

## Risk Factors, Etiology, and Outcome of Acute Stroke in Young Adults in a Tertiary Care Centre

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**INTRODUCTION:** Strokes in young are reported as being uncommon, comprising 10%–15% of all strokes<sup>1</sup>. However it has a major impact on the quality of life for the individual and society .we aimed to evaluate risk factors, etiology, and morbidity at the time of discharge in patients with stroke under the age of 45 years.

### METHODS

It is a hospital-based prospective observational study of 60 stroke patients Patients with Acute CVA aged 15–45 over 1 year were included in the study. Risk factors like smoking, alcohol, hyper coagulable states, heart diseases, dyslipidemia ,DM, hypertension, Vasculitis and AV malformations were analysed and documented.Morbidity was assessed with MRS scoring during admission and at discharge. Data was analysed using appropriate statistical tools.

### RESULTS

Although male patients predominate in our study , females outnumber males significantly at ages under 30. Alcoholism(65%) and smoking(60%) were the most frequent risk factor followed by hypertension(53%) and diabetes mellitus(45%). Cardioembolism caused 13.4% of all strokes. No definite etiology was found in 16%, whereas other causes of stroke, including dissection (6.7%), were documented. At the time of discharge, the disability scoring (MRS) was done.Most patients (90% of survivors) were independent.Out of 60,16 had succumbed to the illness 27 had moderate to severe disability and the rest had mild disability at the time of dischargeThe outcome was largely dependent on the etiology and the extent of CNS damage.

### CONCLUSION

There are gender and age-related differences regarding risk factors and causes of stroke in young patients.With appropriate treatment and intense rehabilitation,survival and outcome is generally favorable in this study group.

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## I. Introduction

Stroke is the most common neurological condition causing long-term disability and has enormous emotional and socioeconomic consequences in patients, their families and health services<sup>2</sup>. The estimates from Indian Council of Medical Research (ICMR) indicate that in 2004 there were 930,985 cases of stroke in India with 639,455 deaths and 6.4 million disability adjusted life years (DALY) lost<sup>2</sup>.Age has the strongest association with the incidence of stroke. The age-specific incidence of stroke increases progressively with increasing age. In a systematic review of 15 population-based stroke incidence studies, the rate of total stroke for those aged less than 45 years ranged from 0.1-0.3 per 1000 person years, while for those aged 75-84 years, the range was 12-20 per 1000 person years in most studies. Strokes in young are reported as being uncommon, comprising 10%–15% of all strokes<sup>3</sup>. However it has a major impact on the quality of life for the individual and society .However, the impact of stroke on the individual family and society is strongest when it affects a young individual<sup>3</sup>.

## II. Materials and methods

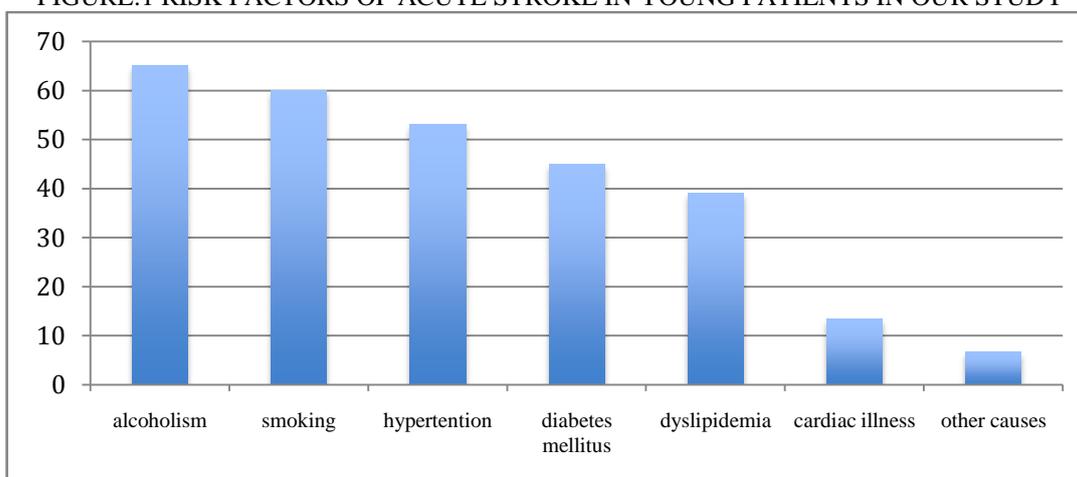
We aimed to evaluate the risk factors, etiology, and morbidity at the time of admission and discharge in patients with acute stroke in the age of group of 15 to 45 years.It was a hospital-based prospective observational study of 60 stroke patients,that was carried out in Madras institute of neurology,Madras medical college,Chennai. Patients with Acute CVA (both ischemic and hemorrhagic) aged 15–45 years attending neurology outpatient department and those admitted in the neurology and general medical ward in the last one year were included in the study.Patients with Acute CVA in the age group of less than 15 yrs and more than 45 years were excluded in from the study.Patients with neurological disorders other than CVA in the age group of 15 to 45 years were excluded from the studyA detailed history including age sex and demographic details

were taken. Risk factors like smoking, alcohol, hypercoagulable states, heart diseases, dyslipidemia, DM, hypertension, vasculitis and AV malformations were analysed and documented. A thorough neurological examination was carried out. Morbidity was assessed with MRS scoring during admission and at discharge. All the data was entered in a pre structured proforma specially designed for this purpose and was analysed using appropriate statistical tools.

