

STUDY OF RISK FACTORS IN STROKE AMONG YOUNG INDIVIDUALS AT A TERTIARY CARE HOSPITAL: A RETROSPECTIVE STUDY

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Abstract

Background: Stroke is the second leading cause of death worldwide and was responsible for an estimated 6.5 million deaths and 113 million DALYs in 2013. Globally almost half of the entire stroke burden now affects young individuals given that they have a greater likelihood to survive their strokes with long life spans ahead and because strokes occur at younger ages in low-and middle-income countries. This study is conducted to find out various risk factors and etiologies in young patients with stroke. **Materials and Methods:** This study was retrospective clinical study. Patients diagnosed to have stroke in young admitted in MIMS, Mandya in the Department of Medicine from May 2019 to April 2020. **Result:** A total of fifty patients, 34 (68%) males and 16 (36%) females diagnosed to have Stroke were taken in our study. The male to female ratio was 2.1:1. The most common risk factor for stroke in young population was smoking (44%), Hypertension (36%), Alcohol (34%), Dyslipidemia (28%), Hyperhomocystienemia (24%), Cardiac diseases (12%), APLA syndrome (4%), Tuberculoma (2%) etc.. In our study 47 patients (94%) had ischemic stroke and 3 patients (6%) had hemorrhagic stroke. Among patients with ischemic stroke 42.5% were smokers, 34% were alcoholic, 31.9% were hypertensive, 17% were diabetic, 48.9% had dyslipidemia, 25.5% had hyperhomocystienemia, 10.6% had cardiac diseases. Among patients with hemorrhagic stroke 66.6% were smokers, 33.3% were alcoholic, 100% were hypertensive, 66.6% were diabetic, 33.3% had dyslipidemia, none had hyperhomocystienemia, 33.3% had cardiac diseases. **Conclusion:** Smoking and alcohol consumption were important acquired risk factors for stroke among young. HTN and DM were nonmodifiable risk factors commonly seen, especially HTN in cases of intracerebral hemorrhage. Rarer risk factors like homocystienemia should be considered during evaluation. There are many rare causes which cause stroke in young, which may be difficult to diagnose in many tertiary care setup, however every attempt should be made to identify risk factors and cause, with the available resources, to limit the morbidity and mortality due to stroke in young and achieve better prognosis.

INTRODUCTION

Stroke is the second leading cause of death worldwide and was responsible for an estimated 6.5 million deaths and 113 million DALYs in 2013. Stroke, a major Non-Communicable Disease (NCD), is responsible for 3.5% of disability adjusted life year (DALY) in India. In India, studies estimate that incidence of stroke population varies from 116 to 163 per 100,000 population. Recently, ICMR has come out with a report entitled “India: Health of the Nation’s States”, according to which stroke was 4th

leading cause of death and 5 Years (DALY) in 2016.^[1]

Apart from risk factors like hypertension, diabetes, heart diseases and positive family history, other lifestyle related factors such as unhealthy diet, obesity, lack of physical activity, stress and tobacco use account for its occurrence. Changes in lifestyles, behavioural patterns, demographic profile (aging population), sociocultural and technological advancements are leading to sharp increases in the prevalence of stroke. The disease by and large can be prevented by making simple changes in the way

people live their lives or simply by changing our lifestyle.

A stroke is caused by 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]

The majority of authors are using the age of 45 as the group’s upper limit.^[3] Others favor the age of 49.^[4] Globally almost half of the entire stroke burden now affects young individuals given that they have a greater likelihood to survive their strokes with long life spans ahead and because strokes occur at younger ages in low-and middle-income countries.^[5] This study is conducted to find out various risk factors and etiologies in young patients with stroke.

Objectives

1. To find the risk factors causing stroke in young.
2. To determine the type of stroke.

MATERIALS AND METHODS

Study Setting: Department of General Medicine at the teaching hospital of Mandya Institute of Medical Sciences, Mandya.

Source of Data: patient details obtained from medical records section

Study Design: retrograde study.

Study Period: May 2019 to April 2020, a period of 12 months.

Sample size: 50 cases

Type of Sampling: Purposive Sampling.

Inclusion Criteria

Age 18 - 45 years

Patients with abrupt onset of focal or global neurological deficit attributable to vascular cause and persist for more than 24 hours.

Clinical and radiological evidence of stroke.

Exclusion Criteria

Head injury

Age below 18 years and above 45 years.

Method of Collection of Data

This is a retrograde study. After approval from the institutional ethical and scientific committee and obtaining consent for collecting data from MRD through proper channels, data of patients admitted with stroke in age group between 18 years and 45 years was collected. Information was collected through structured proforma from each patient record. Data about name, age, sex, address, history of diabetes, hypertension, Heart disease, treatment history is collected. Systemic examination findings are noted. Investigations reports were collected. Radiological investigation reports collected. Data was entered in Microsoft Excel software and analyzed using the SPSS (Statistical Package for the Social Science) software. Analysis was done using descriptive statistics like proportion, percentage,

mean, and standard deviation, and inferential statistics like chi-square, t-test, and other suitable statistical tools were applied.

