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ORIGINAL RESEARCH

A Study on Social, Demographical and Etiological Risk Factors of Ischemic Stroke in Young

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ABSTRACT

Background: Worldwide, there are more than 11 million ischemic strokes annually, with over half of those occurring in countries with low or middle incomes. Even though ischemic stroke incidence typically rises with age, young adults between the ages of 18 and 45 are thought to account for 10% to 20% of cases. To understand the risks associated with stroke and the prognosis in long term is vital, especially in youngstershaving stroke with a life expectancy of decades. **Material and methods**: This study was conducted in Vijayapura, Karnataka. This study covered 72 patients in total. On the day of admission, visitors will pay patients in the wards a visit. Based on the specially designed questionnaire, the patient will be interviewed. The bystander and other accessible sources will be consulted in the event that the patient is unable to respond to queries. Neuroimaging is used to confirm the clinical diagnosis of stroke. To determine the cause of stroke in young people, pertinent investigations were carried out. **Results:** The total number of patients were 72, out of which 55(76.4%) are males and 17(23.6%) are females. 29(40.2%) patients have risk factors for atherosclerosis like hypertensives, dyslipidaemia, T2DM, smoking and alcoholism.12(16.6%) patients with haematological causes like deranged homocysteine.7(9.72 %) are found with cardioembolic causes like RHD. Vasculitis and infective causes are found in 4(5.5%) patients. 18(25%) patients are found without reason, even after adequate investigations. Occupational distribution, social and economic status, and stress levels by relevant scales are also noted in this study. **Conclusion**: In patients with young Stroke, the common presenting complaint is weakness of the limbs, and observing for any cranial nerve involvement, detailed history is significant as previous history of Stroke, diabetes, hypertensives have to undergo thorough evaluation for atherosclerosis,history of smoking and alcohol consumption, and cardiac embolism should be ruled out as it is one of the common cause, blood investigations like homocysteine, lipid profile, ANA profile, rule out vasculitis and other infectious causes.

Key words: young stroke, atherosclerosis, homocysteine, cardio embolism, dyslipidaemia.

INTRODUCTION

The World Health Organization defines Stroke as "rapidly developing clinical signs of focal disturbance of cerebral function, with symptoms lasting for 24 hours or more or leading to death, with usually no cause other than of vascular origin" [1]. Worldwide, there are more than 11 million ischemic strokes annually, with over half of those occurring in countries with low or middle incomes. According to a systematic review of 15 population-based research on stroke incidence [2] the overall stroke rate for people under 45 years of age ranged from 0.1 to 0.3 per 1000 person years, whereas the majority of the studies found that the rate for those 75 to 84 years of age was 12 to 20 per 1000 person years. Even though ischemic stroke incidence typically rises with age, young adults between the ages of 18 and 45 are thought to account for 10% to 20% of cases [3]. To lower the worldwide burden of young Stroke, it is critical to create effective, region-specific preventative and therapeutic strategies based on an understanding epidemiological factors involved in young ischemic stroke. Understanding risk factors and the long-term prognosis is critical, especially in young stroke patients with a life expectancy of decades [4]. In India, where ischemic strokes account for 80% of all

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strokes, the rest being haemorrhagic. About 10%-30% of stroke victims in India are young people, compared to 3%-8.5% in Western nations [5]. A wide range of illnesses were the cause of the ischemic strokes that affected the young patients. Every young patient experiencing a stroke should have a thorough assessment to ascertain the cause-a comprehensive assessment results in an etiological diagnosis, which allows for appropriate acute care and long-term care.

AIMS AND OBJECTIVES

To Study Social, Demographical and Etiological Causes of Ischemic Stroke in Young.

MATERIALS AND METHODS

This study is done at SHRI B.M. PATIL Medical College and Hospital, Vijayapura. A total of 72 patients are included in this study over 18 months. This is a hospital-based, cross-sectional, analytical study. The diagnosis of Stroke is established clinically and confirmed by neuroimaging (non-contrast C.T. head and MRI brain). Patients admitted to the wards will be visited on the admission day. The patient will be interviewed based on the questionnaire prepared for the purpose. If the patient cannot answer the questions, necessary information will be obtained from the bystander and other available sources.

The Following Data is obtained:

Name, age, sex, religion, socioeconomic status (modified Kuppuswamy scale), dietary habits, stress levels (The Holmes – Rahe life stress inventory), depression level (Major Depression Inventory), habits, common risk factors like Hypertension, Diabetes, Dyslipidaemia, Smoking, Obesity and physical inactivity, Heavy episodic alcohol consumption, Connective tissue disorders.

Relevant investigations like CT/MRI, ECG, complete blood count, LFT, ANA profile, echocardiography, homocysteine, renal function test, and lipid profile are done.

INCLUSION CRITERIA

1. Acute Ischemic stroke patients (Patients presenting with a history suggestive of Stroke and proven by C.T. brain or MRI brain).
2. Patients aged between 18 and 45 years.

