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PREVALENCE OF STROKE IN RURAL POPULATION- A COMMUNITY BASED STUDY

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ABSTRACT

Stroke is the second leading cause of death and major cause of morbidity worldwide. To find out the prevalence rate of stroke among the rural population in Tamilnadu and to describe the risk factors profile of stroke patients. A descriptive cross sectional study was carried out using predesigned structured proforma. The prevalence of stroke among the rural population Orathur in the year 2014 was found to be 1.5 per 1000. Out of 73 cases of stroke 96 % had hemiplegia. Male to female ratio of stroke cases was 8:1. 59% of them were obese. Out of the 73 cases, 69 had atleast anyone of the comorbid conditions. 74% had hypertension, 57.5% had diabetes, 11% had cardiac diseases. 4.1% had all the three co-morbid conditions. The prevalence of stroke in the rural population, present study appears to be less than in many other countries, this may be due to lower life expectancy in India with a larger younger group population than in developed countries.

Key words: Prevalence, Stroke, Risk factors.

INTRODUCTION

Non-communicable diseases (NCDs) in developing countries have risen sharply in recent years. In the past few decades significant change have occurred in the pattern of health and disease in many developing countries these changes have resulted from the effects of social economic and technological developments as well as specific public health and population programs [1]. It has now been projected that by 2020 NCD will account for almost three quarters of all deaths and that 75% of deaths due to stroke will occur in developing countries.

Stroke is the second leading cause of death after ischemic heart disease and major cause of disability worldwide. Stroke is also predisposing factor for epilepsy, falls and depression in developed countries [2] and is leading cause of functional impairments with 20% of survivors requiring institutional care after three months and 15% to 30% being permanently disabled [3].

Three transitions have contributed to the emergence of the stroke epidemic in India: demographic, lifestyle and socioeconomic [4]. The demographic shift is characterized by increased life expectancy, lifestyle by a shift in food consumption and less physical activity and socioeconomic status with raising living standards by an urban elite who adopt western lifestyle [5]. The resulting effect of these transitions increases risk factors for stroke, many of which are modifiable.

Attributable causes are increased prevalence of hypertension (contributed by work related stress),altered food habits, aging and rising tobacco consumption. Only very few community based studies from rural area are available in literature review. Hence this study attempts to estimate the prevalence of stroke and to describe risk factors associated with stroke among rural population.

AIMS AND OBJECTIVES

- To find out the prevalence rate of stroke among rural population.
- To describe the known risk factors of stroke among the rural population.

METHODOLOGY

The community based descriptive cross sectional study on prevalence of stroke was conducted in Orathur PHC service area, Keerapalayam Block of Cuddalore

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district during the period of one year from January 2014 to December2014. This area was selected as it is one of the field practice area of the institution. The health needs of the people were met by a Primary Health Centre at Orathur and 7 subcentres. The population covered by the PHC and subcentres is about 48,955, distributed over 38 villages. In this study, the population surveyed were from 10655 households consisting of 54.02% of males and 45.98 % of females. The investigator himself carried out the survey. Since the same person carried out the survey, there was less chance for observer variation. The survey was carried out in the afternoon and in the evening ,as most of the respondents were be available after finishing their agricultural work. The houses which were locked during the first visit of the investigator, were visited and interviewed during subsequent visits. The proposed date of next visit of the investigator was informed to the neighbours, thus enabling the investigator to complete all the households in that area.

Predesigned structured proforma was used to collect the basic socio demographic variables and selected risk factors of stroke. The clinical assessment and neurological examination of stroke cases were done by the investigator using structured proforma. The information of occurrence of stroke was obtained from VHN during the visit to PHC every Tuesday (during review meeting of PHC) and through phone.

The collected data were entered into excel spread sheet in microsoft office version 2007 and were analysed for frequency distribution and association using SPSS version21

RESULTS

In the present community based study a total population of 48945 was surveyed and 73 cases of stroke were detected. Among them 58 were old cases and the remaining 15 are new cases, the overall prevalence of stroke is found to be 1.5 per 1000 population. The Crude prevalence of stroke is 150 per one lakh population.

Mean age of onset for stroke irrespective of sex is 63.19 yrs. For males and females the mean age is 62.8yrs and 66.5 yrs respectively which is not statistically significant (Table 2). There is no statistical difference in mean age of onset between old and new stroke cases and it was found to be 63.3 and 63.1 years respectively. The male female ratio of stroke cases is 8:1.