### III. Results

Out of the 60 patients, 23(38.3%) were between the age group of 15 to 30 and 37(61.6%) were in the age group of 30 to 45. The mean age of patients were identified to be 36.7.39 (65%) were male and 21(35%) were females. 42(70%) patients had hemorrhagic stroke while the rest(30%) had infarcts. Although male patients predominate in our study, females outnumber males significantly at ages under 30(14), most of them(8) being in the peripartum period. Of the risk factors, Smoking was identified in 36(60%) patients and dyslipidemia was identified in 23(39%). Alcoholism was noted in 65% of patients(38). Small vessel disease was identified as cause of stroke in 25%, whereas cardioembolism caused 13.4% of all strokes. Hypertension was seen in 32(53%) patients while diabetes mellitus was seen in 27(45%) patients. No definite etiology was found in 33.6%, whereas other causes of stroke, including dissection(1), vasculitis(2) nephritic syndrome (1) were documented in 6.7% of patients. At the time of discharge, the disability scoring (MRS) was done. Out of 60, 16 had succumbed to the illness 27 had moderate to severe disability and the rest had mild disability at the time of discharge.

FIGURE:1 RISK FACTORS OF ACUTE STROKE IN YOUNG PATIENTS IN OUR STUDY



### IV. Discussion

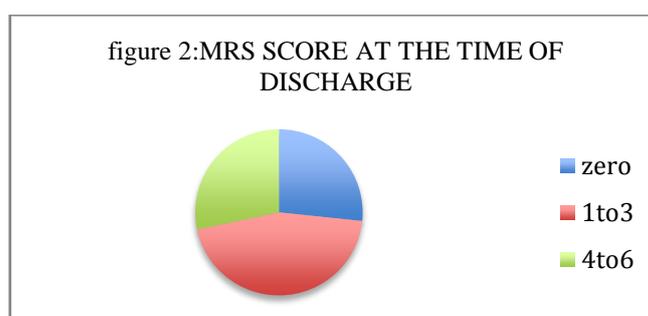
Although male patients predominate in our study, females outnumber males significantly at ages under 30 which is in concordance with sex distribution of the Helsinki stroke registry and with a study by Nayak et al<sup>7</sup>. In a study by Nayak SD et al, 177 patients with first ever ischemic stroke (age group 15-45 years) based on hospital data, 76% were male and 24% female patients. Smoking and alcoholism were the risk factors identified in majority of patients in our study group followed by hypertension and diabetes mellitus whereas in a study by Nayak SD et al hypertension was present in 18% of the patients, whereas diabetes mellitus was present in 7% only<sup>4,7</sup>. Sixty nine percent of male patients were smokers. Dyslipidemia in the form of elevated cholesterol was present in 17% and increase in triglycerides was observed in 42% patients. In another study of stroke in the young from Southeast Asia, the most common risk factors observed were hyperlipidemia (53.1%), smoking (49.8%), hypertension (45.8%) and a family history of stroke (29.3%)<sup>5</sup>.

Analysis of prevalence of risk factors in studies of stroke in young from the west reveals prevalence of hypertension from 20 to 60%. In Helsinki Young Stroke Registry which included 1008 first ever patients of ischemic stroke in the age group of 15-49 years, hypertension, smoking and dyslipidemia with high total cholesterol emerged as important risk factors<sup>6</sup>. The prevalence of hypertension increased with increasing age and was seen in 28.3% of patients in 15-44 year age group. Similarly, 38.4% of patients in 15-44 year age group had increased level of cholesterol. Smoking as a risk factor was observed in around 47% patients in both the age groups. In a study of 203 patients of stroke in age group of 15-45 years from Switzerland, hypercholesterolemia (39%) and smoking (46%) were important risk factors<sup>1,2</sup>. However, hypertension was present in 19% patients only. Increased C reactive protein level was observed in 36% patients.

In a study on stroke in young from Sri Chitra Tirunal Institute of Medical Sciences and Technology (SCIMST), Trivandrum, 25.2% patients had cardioembolic stroke, 12.6% had large artery atherosclerosis and

7.5% had lacunar infarcts. Strokes due to other determined etiology were 11.2% (7.0% arterial dissection, and one patient each with lupus erythematosus, primary antiphospholipid antibody syndrome and protein S deficiency)<sup>8</sup>. Four patients had stroke due to other causes (one case each of Moyamoya disease, Takayasu's arteritis, fibromuscular dysplasia and nephritic syndrome)<sup>8</sup>. where as in our study cardioembolism caused 13.4% of all strokes. No definite etiology was found in 33.6%. Other causes of stroke, including dissection were documented in 6.7%.

Putaalaaet *al.*, in a study of stroke in young from Helsinki, reported that 59% of patients with stroke of other determined etiology had cervical or intracranial artery dissection. Out of 155 patients with dissection, 80 had vertebral artery dissection and 67 had internal carotid artery dissection. Other causes of stroke like antiphospholipid antibody syndrome, factor V Leiden mutation, proteins C and S deficiency, antinuclear antibody positivity, systemic lupus erythematosus, fibromuscular dysplasia, migraine-related stroke and other vasculitis were observed in 1-2% of patients.



MRS SCORE @DISCHARGE	NOPTS
ZERO	16
1-3	27
4-6	17

Out of 60 patients in the study group, 16 had succumbed to the illness, 27 had moderate to severe disability and the rest had mild disability at the time of discharge. Of those with mortality, 10 had hemorrhagic and 6 had ischemic stroke. In the study, Poisson's team found that stroke mortality in young adults remains rare in the range of .93 per 100,000 population for intracranial hemorrhagic stroke to .70 per 100,000 for ischemic stroke<sup>1</sup>. However, while hemorrhagic stroke in young adults declined during that period, ischemic stroke increased by 11% from .60 to .67 per 100,000 person years.

## V. Conclusion

Stroke in young adults is a major public health issue. Prevention is primary treatment, aimed at decreasing morbidity and mortality, no specific recommendations are available. Considering the increasing incidence of stroke in the young, there is need for more research in order to reduce this burden.

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