RESULTS

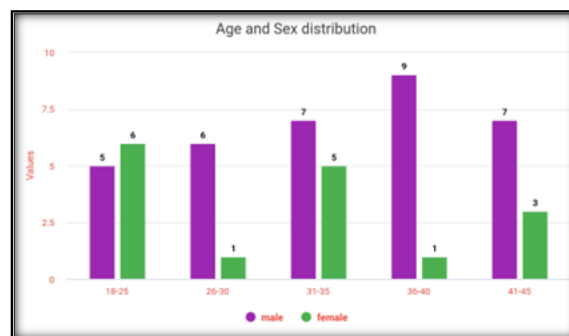
A total of fifty patients, 34 (68%) males and 16 (36%) females diagnosed to have Stroke were taken in our study. Our study found that mean age of the study group was 32.7 years and that of male patients was 33.8 years and female patients was 30.5 years. The majority of strokes occurred between the ages of 36-45 years. The male to female ratio was 2.1:1. From above findings we can conclude that incidence of stroke in young is more common in male gender.

The most common risk factor for stroke in young population was smoking (44%), Hypertension (36%), Alcohol (34%), Dyslipidemia (28%), Hyperhomocystienemia (24%), Cardiac diseases (12%), APLA syndrome (4%), Tuberculoma (2%) etc.

In our study 47 patients (94%) had ischemic stroke and 3 patients (6%) had hemorrhagic stroke. Among patients with ischemic stroke 42.5% were smokers, 34% were alcoholic, 31.9% were hypertensive, 17% were diabetic, 48.9% had dyslipidemia, 25.5% had hyperhomocystienemia, 10.6% had cardiac diseases. Among patients with hemorrhagic stroke 66.6% were smokers, 33.3% were alcoholic, 100% were hypertensive, 66.6% were diabetic, 33.3% had dyslipidemia, none had hyperhomocystienemia, 33.3% had cardiac diseases.

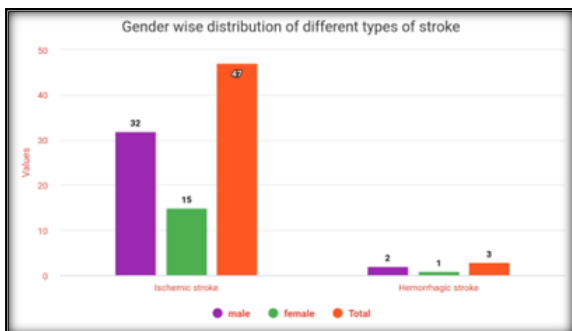
Age and sex distribution

AGE (in years)	MALE	FEMALE	TOTAL
18-25	5	6	11
26-30	6	1	7
31-35	7	5	12
36-40	9	1	10
40-45	7	3	10



Gender-wise distribution of different types of stroke

TYPE	MALE	FEMALE	TOTAL
ISCHEMIC	32	15	47
HEMORRHAGIC	2	1	3



Risk factors associated with Stroke

Sl no	Risk factors	Present		Absent	
		N	%	N	%
1	Smoking	22	44	28	56
2	Alcohol	17	34	33	66
3	Hypertension	18	36	32	64
4	Diabetes	10	30	40	80
5	Dyslipidemia	14	28	36	72
6	Hyperhomocystienemia	12	24	38	76
7	Cardiac disease(IHD/ RHD and others)	6	12	44	88

Sl no	Risk factors	Ischemic stroke(n=47)	Hemorrhagic stroke(n=3)	P value
1	Smoking	20(42.5%)	2(66.6%)	0.22
2	Alcohol	16(34%)	1(33.3%)	0.72
3	Hypertension	15(31.9%)	3(100%)	0.04
4	Diabetes	8(17)	2(66.6%)	0.02
5	Dyslipidemia	13(27.6%)	1(33.3%)	0.63
6	Hyperhomocystienemia	12(25.5%)	0(0%)	0.55
7	Cardiac disease(IHD/ RHD and others)	5(10.6%)	1(33.3%)	0.33

DISCUSSION

This is a retrospective study conducted at teaching medical college at MIMS, Mandya. A sample size of 50 patients fitting the definition of stroke in young was taken for study. Out of 50 patients 34 were males and 16 were females, with male to female ratio of 2.1:1. Study conducted by Chandrashekar et al,⁶ showed 1.7:1 male to female ratio and another study in north India by Mehndiratta et al showed a ratio of 1:0.8,⁷ Zunni et al demonstrated a ratio of 1.2:1 in Africa.⁸ We can conclude there is male

preponderance among stroke in young and male sex may be non-modifiable risk factor among young.