Out of 73 stroke cases 96% had hemiplegic,34% of them had speech difficulties and 24.7% had facial nerve involvement 87.7% (fig 1) of stroke cases were immediately hospitalized within golden period of 6 hours, 46% and 24.7% suffered from moderate and severe disability.

Out of 73 cases, 69(94.5%) had co-morbid conditions like hypertension, Diabetes mellitus and cardiac diseases, that is 74% had hypertension, 57.5% had diabetes, 11% had cardiac diseases. All the three conditions were present in 4.1% of stroke cases, both hypertension and diabetes are present in 41.1% of stroke cases. 28.8% of stroke cases had previous history of TIA, 30.1% of them had family history of stroke , 75.3% of them are consuming tobacco in both forms and 53.4% are alcoholic. 59% of the stroke cases are obese with BMI more than 30.

Among the 28.8% of stroke cases who had previous history of TIA 13.7% had history of TIA episodes before stroke attack (Table 3).

Table 1. Prevalence of stroke among rural population of India

Prevalence of stroke	
Crude prevalence of stroke	150/100000 population
Age adjusted stroke prevalence of stroke	440/100000 population

AGE ADJUSTED ACCORDING TO 2011 US POPULATION

Table 2. Mean age of onset of stroke among rural population of India

Gender	Age in years
Both male & female	63.2±6.9
Males	62.8±6.8
Females	66.5±7.5

t value = -1.344, p value = 0.214.

Table 3. Distribution of risk factors among the stroke cases in study population

Variable		Frequency(%)
Age	46 – 60	10 (13.7)
	61 – 75	60 (82)
	>76	3 (4.1)
Sex	Male	65 (89)
	Female	8 (11)
Family history of stroke	Yes	22 (30.1)
	No	51 (69.9)
H/O TIA	Yes	10 (13.7)
	No	63 (86.3)

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Hypertension	Yes	54 (74)
	No	19 (26)
Diabetes mellitus	Yes	42 (57.5)
	No	31 (42.5)
Cardiac disease	Yes	8 (11)
	No	65 (89)
Tobacco usage	Current	19 (26)
	Ever	55 (75.3)
	Never	18 (24.7)
Alcohol consumption	Current	8 (11)
	Ever	39 (53.4)
	Never	34 (46.6)
Obesity	Yes	41 (56.2)
	No	32 (43.8)

Table 4. Prevalence of stroke in rural India ,earlier studies

Author	Year	Study Area	Study Population	Crude Prevalence / 100000	Age Adjusted Prevalence / 100000
Das sk	**1996**	**WestBengal**	**37286**	**126**	**---------**
Sahasp	**2003**	**WestBengal**	**20842**	**147**	**---------**
Gourie-devi	**2006**	**Karnataka**	**51055**	**165**	**262**

Table 5. Risk factor profile of stroke, in various studies

Variables	Prevalence of risk factors, India	Prevalence of risk factors, India	Prevalence of risk factors, India
Study	Meta-analysis	Tripathi All ages	Inter stroke (PAR with 99%CI)
Family h/o Stroke	NA	8%	NA
Past h/o TIA	NA	NA	NA
Smoking	12-39%	13% (females) 46%(Males)	18.9%
Alcohol	NA	22.5%	3.8%
Obesity	NA	6%-49%	26.5% (Abdominal Obesity)
Hypertension	85%	12%-40%	34.6%
Diabetes mellitus	15.5%	3%-12%	5.0%
Cardiac disease	12-27%	7% with AF	6.7%

Fig 1. Clinical signs among stroke patients

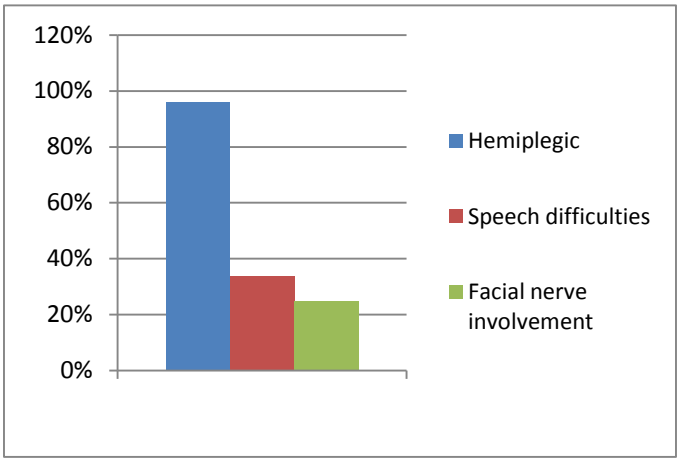
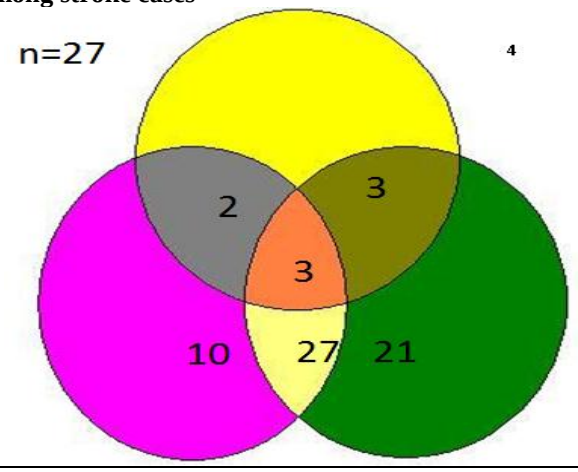


