

Stroke In Young In Southern Rajasthan: A Hospital Based Study

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Abstract

Background: In recent years there has been an exponential increase in number of stroke patients. Against the classical dictum classifying stroke as a disease of elderly, world has noticed shift in paradigm as day by day there is increase in cases of young stroke especially in developing nations. **Objective:** Young stroke is altogether a different entity from its adult counterpart. We didn't come across any study specifically exploring stroke in young in this part of Rajasthan. We tend to determine clinical and demographic variables of young stroke and also looked for possible underlying aetiologies in our study. **Method:** This was a cross-sectional single centre tertiary care centre hospital based study of all young stroke patients who met inclusion and exclusion criteria and presented to our department over a period of eighteen months from October 2018 till March 2020. **Results:** Mean age of our study group was 38.8 years with male preponderance. Sixty five percent had ischemic stroke, most common aetiology was atherosclerotic. Twenty six percent had haemorrhagic stroke. CVST (Cerebral Venous Sinus Thrombosis) was diagnosed in eighteen (9%) patients with female preponderance. Most common presenting symptom was hemiparesis in (54%) patients. Mean triglyceride and LDL levels were 152.2 ± 78.6 mg/dl and 111.3 ± 40.2 mg/dl respectively. **Conclusion:** Globally young stroke is increasing at an alarming rate. Increasing stroke disability in this economically productive section can lead to significant social and economic recession worldwide. Different population groups have different incidence and underlying aetiologies, so there is a need of population-based studies to guide management plan.

Keywords: Young stroke, Ischemic, Haemorrhagic.

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Introduction

Identification of stroke is important in developing country like ours as it is anticipated that by 2050 around 80% stroke events will occur in inhabitants of developing nation. [1,2] In recent years there has been a shift in prototype of age of stroke presentation which has drawn world- wide attention. A population based stroke epidemiology study reported increased incidence of all strokes under age 55 years from 12.9% in 1993/

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1994 to 18.6% in 2005. [3] A systematic review of young stroke patients showed crude incidence rates between 5.8-39.8 per lakh. [4] In a young stroke registry of 1,008 patients the estimated annual occurrence was 10.8 per 100,000. [5] In comparison to older stroke patients, disability due to stroke in young lead to consequential socio-economic burden on patient and family members during their most productive years. Young stroke have varied presentation and aetiology which influence diagnostic evaluation and treatment, thus conventional risk factors for stroke cannot always be applied to young stroke. Racial and ethnic differences also affect incidence.

An Italian study reported a crude incidence of 12.1 cases per 100,000, [6] a higher stroke incidence was

reported in Japanese study in the 35–44 year age group.[7] The Northern Manhattan Study showed that young blacks and Hispanics have a greater incidence of stroke than young whites.[8] A study comparing overall standardized rate of stroke incidence on Indians noticed higher rate and susceptibility for all age groups than that observed in USA, Europe and Australia.[9] We undertook this study to determine clinical and demographic profile of young stroke in southern part of Rajasthan as we did not come across any study exploring this population group and we also tried to focus on different etiological aspects which can enlighten management strategies.

Materials and Methods

This was a tertiary care centre hospital based cross sectional study of all young stroke patients who presented to our centre over a period of eighteen months from October 2018 till March 2020. Two hundred consecutive patients in age group of 15–49 years with confirmed diagnosis of stroke were included. The study protocol was approved by the institutional review board. Patients demographic profile, family history, neurological examination and investigations were duly recorded on predefined protocol. All patients underwent neuroimaging MRI brain with stroke protocol, blood investigations, lipid profile, 2D-Echo, DSA, Serum homocysteine level, Serum VDRL, Vasculitic profile was done in selected group of patients. Stroke was classified as Ischemic or Haemorrhagic. Ischemic stroke was further sub-classified on etiologic basis as atherosclerotic, cardioembolic stroke, other determined causes and cryptogenic. Haemorrhagic stroke was categorized as Lobar, basal ganglionic or subarachnoid haemorrhage depending on site of involvement. All patient of age group 15–49 years fulfilling WHO stroke criteria[10] presenting with stroke were included while those having prior history of head injury or tumoral bleed, radiological diagnosis of meningitis, encephalitis, space occupying lesion, metabolic encephalopathies, complicated migraine and other stroke mimics were excluded.

