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Epidemiology of Stroke in a Rural Community in Kashmir

Authors
Dr Zarka Amin Masoodi[1], Dr Parvaiz A Shah[2]
[1]Consultant Medicine, Department of Health & Medical Education, Kashmir India
Email: *zarkaamin@yahoo.com*
[2]Professor & Head, Department of Medicine, Government Medical College Srinagar India
Email: *parvaizshah11@rediffmail.com*

Abstract

Background: *Stroke is a common neurological disorder and is becoming an important cause of premature death and disability in low income and middle income countries like India. Despite being preventable stroke is increasingly becoming a major health problem. Given the limited information on the prevalence and associated determinants of stroke, the aim of the present study was to assess its prevalence and identify correlates in Kashmir.*

Methodology: *A cross sectional study was conducted in a rural community of Kashmir. A culturally adapted version of the structured questionnaire developed on the basis WHO protocol was used for sociodemographic and other related data. Individuals with stroke were clinically evaluated with detailed history and thorough clinical examination. The data was statistically analysed using statistical package SPSS Window version 16.0. Chi square test was used for the comparison of categorical variables.*

Results: *A total of 6960 subjects constituting 51.75% males and 48.25% females participated in the programme. The mean age of participants was 42.62 years. Total of 57 subjects were found to have stroke yielding a prevalence rate of 8.19 per 1000 population. Out of 57 subjects 37 were males and 20 were females showing higher prevalence in males.The age specific prevalence rate for both the genders showed progressive increase in prevalence with advancement of age. Among the factors hypertension was found to be the leading risk factor associated with stroke.*

Conclusion: *The prevalence of stroke in the present study is higher than previously reported. The low socioeconomic status of the rural study site, and the continued militancy related stress may be the contributing factors for a relatively higher proportion of population at risk of stroke. With hypertension as the leading risk factor, community screening programmes to detect subjects with high blood pressure and. health education measures about awareness of early warning sign of stroke are vital for timely and effective therapy.*

Key words: *Prevalence, Stroke, Hypertension, Risk factors, Diabetes,*

Introduction

Stroke is the second leading cause of death worldwide and is considered as the third one in the United States and other industrialized countries [1,2]. The prevalence and incidence of stroke vary from community to community and from time to time worldwide [2]. Stroke is becoming an important cause of premature death and disability in low income and middle income countries like India, largely driven by demographic changes and enhanced by the increasing prevalence of key modifiable risk factors [3]. As a result developing countries are exposed to a double burden of both communicable and non communicable diseases. The poor are increasingly affected by stroke, because of both the changing population exposures to risk factors and most tragically not being able to afford the high cost for stroke care, thus posing serious medical, socioeconomic and rehabilitation problems [4].

In terms of population, India ranks second only to China [3]. Recent rapid socioeconomic changes have led to a concomitant change in people's life style, leading to work related stress and altered food habits raising the risk of hypertension. Those factors coupled with an increase in average life expectancy, are expected to have an impact on the occurrence of stroke disorder in India [4,5,6]. Tragedy of stroke lies in the fact that it does not always kill rapidly Majority of stroke survivors continue to live with disabilities and the cost of ongoing rehabilitation and long term care are largely undertaken by family members which impoverish their families. [5,6]. India like other developing countries is in the midst of stroke epidemic and will soon face an enormous socio economic burden on the cost of rehabilitation of stroke survivors because the population is now surviving through peak years (age 55-65) of occurrence [7]. Stroke is one of the leading causes of death and disability in India. The estimated adjusted prevalence rate of stroke range 84-262/100,000 in rural and 334-424/100,000 in urban area. The incidence rate is 119-145/100,000 based on the recent population based study [5]. Nearly 2 % of all hospital cases, 4.5% of medical and 20% of neurological admissions in India are due to stroke [8]. WHO estimates suggest that by2050, 80% of stroke cases in the world would occur in low and middle income countries with India and China bearing the major burden [9].