EXCLUSION CRITERIA

1. Haemorrhagic Stroke
2. Venous Stroke
3. Trauma

STATISTICAL ANALYSIS

The data obtained will be entered in a Microsoft Excel sheet, and statistical analysis will be performed using JMP SAS 16 software.Data will be expressed as Mean (Median) ±SD or Median and Interquartile range, Frequency, percentages and diagrams. For normally distributed continuous variables between two positive and negative for SBP will be compared using independent t test and not normally distributed variables Mann Whitney. U test will be used. Categorical variables will be compared using Chi square test. (If necessary)

RESULTS

A total of 72 patients aged between 18 and 45 years who were admitted or outpatients in Shri B.M Patil Medical College and Hospital, with clinical features and imaging suggestive of ischemic Stroke, were included in the study.

In this study, a maximum number of patients were between 40 and 45 years old (52.8%).Among 72 patients, 55 (76.4%) are males, and 17 (23.6%) are females(table 1).

Table 1: Age distribution

Age (years)	No. of patients	Percentage
<20	1	1.4
20- 24	1	1.4
25-29	7	9.7
30-34	10	13.9
35-39	15	20.8
40-45	38	52.8
Total	72	100

Patients present with many clinical features, of which weakness of limbs is the primary complaint (91%) associated with other features such as cranial nerve involvement, speech disturbance, headache, visual disturbance and sensory disturbance(table2).

Table 2: Presenting clinical features

Clinical feature	No of pt.	Percentage
Weakness	65	91%
Speech disturbance	36	50.2%
Sensory disturbance	29	41.5%
Headache	15	22.3%

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Altered sensorium	11	16.2%
Giddiness	8	12.7%
Cerebellar symptoms	6	8.3%
Visual disturbance	4	5.55%

In this study showing 25 patients of previously known and new detected hypertensives of 72 patients, diabetes of 10 patients (13.9%), dyslipidaemiaand other causes of atherosclerosis like smoking, alcohol consumption and tobacco chewing history is taken. The following table shows the risk factors of atherosclerosis (table 3).

Table 3: Atherosclerotic causes

Risk factors	No. Of patients	Percentage
Diabetes	10	13.9
Hypertension	25	34.5
Hyperlipidaemia	20	27.8
Smoking	14	19.4
Alcohol	29	40.3
Tobacco chewing	21	29.2

In patients with diabetics Hba1c is done, in which majority belongs to range 7.6-8.5 (table 4).

Table 4: Range of HbA1c in diabetics

Hba1c(Range)	Frequency	%
6.5 – 7.5	4	40
7.6 – 8.5	5	50
8.6 – 9.5	1	10

Haematological test was performed in all the patients. Homocysteine is deranged in 12 patients which is 16.6% (table 5).

Table5: showing deranged homocysteine levels.

	Frequency	Percent%
Normal	60	83.3
HYPERHOMOCYSTENEMIA	12	16.6
Total	72	100.0

Along with the routineinvestigations, we got echocardiography and ANA titre for required patients which shows positive in few patients and few are known SLE cases. RHD is seen in 4 (5.5%) of patients. SLE is found in 3 (4.16%) of patients (table 6).

Table 6: Non atherosclerotic and associated diseases

Diseases	Frequency	Percent %
SLE	**3**	**4.16**
RHD	**4**	**5.55**
ACS	**3**	**4.16**
DPN	**1**	**1.4**
Vasculitis with RVD	**1**	**1.4**

Cardioembolic cause for stroke is seen in 9.7% of the patients, where patients are with Rheumatic heart disease with mitral valve thickening. Atherosclerotic cause seen in 29 (40.2%) patients.In 18 patients (25%), no cause is identified even after adequate investigations (table 7).

Table 7: Etiological cause of young stroke

Etiology group	No. of patients	Percentage %
Haematological	12	16.6
Cardioembolic	7	9.72
Atherosclerosis	29	40.2
Non atherosclerosis	4	5.5
Others	2	2.77
Unknown cause	18	25

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In this study, along with other risk factors, depression levels of the patient are also studied by using major depression inventory scale, in this study majority belongs to no/ doubtful depression (table 8).

Table 8: Major depression inventory scale

	Frequency	Percent %
No/Doubtful depression	40	55.6
Mild Depression	27	37.5
Moderate Depression	5	6.9
Total	72	100.0

Holmes and Rahe life stress inventory: Majority of the patients belong to moderate stress in this study, done by using Holmes and Rahe scale (table 9).

Table 9: Stress scale by Holmes and Rahe

	Frequency	Percent
<= 150	32	44.4
151 - 300	40	55.6
Total	72	100.0

Socioeconomic status is measured for all the patients using kuppuswamy scale, majority of them belong to upper middle followed by lower middle class (table 10).

