



## STUDY TO ASSESS THE PREVALENCE OF STROKE IN THE KATTANKULATHUR BLOCK OF KANCHEEPURAM DISRICT, TAMIL NADU, INDIA.

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### ABSTRACT

Stroke is a non-communicable disease with significant socioeconomic consequence worldwide. According to a release by the World Health Organization (WHO) stroke accounts for 10.8% mortality and 3.1% of disease burden worldwide. Commonly observed deficits after stroke are loss of motor control on affected side, cognitive and perceptual dysfunction, speech and communication problems and dependent in functional activities. There are very less data available on prevalence of stroke in Tamil Nadu. Such data are important for providing rehabilitation services in community setting. The study is aimed to determine the prevalence of stroke in the kattankulathur block. This is population based descriptive survey study and the investigator carried out door to door survey with help of Stroke symptom questionnaire. In addition to door to door survey stroke patients were collected from other resources also. All the identified patients were cross examined with CT and MRI. The results indicated that The Prevalence of stroke patient in kattankulathur block was  $(257/197596) \times 100000 = 130$  per lakh, 1 out of 769 population affected by stroke. Males are more affected than females, left hemiplegics are more than right and hypertension was predominant cause of stroke. The result from this study help us to assess the rehabilitative need and to estimate the burden on stroke in rural area. The the data was analyzed using Descriptive statistics (SPSS- version 19). The Prevalence of stroke patient in kattankulathur block was calculated using the formula Total number of stroke patients divided by total population Multiplied by 1000

**KEY WORDS:** Stroke, Prevalence, Survey, Rural, Rehabilitation, Tamil Nadu



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## INTRODUCTION

Stroke is a global health problem. It is the second commonest cause of death and fourth leading cause of disability worldwide.<sup>1</sup> Approximately 20 million people each year will suffer from stroke and of these 5 million will not survive.<sup>2</sup> In developed countries, stroke is the first leading cause for disability, second leading cause of dementia and third leading cause of death. Stroke is a leading cause of functional impairments, with 20% of survivors requiring institutional care after 3 months and 15% - 30% being permanently disabled.<sup>3</sup> Stroke is devastating and a life-changing event that affects not only the person who has stroke, but their family and caregivers. In many high-income countries, stroke management has changed substantially in the past two decades. The World Health Organization (WHO) definition of stroke is: "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin."<sup>4</sup> A stroke is caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients to the brain, causing damage to the brain tissue. Stroke is a clinical syndrome divided into two broad categories that define its path physiology. Ischemic strokes are caused by sudden occlusion of arteries supplying the brain, either due to a thrombus at the site of occlusion or formed in another part of the circulation. It account for 50%–85% of all strokes worldwide. Stroke leads to loss of motor, sensory function on one side of body, apart from cognitive and perceptual deficits. The visual perceptual deficits influence visual motor integration which is considered to be the pre requisites for ADL. The influence of visual perceptual deficits on ADL is comparatively high in patients with Left Hemiparesis than with the Right Hemiparesis.<sup>5</sup> In India, the prevalence of stroke in younger individuals is high (18-32% of all stroke cases) compared with high-income countries.<sup>6</sup> Stroke prevalence among the elderly in rural India was 1.1% and urban India was 1.9%. It is believed that the average age of patients with stroke in developing countries is 15 years younger than that in developed countries.<sup>7</sup> Indian studies have shown that about 10% to 15% of strokes occur in people below the age of 40 years.<sup>8</sup> Ischemic stroke is the most common subtype followed by hemorrhagic and embolic stroke and 21-48% of stroke in young is caused by atherosclerotic large artery occlusive disease.<sup>9</sup> Men are more likely to have a stroke than women: the male/female sex ratio for India is 7:1.<sup>10</sup> This may be due to differences in risk factors such as smoking and drinking which are more prevalent among men in India compared with women.<sup>11</sup> The mean onset of stroke for men in India ranges from 63-65 for men and 57-68 for women.<sup>6,12,13</sup>

### **Need for the study**

First community based survey in south India was conducted in Vellore on stroke, Tamil Nadu during the period 1969 – 71. followed by study in Rohtak in north India during 1971-74. According to the Asian Acute Stroke Advisory Panel, India is still ranked among the countries where the information on stroke is minimal.<sup>14</sup>

Now that the stroke incidence and prevalence has increased markedly, the need to assess the prevalence has to be given priority. The investigator observed that there was increase in number of Stroke patients visiting outpatient unit from villages in Kattankulathur block. There are no published data on prevalence of stroke in kancheepuram district. Hence the investigator developed interest to study the stroke prevalence in Kancheepuram district