There are very few reports about the incidence and prevalence of stroke from this part of the country. Razdan et al conducted study in 1986 in south Kashmir [10]. However, since 1990 the state has experienced a prolonged political turbulence which exposed the entire population to militancy related stress. This has given rise to numerous non communicable diseases in the state including hypertension and stroke. Despite high prevalence of these disorders, reliable epidemiological data is scarce. Given the limited information on the prevalence and associated risk factors on the stroke, the aim of the present work was to assess the prevalence and identify the correlates of stroke among the rural population of Kashmir

Methodology

For epidemiological study Hazratbal Community Block of District Srinagar with a population of about 150,000 having both urban and rural population of varied socioeconomic conditions was taken up for the studies [11]. The study, a cross sectional survey was undertaken by a team of trained surveyors. In the first phase the households in the study area were selected through cluster sampling followed by simple random sampling. All members of selected households were listed and one adult participant was selected within each household family as key informant. Sampling was facilitated by the census data providing all socioeconomic and other relevant information. Verbal informed consent was obtained from the key informants before asking survey questions. A total of 6960 individuals were selected by random sampling. The screening instrument for the survey was a culturally adapted version of the structured questionnaire developed for these surveys on the

basis of WHO protocol criteria [12] to seek medical and demographic information on the prevalence of stroke and other neurological disorders. The questionnaire was translated in local vernacular and then administered to local respondents. The sensitivity and specificity of the questionnaire was found to be 98 percent and 98 percent respectively.

The screening instrument consisted of three parts; part I, the demographic details , part II the screening questionnaires and part III details about onset, the number of attacks, side affected, associated systemic disease and risk factors, past family or personal history and recording of the investigative findings such as CT scan, if available. In the second phase the screened positive cases were clinically examined. Barthel index was applied to evaluate their disability status. Sociodemographic characteristics included information about age, education, and smoking habit, previous ailments that is the presence of hypertension, diabetes, and previous history of stroke were recorded. And if any of these was present then details about onset of the disease treatment status were noted. Blood pressure levels $\geq$ 140/90mmHg were considered as hypertensive as per Seventh Report of the Joint National Committee VII (Indian Scenario), 2003 on Prevention, Detection, Evaluation and treatment of High Blood Pressure [13]. The index cases and their next of kin were source of information and the old medical reports under their possession, if available, were carefully reviewed. Data were analysed using statistical package SPSS Windows (version16.0, SPSS Inc., Chicago, IL, USA). Chi-square test was used for the comparison between categorical variables.

Results

Demography of study population; A total of 6960 subjects participated in the screening exercise in the first phase out of which 3602 were males and 3358 were females constituting 51.75% and 48.25% of the study population respectively (Table1). The age and gender distribution of the sample population matched with that of Kashmir population (census India 2001). The age distribution of respondents was skewed with majority (30.40%) in the 20-44 age range. The elderly above 75 years of age constituted 3.75% of the study population. The mean age did not differ between males and females. Mean age was 42.62 years; 42.55 for males and 43.17 for females. Those aged less than 45 years were 56.79% of the screened population, while those aged above 45years comprised 43.20 % of the population.

Table 1. Age and sex distribution of study population

Age group	Male		Female		Total population	
	N	%	N	%	N	%
$\leq$ 19	952	13.68	880	12.64	1837	26.40
20-44	1090	15.66	1023	14.70	2116	30.40
45-54	540	7.76	505	7.26	1041	15.00
55-64	500	7.18	491	7.05	988	14.20
65-74	384	5.52	334	4.80	717	10.30
>75	136	1.95	125	1.80	261	3.75
Total	3602	51.75	3358	48.25	6960	-

