morbidities and mortalities. Worldwide, it is the third most common cause of death in adults. A stroke occurs predominantly in males in the late years of life [6]. Several studies documented that systemic hypertension, diabetes mellitus, hyperlipidemia, ischemic heart disease, atrial fibrillation, smoking, and long-standing alcohol intake are contributing factors for stroke [7]. The prevalence of risk factors varies in different populations. Despite numerous prior studies of stroke, risk factors remain 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 [8]. Various modifiable and non-modifiable risk factors were studied and analyzed in this study. In this study youngest patient was 21 years and the oldest was 79 years old. Elderly people are the most vulnerable group for developing stroke. The stroke incidence is high in the age group of 56-70 years of age. It is seen that 78% of the sufferers were in the age group ≥ 46 years and incidence increased with increasing age as depicted in the Bar graph. In the above study, males were most commonly affected by a stroke which is supported by the studies conducted in western countries [9]. However, the ratio of 3:1 seen in this study is higher than the studies conducted elsewhere. It could be due to lack of proper care to women and late admission in hospitals after it became a severe illness. In our society, smoking and alcohol is min the male population are high, which is not so common among the female

population. In our study, no cases of a female with alcoholism or smoking had been reported [10]. In the above study, 64% of stroke patients had hypertension and which is found to be the single most risk factor associated with stroke. Diabetes mellitus is one well-known, studied risk factor causing macrovascular complications. When compared with non-diabetic patients stroke risk doubles in diabetes. The above study reveals 26% of stroke patient has diabetes. In the Framingham study, 10 to 14% person with stroke had diabetes. The higher prevalence seen in our study may be due to the higher prevalence of diabetes in southern India from where most of the population under study hails. The data is in agreement with several other Indian studies. 16% of patients had both Hypertension and Diabetes. From various studies, it was concluded that strict control of blood pressure in diabetic patients will reduce the incidence of stroke [11]. Smoking appears as an important risk factor for ischemic stroke in this study. Thirty-six patients (36%) were smokers among 100 stroke patients studied. For cerebral infarction chronic heavy drinking and acute intoxication have been associated with an increased risk among young adults [12]. In older adults risk is increased among heavy-drinking men. Some studies have supported 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 risk for those drinking >5 drinks per day compared with non-drinkers. The deleterious effects of alcohol for stroke may occur through various mechanisms, including increasing hypertension, hypercoagulable states, and cardiac arrhythmias, and reduced cerebral blood flow [13]. In our study hemiplegia was the most common clinical feature. It was reported in 88% of patients, followed by cranial nerve involvement in 67% of patients. Speech disturbance was noted in 44% of patients. These features correlate with most of the studies. Regarding vascular territory, 92% of patients had isolated middle cerebral artery infarcts. The posterior cerebral artery is involved in 4% of cases. Only 2% of patients had anterior cerebral

artery involvement. One patient presented with a middle & anterior cerebral artery stroke [14, 15].

Conclusion

Most common clinical feature was hemiplegia/hemiparesis. Eighty-eight percent (88%) of patients had hemiplegia/hemiparesis. 12% of patients had a stroke without any evidence of motor weakness. Cranial nerve involvement was noted in 67% of patients and Speech disturbances were found in 44% of patients. The most common vascular territory is involved in the middle cerebral artery. Around 92% of patients had middle cerebral artery infarction. 10% of patients had a past episode of TIA or a previous stroke attack. So all patients with TIA should be followed up regularly and additional risk factors in these patients should be modified. Stroke patients should be advised for regular follow-up. The risk of recurrence should be explained and secondary prevention measures should be intensified.

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