

Study of Etiology and Clinical Profile of Patients with Young Stroke

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Abstract: ***Background:** Stroke in patients younger than 45 years of age has been considered rare event and may have dramatic impact on the quality of life in survivors. **Methodology:** A cross-sectional study recruited 50 patients presented with stroke in age group between 15-45 years. In this study, we aim to investigate the various cause, risk factors, clinical and laboratory profile and outcome in patients presented with young stroke. **Results:** In this study maximum stroke seen between age of 31-40 years and more in males than females. Most common type of stroke was ischemic stroke and most common risk factor was dyslipidemia, hypertension, diabetes, smoking, alcohol, tobacco chewer. Most commonly patients presented with motor deficit and worse type of prognosis seen in Hemorrhagic type of stroke. **Conclusion:** Most of young adults had modifiable vascular risk factors, emphasizing the importance of primary and secondary prevention strategies help in decrease the incidence of disease. Outcome was unfavourable when there was delay in diagnosis, hence proper insight about disease help in early diagnosis and treatment of disease.*

Keywords: Young stroke, Cross sectional study, Risk factors, Outcome.

1. Introduction

A stroke or cerebrovascular accident is defined as an abrupt onset of neurological deficit that is attributable to a focal vascular cause. [1] Stroke is mainly of two types: ischemic and haemorrhagic. Majority of authors consider “young stroke” as an individuals less than 45 years of age.[2] Stroke is less frequent in younger age group as compare to the clinical Presentation and etiology of stroke in young adults is extremely different and diverse from an elderly patient. Stroke in the young has disproportionately larger economic and social impact by leaving victims disabled during their most productive years as compared to the older patients.

The rising incidence of stroke among younger individuals is particularly concerning.[3] According to the FUTURE study, a decade after experiencing an ischemic stroke or intracerebral haemorrhage, one in eight young adult survivors remains dependent on assistance for daily activities.[4] This study aims to provide insight into the risk factors, causes, and clinical characteristics of stroke in younger individuals.

Study design: A prospective and cross-sectional study.

Source of data: Data for the study was obtained from patients presented to OPD or Casualty with clinical features of stroke and admitted to Seth L.G. Hospital from June 2023 to September 2024, total no of 50 patients enrolled in this study who fulfilled inclusion criteria.

This study includes patients aged between 15 and 45 years who provide informed consent to participate and have a clinical diagnosis of stroke.

2. Methodology

For all the patients sufficing inclusion criteria and give written consent was included in the study. The protocol detailed history included all symptoms pertaining to stroke in detail with emphasis on all the risk factors attributable to

the stroke. A detailed clinical examination was done and neurological deficits were identified. Relevant investigations like hemoglobin, total white cell count, blood glucose, blood urea, serum creatinine, serum lipid profile was done for the required patients.

Chest X-ray, echocardiogram was done for all patients. All patients were subjected to neuroimaging; and patient with normal CT brain within a few hours of onset of symptoms, were later subjected to MRI brain, including diffusion weighted imaging, which can detect infarct within minutes of the onset of stroke, that is considerably earlier than CT and other MRI sequences. Vascular imaging of intracranial & extra cranial vessels was done for patients whenever it was indicated, using CT Angiography or MR Angiography/venography. Color Doppler sonography of extra cranial vessels was done whenever CTA or MRA was not possible.

The results were analysed to assess the etiology, risk factors, the pattern of clinical and radiological profile and outcome of patients until discharge from hospital.

After collecting data for all parameters, patients were subdivided into groups:

- Ischemic stroke
- Hemorrhagic stroke
- Venous thrombosis

3. Results

Total 50 Patients were included in my study during the study period from June 2023 to September 2024.

Table:1 Age and Gender Distribution in the Study Population

Age	Male (numbers)	Percentage	Female (numbers)	Percentage
15-20	1	3.33%	2	10%
21-30	10	33.33%	5	25%
31-40	13	43.33%	9	45%
41-45	6	20%	4	20%
Total	30	60%	20	40%

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In our study maximum cases of young stroke (44%) occurred between the ages of 31- 40 Years, followed by 21-30 years age group (30%). In both genders more common age group is 31-40 years.

In our study, the percentage of males was 60% (30 Patients) and the percentage of females was 40% (20 Patients). Male: Female ratio = 1.5:1.

Table 2: Types of Strokes based on CT/MRI Findings

Gender	Ischemic Stroke	Haemorrhagic Stroke	Venous Thrombosis
Male	17	13	0
Female	15	3	2
Total	32	16	2

We analyzed 50 stroke patients for our study, in which there are total 32 patients suffering from ischemic type of stroke, and we also found that in our study males and females are almost equally affected. 16 patients suffering from hemorrhagic type of stroke in which male preponderance found. Venous thrombosis types of strokes are mainly found in female patients due to many affecting risk factors like pregnancy, OC Pills, hormonal effects etc.

