# STUDY OF ACUTE ISCHAEMIC STROKE IN ELDERLY

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## ABSTRACT

### BACKGROUND
Stroke affects 16.9 million people annually and the greatest burden of stroke is in low- and middle-income countries where 69% of all strokes occur. Stroke risk factors, mortality and outcomes differ in developing countries as compared to the developed world. Stroke incidence increases with increasing age and has an impact on daily living in many areas with increasing life expectancy. Old people constitute the majority of stroke victims.

### MATERIALS AND METHODS
A total of 101 elderly patients of acute ischaemic stroke fulfilling inclusion and exclusion criteria who were admitted to M.S. Ramaiah Hospital between January 2014 and June 2016 were included in the study. Outcome was assessed by National Institute of Health Stroke Scale (NIHSS) score at admission, day 5 and at discharge, duration of hospital stay and inpatient mortality.

### RESULTS
The mean age of the patients was 67.70±8.77 years. 67.3% of the patients were males. Hypertension (72.3%), diabetes mellitus (51.5%) and dyslipidaemia (48.5%) were the most common co-morbid conditions. Mean NIHSS score at the time of admission was 12±5.1, on day 5 was 8.47±4.75 and at the time of discharge was 3.27±3.33. Mean duration of hospital stay was 9.01±6.45 days and mortality was seen in 4 patients (4%). Most common site for infarct was in the middle cerebral artery territory (71.71%).

### CONCLUSION
With continuing rapid increase in life expectancy and improvement in medical care, the proportion of elderly with stroke will rise. Therefore, stroke in the elderly is rapidly becoming a major public health concern.

### KEYWORDS
Acute Ischaemic Stroke, NIHSS Score, Elderly.

## BACKGROUND
Cerebrovascular Accident (CVA) is one of the leading causes of death and disability. Age is the most significant non-modifiable risk factor for ischaemic stroke. The incidence of stroke increases with age, which correlates inversely with clinical outcome.[1] It is the leading cause of long-term disability and survivors experience varying degrees of chronic disabilities that limit their cognitive and functional abilities affecting daily life activities.

In India only limited prospective data is available about the burden of stroke in individuals over the age of 60 years. Hence, the present study was carried out to study the profile of first ever acute ischaemic stroke in elderly patients.

### Aims and Objectives of the Study
To study the profile of first ever acute ischaemic stroke in elderly individuals.

### MATERIALS AND METHODS
A total of 101 consecutive elderly patients admitted to M.S. Ramaiah Hospitals with acute ischaemic stroke during the period of January 2014 to June 2016 were included in the study.

### Inclusion Criteria
An elderly patients aged ≥60 years presenting with first ever ischaemic stroke.

### Exclusion Criteria
Elderly patients with haemorrhagic stroke, posterior circulation stroke, recurrent stroke and venous strokes were excluded from the study.

### Methods of Data Collection
101 consecutive elderly patients admitted with acute ischaemic stroke were included in the study. All patients were evaluated by physician and the diagnosis of acute ischaemic stroke was made by clinical examination and

confirmed by Computed Tomography (CT) and/or Magnetic-Resonance Imaging (MRI) brain. Outcome was assessed by National Institute of Health Stroke Scale (NIHSS) score at admission, day 5 and at discharge, duration of hospital stay and inpatient mortality. Complete blood count, fasting blood glucose, lipid profile and renal function tests were sent on admission.

## Statistical Analysis
Data was entered in MS Excel and analysed using SPSS version 17. All the continuous variables were described using mean and standard deviation. All the qualitative variables were expressed as percentage.

## RESULTS
The mean age of the patients was 67.70±8.77 years. 67.3% of the patients were males. Hypertension (72.3%), diabetes mellitus (51.5%) and dyslipidaemia (48.5%) were the most common co-morbid conditions (Table 1). Mean NIHS score at the time of admission was 12±5.1, on day 5 was 8.47±4.75 and at the time of discharge was 3.27±3.33. Mean SBP was 145.31±25.39 and mean DBP was 84.89±15.82 mm of Hg. Mean duration of hospital stay was 9.01±6.45 days and mortality was seen in 4 patients (4%). Basic laboratory parameters revealed mean random blood sugar of 198±119.48, mean HbA1c-8.31±2.42, mean serum cholesterol-203.79±46.73, mean serum triglyceride-193.43±138.41, mean serum LDL-126.92±38.69 and mean serum HDL-37.69±8.13. Most common infarct was in the middle cerebral artery territory (71.71%) (Table 3).