Table 10: Socioeconomic status by kuppuswamy scale

Score	Kuppuswamy scale	Patients score	Percentage (%)
26-29	Upper class	1	1.38
16-25	Upper middle	41	56.94
11-15	Lower middle	27	37.5
5-10	Upper lower	3	4.16
<5	Lower	0	0

DISCUSSION

In this study, we conducted various investigations and provided proper history to find the cause of ischemic Stroke in young adults.

We compared this study with others done by Vijay B Gaikwad [6], P Chandrasekaran [7] in India and by Ester Boot [8], which is a global perspective study. All patient's clinical characteristics were examined.

The most common presentation was weakness in the extremities, alone or in conjunction with speech problems and sensory issues6. In the study done by Chandrasekharan [7] in Salem, weakness is the most common complaint associated with other features, which is 93.68%. Headache, giddiness, altered sensorium, and visual abnormalities were weakness-related symptoms. In this study, most patients presented with limb weakness (91%), followed by speech disturbances (50%), sensory disturbances and headache.

Risk factors of atherosclerosis like diabetes, hypertension, hyperlipidaemia, and habits (smoking, tobacco chewing and alcohol consumption are seen in 64.4% of the patients in this study, and the remaining 35.6% don't have any of these risk factors. This shows the major influencing factors and causes of ischemic Stroke in young. Diabetes is found in 13.9% of the patients in this study; a review of the global perspective of ischemic Stroke in young by Ester boot [8] gives that the population attributable risk of diabetes in young Stroke was highest in Southeast Asia (28.6%), and the lowest in Europe (3.5%). In p Chandrasekaranstudy [7] diabetes is seen in 7.94% of the patients.

Hypertension is one of the significant atherosclerotic causes of Stroke. Esther's boot [8] study shows that 35% of young ischemic stroke patients are hypertensives, and the majority are from southeast Asia. In my research, 34% of the patients are known and newly detected hypertensives. In a study by deepadharshanhuliyappa [9] hypertension is seen in 50% of his study patients.

Cardio embolism due to Rheumatic heart disease, Vijay B Gaikwad [6] detected 10% of the patients with RHD, in this study found 5% of patients. Patients with echocardiographic features of the mitral valve (anterior leaflet thickening 3.5mm, chordal thickening, restricted motion), one patient with A.V. prolapse. In a study by Harold p found 33 (22.9%) patients with with potential cardiac cause for cerebral embolism [10]. In young people, the prevalence of cardioembolic stroke varies from 14% to 47% [11].

About 50% to 60% of young stroke patients have dyslipidaemia, which is slightly more common in men than in women [12]. The prevalence of lipid disorders in young adults increases. In a study done by Vijay B Gaikwad in Mahatma Gandhi University, 32% of the young stroke patients showed dyslipidaemia [6]. We

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found 27.8% of the patients with hyperlipidaemia in this study.

Many studies have shown the relation and risk of homocysteine with ischemic Stroke. A recent analysis by Rizaldy Taslim Pinzon says that patients who had an ischemic stroke had significantly higher levels of homocysteine than controls, according to an integrated analysis [13]. In my study, 25% of the patients had high homocysteine levels in younger individuals. A significant independent risk factor for the prognosis of patients with ischemic Stroke is homocysteine. Studies have revealed that homocysteine (Hcy), among a number of risk parameters, is an independent risk factor and is associated with cerebral infarction brought on by intracranial small-vessel disease as well as extracranial vascular disease, which includes peripheral artery disease and myocardial infarction [14,15].

Autoimmune conditions like SLE are seen in 3% of the patients. In Vijay B Gaikwad [6] study, 4% of the young stroke patients are diagnosed with SLE. In P Chandrasekar [7], the study shows that 4.76% of patients have SLE.

MDI in this study shows 55.6% of patients with no or doubtful depression, 35.5% are in mild depression, and moderate depression is of 6.9%, giving the impression of less history of depression in the patients prone to ischemic Stroke at a young.

Holmes and Rahe's Life Stress Inventory majority (55.6%) of the patients are prone to moderate to high stress before the stroke event, and 44.4% are less prone to anxiety. High blood pressure and heart rate may raise your risk of Stroke if you experience frequent stress. Stress is also associated with alterations in blood coagulation and inflammation, which may contribute to problems with blood flow that could result in a stroke. Your muscles will receive abundant oxygen and nutrients during the stress response.

CONCLUSION

In patients with young Stroke, the common presenting complaint is the weakness of the limbs. For any cranial nerve involvement, a detailed history is significant as previous history of Stroke, diabetes, and hypertensives have to undergo thorough evaluation for atherosclerosis caused by smoking and alcohol consumption, and cardiac embolism should be ruled out as it is one of the common cause, blood investigations like homocysteine, lipid profile, ANA profile, rule out vasculitis and other infectious causes.

Because of recurring vascular episodes, the likelihood of long-term disability increases with time. As the primary and secondary preventive measure against recurrent stroke, these data emphasize the necessity of developing a strategy for early identification of the established stroke risk factors and implementing vigorous therapeutic care in all patient groups.

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