Table 4: Clinical Features in Study Population

	Ischemic Stroke	Hemorrhagic Stroke	Venous Thrombosis	Total	Percentage
Convulsion	4	12	1	17	34%
Headache	2	8	2	12	24%
Giddiness	4	3	0	7	14%
Motor Defeciet	28	12	2	42	84%
Sensory Defeciet	9	3	0	12	24%
Dysarthria	14	3	1	18	36%
Facial Weakness	7	1	0	8	16%
Concious Level					
ALERT	32	4	1	37	74%
DROWSY	1	8	1	10	20%
STUPOR	0	2	0	2	4%
COMA	0	1	0	1	2%
Cerebellum Involvement	4	0	0	4	8%

In our study, 26% presented with altered levels of consciousness, while 34% of the patients presented with seizures. On examination, motor deficits, facial weakness, sensory deficits & cerebellar deficits were found in 84%, 16%, 24% & 8% of the patients, respectively. 6% of patients were either stuporous or comatose.

In our study out of 50 patients 48 patients (96%) was discharged with or without disabilities while 2 patients (4%) was died due to severity of disease.

4. Discussion

Total 50 cases who fulfilled inclusion criteria with clinical signs and symptoms of stroke admitting in L.G. hospital, during study period were included in study. Among them 30 were males and 20 were females in our study, and M:F ratio was 1.5:1.

In our study, males (60%) were more affected than females

Table 3: Risk Factors/ Comorbidities in Different Types of Stroke

	Ischemic Stroke	Hemorrhagic Stroke	Total	Percentage
Hypertension	11 (35.48%)	10 (66.66%)	21	42%
Diabetes	12 (38.70%)	1 (6.66%)	13	26%
Dyslipidemia	15 (48.38%)	0	15	30%
IHD	6 (19.35%)	0	6	12%
P/H/O CVA	3 (9.67%)	1 (6.66%)	4	8%
CTD	1 (3.22%)	1 (6.66%)	2	4%

In our study most common risk factor/comorbidities for ischemic type of stroke is dyslipidemia (48.38%), followed by diabetes (38.70%) and hypertension (35.48%).

Most common risk factor/ comorbidity for hemorrhagic stroke is hypertension (66.66%).

Study most common overall modifiable risk factor was smoking (38%) as well as tobacco chewing (38%), followed by Alcohol intake (24%), drug abuser (6%) and OC pills (6%).

Based on NCEP (National Cholesterol Education Program) guidelines, normal values of Serum Cholesterol < 200 mg/dl; LDL < 100; Triglycerides < 200mg/dl. In our study, high LDL levels and low HDL levels were more commonly associated with ischemic stroke.

(40%) & incidence of stroke Increased with age, with 64% of the patients in the study group were above 30 years of Age. Higher age & male sex are non modifiable risk factors.

Patients had a number of clinical features in our study. Seizures (34%), altered state of consciousness (26%), speech abnormalities (36%), Motor deficits (84%), cerebellar deficit (8%), sensory deficits (24%).

Most common comorbidities associated with young ischemic stroke in our study were dyslipidemia (48.38%), followed by diabetes (38.70%) and hypertension (35.48%). most common comorbidity for hemorrhagic stroke was hypertension (66.66%).

Most common overall modifiable risk factors among young stroke in our study were smoking (38%) as well as tobacco chewing (38%), followed by Alcohol intake (24%). 3 patients having history of OC Pills in which 2 patients

developed venous thrombosis and 1 patient developed hemorrhagic stroke. 2 patients developed ischemic stroke who having h/o SLE.

Based on CT/MRI brain plain findings males and females are almost equally affected in ischemic type of stroke (17 males & 15 females), where in hemorrhagic type of stroke male preponderance seen (13 males & 3 females), and venous thrombosis seen in female population in our study was related to h/o OC Pills.

On evaluating the CT/MRI brain scan, even though arterial pathology (96%) was more Common than venous obstruction (4%) in our study, cortical venous thrombosis should be considered in young patients with stroke, especially in young females. Among the types of Strokes, ischemic stroke (64%) was much more common than hemorrhagic stroke (32%) in young patients.

Total 2 patients died during their hospitalization, and 48 patients survived. These 2 patients having ICH died due to increased intracranial tension. Hence, hemorrhagic stroke having worst prognosis among patients, who suffering from very severe manifestation.

5. Conclusion

Stroke in young adults can have a devastating impact on the Socio-economic status and quality of life of the individual. The causes and risk factors for stroke in the younger often rare or undetermined. The modifiable risk factors like dyslipidemia, hypertension, smoking, alcoholism leading to premature atherosclerosis of vessels are increasingly becoming common among young adults nowadays, because of sedentary lifestyle, physical inactivity, high fat diet, etc. Therefore, it is important to know about risk factors and guide all the interventions for the awareness as well as primary prevention of such debilitating neurological disorder in young people.

The prevalence of these modifiable risk factors like hypertension, vascular atherosclerosis; increases with age & are more common in males. For adequate secondary prevention, it is important to identify these risk factors and modify them by life-style changes, strict controlled medications or invasive intervention, when indicated.

Therefore, it is necessary to have the proper knowledge about the natural history, etiologies, Diagnostic approach and management of the stroke in young patients.

Abbreviations:

CTA: CT Angiography

MRA: MR Angiography

OC Pills: Oral Contraceptive Pills

IHD: Ischemic Heart Disease

CVA: Cerebrovascular Accident

CTD: Connective Tissue Disorders

LDL: Low Density Lipoproteins

HDL: High Density Lipoproteins

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