| Co-Morbid Condition | Number (n=101) | Percentage |
|---|---|---|
| Hypertension | 73 | 72.3 |
| Diabetes mellitus | 52 | 51.5 |
| Dyslipidaemia | 49 | 48.5 |
| Ischaemic heart disease | 13 | 12.9 |
| Heart failure | 9 | 8.9 |
| Chronic kidney disease | 4 | 4 |

*Table 1. Co-Morbid Conditions*

| Laboratory Parameter | Mean±SD |
|---|---|
| Haemoglobin (g/dL) | 13.04±1.7 |
| Total count (cells/mm$^3$) | 8557.57±3085 |
| Platelet count (cells/mm$^3$) | 239000±68641 |
| Blood urea nitrogen (mg/dL) | 17.18±12.35 |
| Serum creatinine (mg/dL) | 1.16±0.87 |
| Random blood sugar (mg/dL) | 198±119.48 |
| HbA1c (%) | 8.31±2.42 |
| Serum cholesterol (mg/dL) | 203.79±46.73 |
| Serum triglyceride (mg/dL) | 193.43±138.41 |
| Serum LDL (mg/dL) | 126.92±38.69 |
| Serum HDL (mg/dL) | 37.69±8.13 |
| Serum sodium (mmol/L) | 136±6.68 |
| Serum potassium (mmol/L) | 4.23±0.62 |
| Serum cortisol (mcg/dL) | 16.33±1.53 |

*Table 2. Basic Laboratory Parameters*

| | Number (n=101) | Percentage |
|---|---|---|
| MCA | 71 | 71.71 |
| MCA+ACA | 15 | 15.15 |
| ICA | 11 | 11.11 |
| ACA | 2 | 2.02 |
| Bilateral | 2 | 2.02 |

*Table 3. Distribution of Stroke*

## DISCUSSION
Cerebrovascular Disorders (CVD) are on the rise in India due to rapid change in lifestyle. The prevalence of stroke ranges from 334-424/1,00,000 in the urban areas and 84-262/1,00,000 in the rural areas in India. The incidence is about 119-145/1,00,000 based on recent population-based studies.[2] Stroke is one of the leading causes of death in India.[3] Age is the single most important risk factor for stroke. For each successive 10 years after age 55, stroke rate more than doubles in both men and women.[4] Advancing age has a major negative impact on stroke morbidity, mortality and long-term outcome. Older adults (over 65 years) have increased chance of dying in two months after stroke.[5] The burden of stroke is comparatively greater in Asian countries than in the Western world.[6]

In our study, the mean age of the patients was 67.70±8.77 years. The proportion of very old subjects among all the patients with first ever stroke was 11%. This is comparable with study done by Olindo et al where 17% of the patients were very elderly.[7] As in many studies, we report a higher incidence in men than in women in our elderly age group patients. The incidence of stroke is higher in men than in women. The influence of sex-specific risk factors on stroke incidence and mortality is largely unknown.

In our study, hypertension was the most common co-morbid condition and 73 subjects (72.3%) were hypertensive. Similar findings were noted by E Auriel et al where 74.71% of the patients had hypertension.[8] Hypertension and cerebrovascular accident are strong independent risk factors for the development of cognitive impairment and dementia. Onset of new cognitive decline is common following a large and multiple ministrokes.[9]

Low-density lipoprotein cholesterol, high-density lipoprotein cholesterol and triglycerides each appear to have individual effects on stroke risk. Statins decrease the risk of cerebral infarction in patients with coronary disease, diabetes, hypertension and hypercholesterolemia. Cholesterol is a modifiable risk factor for stroke and statins are excellent agents for prophylaxis and acute therapy.[10]

Mortality due to stroke accounts for a significant proportion in the community in India. Stroke is one of the leading causes of death in India. Joshi et al determined mortality due to chronic diseases through verbal autopsy in a population of 1,80,162 residing in 45 villages of Andhra Pradesh. Stroke was the cause of death in 13%, which was very similar to death due to coronary artery disease (14%).[3]

## CONCLUSION
There is remarkable increase in the proportion of the elderly population in India and most of the strokes occur in people

above 60 years of age. As a consequence of this, there is a very high prevalence of older adult stroke survivors with subsequent disability and dependence.

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