Fig 2. Venn diagram showing comorbid conditions among stroke cases



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DISCUSSION

Few prevalence studies of stroke have been done in India and abroad, and show wide variations. The prevalence of stroke in India shows a huge variation 147 – 922 / 100000 across diverse community based studies [6].

In several studies which used age standardization with the US population as reference, the prevalence of stroke ranged from 244-424 / 100000 population.

The crude prevalence of stroke in the present study was found to be150 per lakh population which is similar to the crude prevalence of stroke in West Bengal (147 per lakh population) [7] . It is also consistent with the study done by Dalal 2007 prevalence of stroke in India 90-222 / 100000 and is comparable with the overall age adjusted prevalence of stroke in India which was estimated to lie between 84-262 /100000 in rural area reported in stroke india fact sheet2012. but differs from Bombay study (842.3 / 100000) [8]. The Bombay study however was confined to the affluent society and their standard of living and life expectancy is comparable to that of developed countries. The population structure of the present study was however a mixed one including all segments of society.

The prevalence rate in present study was also much lower in comparison with the average worldwide prevalence rate which ranges between 500-800 / 100000. The low prevalence rate of stroke in this part of India may be due to shorter average life expectancy as compared to the west, and population at risk in India is smaller at present [9].

The mean age of onset for stroke in the present study is 63.19 yr, but data from Mumbai and trivandrum registry showed that the mean age of onset for stroke was 66 and 67 years, where as this is in contrast with the Bangalore study the (54.5 years) [10]. For males and females the mean age is 62.8yrs and 66.5 yrs respectively which is not statistically significant in the present study.

The male to female ratio of stroke cases is 8:1,which is similar to a study done by sethi 2002 (7:1),but in contrast to a study done in Bangalore (2: 1) ,the kolkatta study estimated male to female ratio as 1.7.

About co-morbid conditions among stroke patients is found to be 74% of hypertension, 57.5% of diabetes, 11% of cardiac cases. Among co-morbid conditions all three diseases are found to be 4.1% of stroke cases, both hypertension and diabetes are present in 41.1% of stroke cases.75.3% of them are consuming tobacco in both forms and 53.4% are alcoholic. 59% of the stroke cases are obese with BMI more than 30.

In the most of the epidemiological studies hypertension was found to be a major risk factor for stroke, it has been estimated that the hypertension is 54% of stroke cases in low and middle income countries, the present study also 74 % of stroke patients had hypertension. In the Mumbai registry,82.8 % of patients had hypertension.In the Trivandrum registry, nearly 85% had hypertension, half had diabetes mellitus.,26% had dyslipidemia and 26.8% of men smoked tobacco.

CONCLUSION

The prevalence of stroke in the rural population, present study appears to be less than in many other countries, this may be due to lower life expectancy in India with a larger younger group population than in developed countries.

Hypertension, diabetes mellitus, tobacco consumption, alcohol use are the important modifiable risk factors of stroke in the current study. Hence better control of hypertension, diabetes, avoidance of tobacco and alcohol usage would help in decreasing the prevalence of this highly disabling and often fatal disease.

India like other developing countries is in the midst of a stroke epidemic. There is a huge burden of stroke with significant regional variations. The prevalence data of this study is comparable with the prevalence study from south India but there is considerable variation with prevalence reported from elsewhere in the world. However, it is difficult to compare stroke prevalence in various studies because of the differences in diagnostic criteria, medical facilities, age and sex distribution. Ethnic, socio economic and dietary factors may also be responsible for this variance. The government is focusing on early diagnosis, management, infrastructure, public awareness, and capacity building at different levels of health care for all the non-communicable diseases including stroke. An organized effort from both the government and private sector is needed to tackle the rising stroke burden in India.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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