Chi Square 9.705, p=0.206 (Non Sign

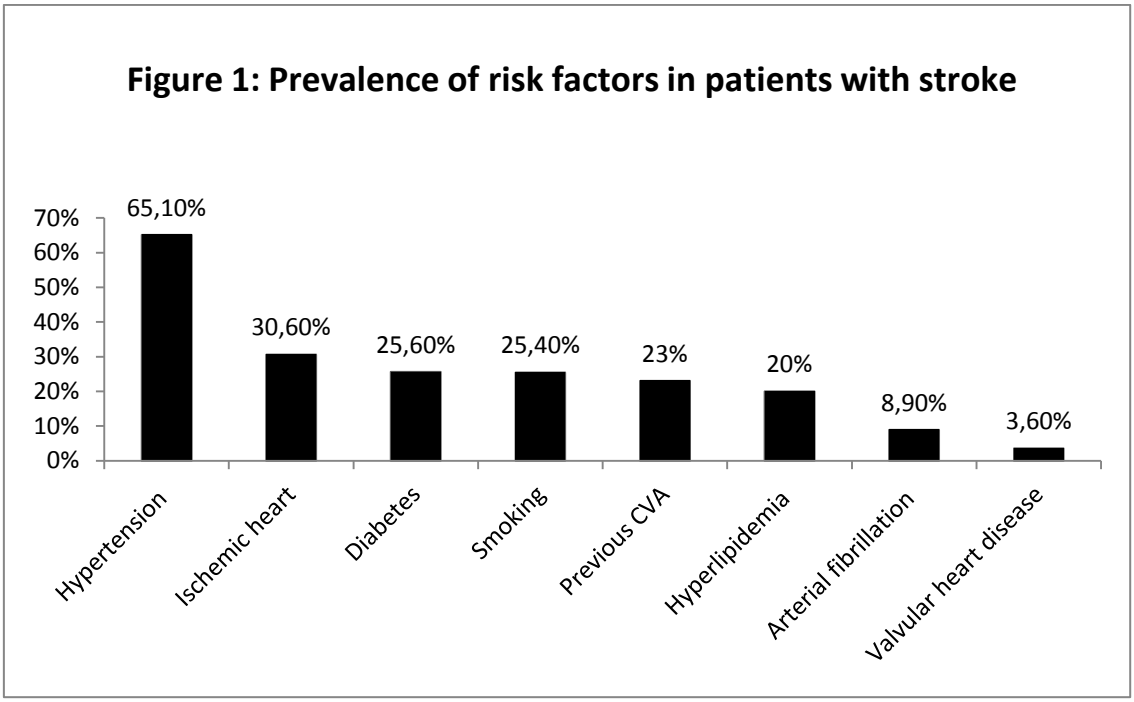
Prevalence rate: Table 2 shows crude prevalence of stroke at the time of survey. Total of 57 persons were found to have had stroke on primary survey yielding an overall crude prevalence rate of 8.19.per 1000. Out of the total 57 subjects 37 were males and 20 were females showing higher crude prevalence of stroke in males than in females. The age specific prevalence rate for both the genders showed progressive increase in prevalence with advancement of age. The prevalence rate of stroke was 2.36 in the age group of 20-44 years which increased to 20.24 in the age range of 55-64.This trend was evident in both the sexes. Among the cases of stroke 20.90 % had full recovery while remaining 79.10% had residual deficits.

Table 2. Age and gender specific prevalence of stroke.

Age group	Male		Female		Total population		Odds ratio	p value
	No of strokes/ population	Stroke prevalence (n/1,000)	No of strokes/ population	Stroke prevalence (n/1,000)	No of strokes/ population	Stroke prevalence (n/1,000)		
≤ 19	0/952	-	0/880	-	0/1837	-	-	-
20-44	5/1090	4.59	0/1023	-	5/2116	2.36	7.10	>0.05
45-54	9/540	16.67	1/505	1.98	10/1041	9.61	5.50	>0.05
55-64	11/500	22.00	9/491	18.33	20/988	20.24	2.84	>0.05
65-74	9/384	23.44	8/334	23.95	17/717	23.71	1.29	>0.05
>75	3/136	22.06	2/125	16.00	5/261	19.16	1.60	>0.05
Total	37/3602	10.27	20/3358	5.96	57/6960	8.19	2.41	

Chi square=4.087; p >0.05 (Non significant)

Risk factors: Hypertension, ischemic heart disease, diabetes mellitus and recurrent stroke were the most common risk factors found associated with the stroke in the present study (Figure1). Hyperlipidemia and smoking were also strongly associated with the prevalence of stroke. Among the various risk factors hypertension was found to be the leading risk factor associated with the stroke incidence with as many as 65.1% of stroke patients suffering from hypertension.



Discussion

Stroke previously thought to be a major public health problem in developed nations is showing an alarming upward trend in developing countries also. WHO projects that burden of disease in case of stroke would predominantly be in developing nations over the next two three decades [14,15]. Because of increase in prevalence of hypertension, changing life styles and demographic shift caused by increasing life expectancy, resulting in increase in elderly population in India, more and more people are at risk of stroke [15,16]. In India, several population based epidemiological studies on stroke have been undertaken in different parts of the country since the eighties [17]. However, not much work has been done on the epidemiology and associated risk factors in Jammu & Kashmir where population has been subjected to

tremendous stress due to prolonged political turbulence since 1990 giving rise to increased prevalence of non communicable diseases. Valid and reliable information on the prevalence and its correlates is crucial in the development of health policies for prevention, early diagnosis and control of this condition.