Definitions

Arterial hypertension: Patient who were known case of hypertension prior to treatment or whose BP > 130/80 mm Hg at time of presentation.[11]

Diabetes mellitus: Known case of diabetes or who presented in hyperglycaemic crisis with random plasma glucose ≥ 200 mg/dl (11.1 mmol/l) or Fasting plasma glucose ≥ 120 mg/dl (7 mmol/l) or 2 hr plasma glucose ≥ 200 mg/dl (11.1 mmol/l) during an OGTT.[12]

Hypertriglyceridemia: Diagnosed by a physician or a known case; or Triglycerides of ≥ 150 mg/dl; or High density lipoprotein of ≤ 40 mg/dl for men and ≤ 50 mg/dl for women.[13]

Hyperhomocysteinemia: Serum homocysteine Levels above 9.9 $\mu\text{mol/l}$ were considered to be abnormal.

Results

Mean age of our study was 38.8 years with youngest patient of fifteen years. The study showed male preponderance (Fig 1). Most common stroke subtype was ischemic (Fig 2). Among 130(65%) patients with ischemic stroke, 98 (75.4%) patients had anterior circulation and 32 (24.6%) had posterior circulation stroke. Some patients of Ischemic stroke (Fig 3) presented in window period and underwent treatment according to recommended guidelines. Most common aetiology in ischemic stroke group was atherosclerotic (Fig 4). Among fifty two haemorrhage patients, basal ganglia and internal capsule were most common site of involvement (Fig 5). CVST was diagnosed in eighteen(9.0%) patients with female preponderance (66.7%), all were postpartum.

Twenty six(13%) were newly diagnosed diabetics and 60(30%) patients were having hypertension. Twenty one (16.2%) patients had cardioembolic stroke with fifteen patients diagnosed as rheumatic heart disease, ten patients were diagnosed with atrial fibrillation at time of stroke, two patient had LA apical clot and one had patent foramen ovale on saline bubble study. Forty(20%) patients all males were having addiction of which ten were tobacco chewers and thirty two had smoking habits and h/o alcoholism.

Most common presenting symptom was hemiparesis in one hundred eight(54%) patients, with headache as most common presenting symptom in CVST patients while focal seizures was presenting symptom in 8 of CVST patient. All six SAH patients presented with thunderclap headache and nuchal rigidity. DSA was conducted in sixty patients of which ACoM aneurysm was diagnosed in three, Bilobed PCoM aneurysm in one patient, MCA aneurysm in two, remaining patient showed large vessel occlusion. Homocysteine level was evaluated in selected patients of which 30(15%) had abnormal high levels with 5 patients having >50 levels. Mean cholesterol levels were 183.4 ± 51.3 mg/dl, Mean triglyceride levels were 152.2 ± 78.6 mg/dl, Mean LDL levels were 111.3 ± 40.2 mg/dl. ANA was positive in four out of 40 patients investigated and none was APLA positive. Prothrombotic work up was done in ten selected patients and all were negative.