## MATERIALS AND METHODS

### **Stroke symptom Questionnaire(SSQ)**

The Stroke symptom questionnaire is standardized screening tool useful to identifying community-dwelling stroke patients. The screening procedure was a face-to-face interview with one of the people living in the house, generally the spouse/children, who answered questions about stroke symptoms. The form included seven questions regarding five components on stroke symptoms, in relation to limb weakness (arm or leg), facial weakness, speech problems, sensory disorders and impaired vision. The Stroke symptoms questionnaire included socio demographic characteristics, frequent comorbidities and history of other medical problems. To facilitate comprehension, two pictures showing the appearance of facial weakness and the most common visual impairments in stroke patients were presented by the interviewer. The questionnaire also asked the patient whether he/she had had a stroke and, if the answer was yes, where he/she had been treated by a doctor, whether a computed tomography (CT) scan had been performed and what type of stroke the patient had had. The investigator took the questionnaire result to be positive when the participant gave positive responses to two or more questions, either about stroke symptoms (out of five components) or presence of stroke (one question), with confirmation from a physician; or when he/she gave at least three positive responses (out of the six questions), whether confirmed by a physician or not.

### **STUDY METHOD**

Institutional ethical committee approval was obtained from SRM University and consent letter from the participant was also obtained by the investigator before starting the study. The investigator with help of research assistants carried out door to door survey with help of SSQ questionnaire. Investigator trained the research Assistants for the survey. Prior to the survey they were given comprehensive training to enable them to identify stroke patients. In addition to door to door to survey stroke patients was collected from other resources also. All the identified patients were cross examined with CT and MRI. Clinical evaluations were conducted by different therapist, who was blinded to the results from the questionnaire. The sensitivity was 72.2%, specificity was 94.4%, positive predictive value was 92.9% and negative predictive value was 77.3%. The positive likelihood ratio was 12.9, the negative likelihood ratio was 0.29 and the kappa coefficient was 0.67. Limb weakness was the most sensitive symptom, and speech problems were the most specific

**DATA ANALYSIS**

The Data collected was scored and tabulated .The data was entered into master sheet and saved in EXCEL. Then the data was analyzed using Descriptive statistics (SPSS- version 19).The Prevalence of stroke patient in

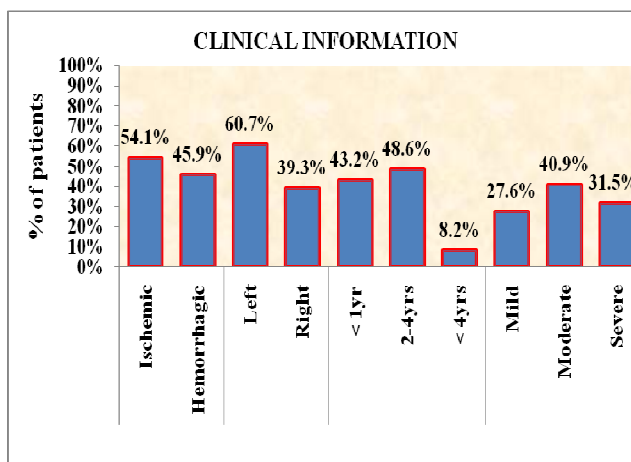
kattankulathur block was calculated using the formula number of stroke patients divided by total population X 1000 with 95% confidence interval 0.9(0.7 - 0.10).Frequency and percentage distribution was used to assess the demographic variables, clinical variables.

**RESULTS**

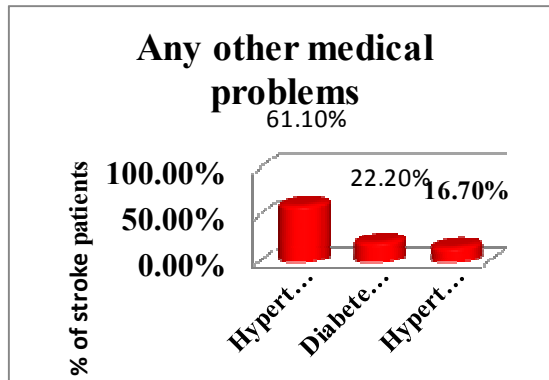
**Table 1**  
*Frequency and percentage distribution of demographic variables of the stroke patients. N=257*

Demographic variables	No. of stroke patients	%
<b>Age</b>	25 -35 yrs	14.8%
	36 -45 yrs	21.8%
	46 -55 yrs	26.1%
	56 -65 yrs	17.9%
	66 -75 yrs	19.5%
<b>Sex</b>	Male	70.8%
	Female	29.2%
<b>Marital status</b>	Married	71.6%
	Unmarried	12.8%
	Spinster/widower	12.1%
	Divorcee	3.5%
<b>Education</b>	Professional or honors	9.3%
	Graduate or post graduate	7.4 %
	Intermediate or Post high school diploma	11.3%
	High school certificate	11.7%
	Middle School	13.6%
	Primary school	8.3%
	Illiterate	28.4%
<b>Religion</b>	Hindu	72.4%
	Muslim	12.1%
	Christian	15.6%