Our study showed a mean age of 32.7 years among the study group, whereas it was 31.38 years in study by Chandrashekar et al.⁶ and 31.97 years in study by Mehndiratta et al. The mean ages of males and females in study by Mehndiratta et al were 30.66 and 33.28 years.⁷ Mean age was 33.8 years and 30.5 years among males and females respectively in our study.

In our present study 18 patients (36%) had hypertension, which was the most common risk factor for stroke in young in our patients. Dalal et al showed an incidence of 46.7%, Alvarez et al 23%, Nagaraja et al 22.6% and Grindal et al 17.2% of hypertension as risk factor for stroke.^[9-12]

Smoking was the next common risk factor in our study with 22 patients (44%) being smokers, Chandrashekar et al showed an incidence of 36%, Dalal 40%, Alvarez et al 56.7%, Nagaraj et al 15% Bogousslavsky et al. 36.6%.^[6,9-11,13] In meta-analysis of 32 various studies of relation between stroke and smoking analyzed by Shinton et al. there was a strong association between smoking and incidence of stroke.^[14]

There were a total of 17 smokers (35%) in our study. The percentage of alcohol as a risk factor in other studies were as follows: Chandrashekar et al 42%, Dalal 40%, Alvarez et al 37.8%, Nagaraj et al 15%.^[6,9-11]

Our study showed 10% incidence of diabetes among the study group. Chandrashekar et al showed an incidence of 4%,⁸ Dalal 20%, Alvarez et al 10.9%, Nagaraj et al 11%, Grindal et al 5.2% and Zunni et al showed 14.8% incidence of diabetes.^[6,8-12]

Dyslipidemia among our study group was 28%. The same in studies by Chandrashekar et al. was 16%,^[6] and 8.94% in Patne et al.^[15]

Our study showed incidence of hyperhomocystienemia of 24%, incidence of same in study by Chandrashekar et al was 12% and Mehndiratta et al was 0.9%.^[6,7]

In the present study smoking was present in 42.5% of ischemic strokes and 66.6% of hemorrhagic strokes where as it was 18.11% and 4.72% in ischemic and hemorrhagic strokes respectively in Mehndiratta et al.^[7] In the study by Alvarez et al it was present in 56.74% of ischemic strokes.^[10]

In the present study alcohol consumption was present in 34% of ischemic strokes and 33.3% of hemorrhagic strokes where as it was 16.7% and 28.26% in ischemic and hemorrhagic strokes respectively in Bevan et al.^[16]

Diabetes was present in 14% of ischemic and 66.6% of hemorrhagic strokes in present study whereas it was 3.96% and 2.36% in ischemic and hemorrhagic strokes respectively in Mehndiratta et al.^[7] This did not concur with the present study probably because the incidence of diabetes mellitus was less in study by Mehndiratta et al.

In the present study hypertension was present in 31.9% of the ischemic and 100% of hemorrhagic

strokes whereas it was 16.53% and 3.14% in ischemic and hemorrhagic strokes respectively in Mehndiratta et al.^[7] This did not concur with the present study probably because there were number of risk factors present in the same patients diluting the effect of single risk factor. And also number of patients with hemorrhagic stroke in our study was very less.

Evaluations of various risk factors of stroke in young are important as they may play a major role in predisposing an individual to a disease which has terrible impact on the family and society. Stroke in young deserves an extensive evaluation that includes hematological, biochemical and angiographic studies. By these approaches, a large number of potential causes can be detected, and the treatment of these patients can be tailored according to the outcome.

Limitations

- This study was conducted in only 50 patients. Studies with more number of patients are required to apply the results for the community.
- It is a retrospective study hence problems associated with retrospective study cannot be eliminated.

CONCLUSION

Stroke in young is an important and emerging cause of morbidity among the young population due to exposure to acquired risk factors like smoking, alcohol, unhealthy food and development of hypertension, diabetes, dyslipidemia etc., at a younger age. There is increased male preponderance for stroke in young. Peak incidence of stroke in young population is between 36 and 45 years. Smoking and alcohol are the major acquired risk factors for stroke in young. HTN and diabetes mellitus were nonmodifiable risk factors commonly seen, especially HTN in cases of intracerebral hemorrhage. Hyperhomocysteinemia is one of the risk factors that has to be considered during evaluating persons with stroke in young age. Dyslipidemia in the form of elevated low-density lipoprotein and decreased high-density lipoprotein were also common. There are many rare causes which cause stroke in young, which may be difficult

to diagnose in many tertiary care setup, however every attempt should be made to identify risk factors and cause, with the available resources, to limit the morbidity and mortality due to stroke in young and achieve better prognosis.

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