Discussion

In our study ischemic stroke was most common subtype (65%) which was similar to other Indian studies on young stroke.[14,15] Highest proportion was found in 31-45 year age group similar to a Indian study,[16] this could possibly due to direct consequence of prolonged exposure to diagnosed and undiagnosed risk factor to which ageing is a contributory phenomenon. Male preponderance was found in our study (73%) in both ischemic and haemorrhagic stroke similar to other Indian and Denmark based study.[16-18]

Among aetiology of ischemic stroke in our study most common was atherosclerotic 69(53.1%), followed by cardioembolic 21(16.1%), other determined cause 17(13.1%) including Takayasu's arteritis in one female, and undetermined cause 23 (17.7%) which was similar to other studies which have reported 21%–48% of strokes in young are due to atherosclerotic large artery disease, 13%–35% due to cardio-embolism and 7%–40% are cryptogenic.[19] Takayasu's arteritis as cause of young stroke is reported in Indian adolescents.[20] In our study rheumatic heart disease was most common cause of cardioembolic stroke as reported by other studies.[19] Haemorrhagic stroke was diagnosed in 26% patients in our study which was similar to a British study which reported 20% incidence although other studies have reported higher proportion in young (40%–55%) as compared to older groups (15%–20%). Race, sex, ethnic difference as well as geographic location is found to effect type of stroke as well as outcome. Eighteen patients (9%) were having CVST in our study with female preponderance

similar to other studies which have reported incidence from 2%[2] to as high as 16.3%.[21] Although infection is a major cause of CVST in young, Most of the patients were postpartum and none had underlying infection in present study. Among risk factors for ischemic stroke 13% were newly diagnosed diabetics at time of presentation, similar to other studies. [17,22] Smoking was a significant risk factor for stroke in young in our study, besides this hypertension was present in 30% similar to other studies. [16,17,23] Proportion of patient who underwent vasculitic work up was low due to financial constraints of patient so we could not make any meaningful analysis. Elevated homocysteine was diagnosed in 15% patients of ischemic stroke in our study similar to a US based study.[24] Diagnostic evaluation of young stroke depends on multiple factors as aetiology is different from older stroke. Thorough history taking, clinical examination and streamlined investigations can be the game changer in young stroke management.

Conclusion

With increasing burden of young stroke globally this needs prompt attention. As ours was a tertiary centre hospital based study, our sample size might not be the actual representative of population. There is a need for population-based studies in future, which can provide information on underlying aetiology and incidence rates in different populations. This can contribute towards upliftment of management strategies of young stroke which can produce rewarding results.

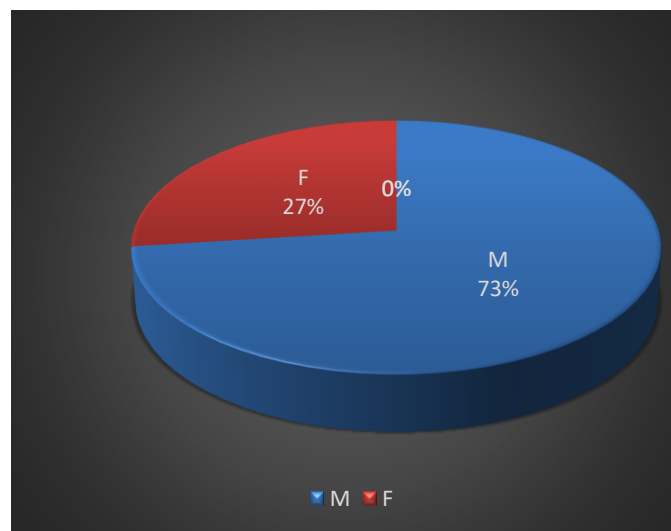


Fig 1 : Pie Chart showing gender distribution. M=Male, F=Female

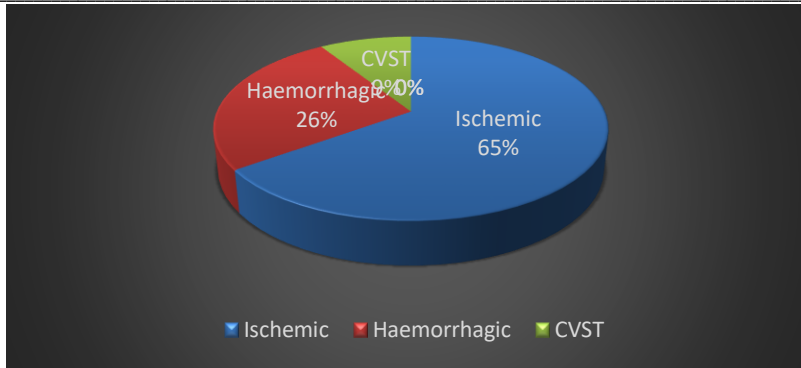


Fig 2: Pie-chart showing distribution of stroke subtype in study population. CVST= Cerebral Venous Sinus Thrombosis