**Graph 1**  
*Clinical information of stroke patients in kattankulathur block*



**Graph 2**  
**Any other medical problems among stroke Patients in kattankulathur block**



## DISCUSSION

The total population surveyed was 197596, and 257 stroke patients were identified. Prevalence of stroke was  $(257/197596) \times 1000 = 1.3$  per 1000. One out of 769 population having stroke with 95% confidence interval 0.9(0.7 - 0.10). This result is supported by the study conducted on India stroke factsheet updated in 2012.<sup>15</sup> According to this study the estimated prevalence rate for stroke ranges between 84/100,000 and 262/100,000 in rural. Demographic characteristic of stroke patients in kattankulathur block revealed that the majority of stroke patients 67(26%) belong to the age group of 46 – 55 years and only 46(17.9%) belong to age group 56 -65 years (Table 1). Men outnumbered women, 182 (70.8%) stroke patients were males and 75(29.2%) stroke patients were females. This result is supported by a study conducted on cerebrovascular disease in South Asia – Part I: A burning problem.<sup>16</sup> Results showed that Prevalence was found to be higher among men in comparison with women (male-to-female ratio, 1.43:1). With respect to marital status majority of stroke patients were 184(71.6%) and least were in the Divorce 9(3.5%). Considering educational status majority of the stroke patients were 73 (28.4%) were illiterate and 19 (7.4%) were in primary school and graduate level. Hindus were predominant 186 (72.4%) and 31(12.1%) were Muslims. Majority of stroke Patients 70(21.2%) were unemployed and only 2 (8%) were Professionals. Regarding Family Income, majority of stroke patients 64(24.9%) were in the income group ranging from Rs.8010/- to Rs.12019/- and 9(3.5%) belong to family income Rs.1600. With respect to type of family in study group majority of stroke patients 139(54.1%) belong to joint family and 118 (45.9%) belong to nuclear family. Regarding number of family members majority 160(62.3%) had 2-4 members in their family and 97 (37.7%) had 5-7 members in three family. Considering the Bread winner majority 99(38.5%) of stroke patients and children were bread winner and 64(24.9%) of spouse were bread. With respect to the distribution of clinical variable, majority of stroke patients belong to ischemic type 139(54.1%) and 118(45.8%) belong to hemorrhagic type. This result is supported by a similar study conducted on Epidemiology of stroke in India.<sup>14</sup> The results showed that cerebral infarct was 68% and cerebral hemorrhage was 32%

cases. Majority of stroke were Left sided 156(60.7%), and right sided stroke patients were 101(39.3%). This result is supported by a study on Hemispheric Differences in Ischemic Stroke: Is Left-Hemisphere Stroke More Common<sup>17</sup> Study concluded that Left-hemispheric strokes (54%) were more common than right-hemispheric strokes (46%;  $p=0.0073$ ). Based on duration of illness majority of stroke patients belong to 2-4 years time 125(48.6%), next group of patients belong to less than 1 year 111(43.2%). And least was in duration of more than 4 years 68(26.5%). Majority of patients were moderately affected 105(40.9%), mild was 71(27.6%) and severe was 81(31.5%) (graph 1). Majority of stroke patients had hypertension 157(61.1%) and 57(22.2%) had diabetes mellitus, 43(16.7%) had both hypertension and diabetes mellitus. This result is supported by a study on Stroke Epidemic in India: Hypertension-Stroke Control Programme is Urgently Needed.<sup>18</sup> The results showed that the risk factors identified were hypertension alone in 40%, hypertension with diabetes in 25%, and hypertension with other risk factors (raised cholesterol, ischemic heart disease) accounted for another 20%. (graph 2)

## CONCLUSION

Conducting epidemiological survey in a developing country like India is an intimidating task. Yet several population-based surveys on stroke were conducted from different parts of India, but this survey is first population study on stroke in kattankulathur block, kancheepuram district, Tamil Nadu. Majority of stroke patients belong to age group 46 -55 yrs and approximately 60% of stroke occur in most productive age group. Hypertension is by far the most common risk factor followed by Diabetes mellitus and ischemic strokes are more common than hemorrhagic strokes, thus suggesting strong relationship between blood pressure and ischemic stroke. Apart from finding stroke prevalence, the incidence and the risk factors should also be determined to delineate the natural course of the stroke, and to identify consequent disabilities, their socio-economic impact on quality of life, so that appropriate preventive measures like creating awareness to prevent stroke and remedial measures like rehabilitation of stroke patients in community level could be taken.

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**CONFLICT OF INTEREST**

Conflict of interest declared none.

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