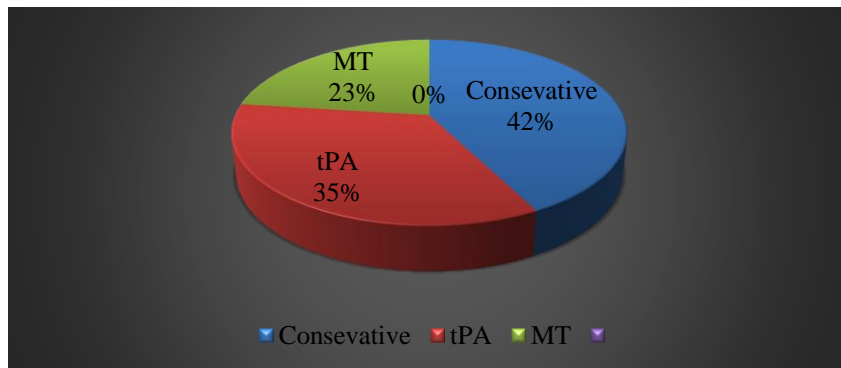


Fig 3: Pie chart showing treatment strategy in patients of ischemic stroke. MT=Mechanical Thrombectomy; tPA=Tissue Plasminogen Activator

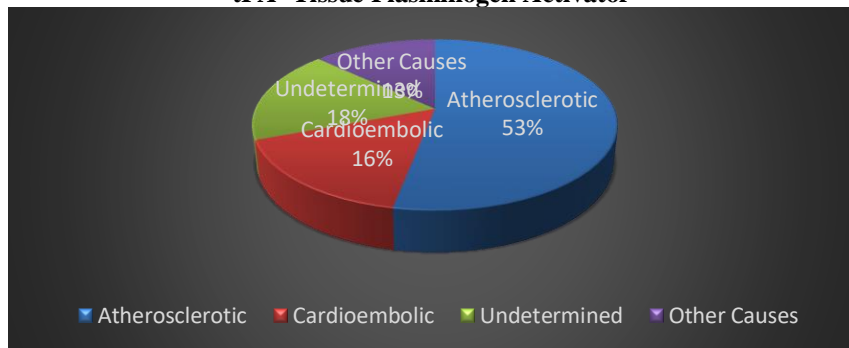


Fig 4: Pie chart showing aetiological subclassification of ischemic stroke in study group

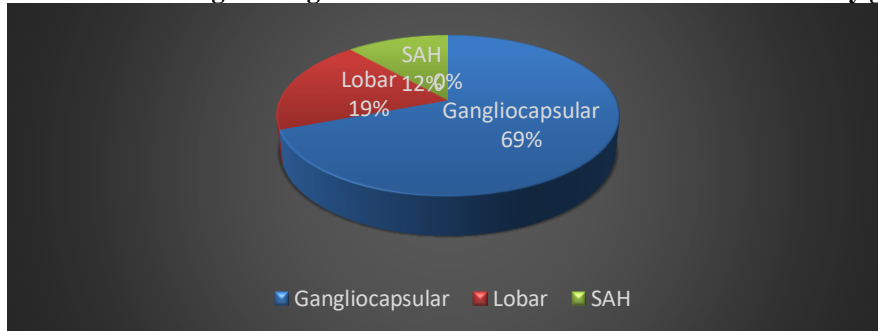


Fig 5: Pie chart showing frequency of involvement of site in Haemorrhage patients. SAH=Subarachnoid Haemorrhage

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