The current study conducted in Community Development Block Hazratbal Kashmir describes the prevalence and identifies correlates of stroke in the strife torn part of the country. The prevalence rate was found much higher (8.91/1000). The prevalence rates determined from the major epidemiological surveys showed low crude prevalence rates ranging from 44 to 220 per100,000 [10,18,19,20] except Parsis, where it was 842 per 100,000 population [21]. Razdan et al in their study in 1986 found crude prevalence rate of 143/100,000 [10].This study was done more than three decades ago This variation with the present study may also be because of different geographical area besides stress factor due to prolonged militancy. However, Rayaz Jan et al reported a higher incidence of 1.25 % in 2011 which is comparable with the current study [14].

The male preponderance of stroke in our study is comparable with the findings of other workers.[10,14,22]. However, Babak Daneshfard et al have reported that women are more likely to experience stroke than men [2].

The results of the current study show that the prevalence of stroke was rising with advancing age- maximum being the age band of 55-74 years. This shows that as the age increases the risk of suffering from stroke also increases. Siddique Abu N [23] reported that the stroke was most common in 51-60 years age group. The present findings are also similar to many surveys and hospital based studies which have shown that the prevalence rate increases with the advancing age [10, 14, 22].

Among the risk factors associated with the stroke, hypertension was found to be the most leading risk factor for stroke followed by ischemic heart disease. Similar observations have been made by Banerjee TK et al in Kolkatta, in a cross-sectional community based case-control study [24]. Razdan et al in their study in Kashmir in 1986 also recorded hypertension as the most common risk factor among elderly [10]. The association of other factors including diabetes, previous CVA, hyperlipidemia and smoking observed in the current study are similar to the Framingham Heart Study and other international prospective epidemiological studies [25,26].

Conclusion

The prevalence of stroke in the present study is higher than previously reported from Kashmir and other parts of the country. However, rural study site with inhabitants relatively of lower socioeconomic status and sustained militancy related stress may have been a factor for a relatively higher proportion of population at risk of stroke. These are factors that may potentially affect the prevalence of stoke in a community. Given the fact that hypertension is a predominant risk factor for stroke, as reported elsewhere and also demonstrated in the present study, our main emphasis should be on better management of hypertension to decrease the burden of stroke. Management of hypertension, however, is far from satisfactory. Community screening programmes are, therefore, vital to detect subjects having high blood pressure and advocate antihypertensive therapy to prevent stroke. More important, there is an urgent need for undertaking health education measures about the awareness of risk factors and early warning sign of stroke in the community so that people in general and the affected subjects specifically can receive early and effective therapy through modern means.

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References

1. VL Feigin, CM L Lawes, Bennett DA, Anderson CS. Stroke epidemiology ; a review of population based studies of incidence, prevalence and case fatality in the late 20th century. Lancet Neurol, 2003; 2:43-53.

2. Babak Daneshfard, Sadegh Izadi, Abdolhamid Shariat. Mohammad Amin Toudaji, Zahra Beyzavi, Leila Niknam. Epidemiology of stroke in Shiraz, Iran J Neurol 2015; 14(3): 158-163.
3. Asian Acute Stroke Advisory Panel: Stroke epidemiological data on nine Asian countries. J Med Assoc Thai.2000;83:1-7
4. Stroke fact sheet India. http:// www.sant.org/updated %20Stroke%20fact %20sheet%202012pdf.
5. R Bonita, R Beaglehole, Stroke prevention in poor countries. Time for action. Stroke 2007, 38; 2871-2872.
6. JD Pandian, V Srikanth, SJ Read, AG Thrift. Poverty and Stroke in India. A Time to Act. Stroke2007; 38:3063-3069.
7. PM Dalal. Burden of Stroke: Indian perspective. International Journal of Stroke2006;1:164-6
8. PM Dalal. Stroke in India. Japanese circulation J. 1982; 46:621.
9. E Bhourucha Nadir,Kuruvitla Thomas. 1998. Epidemiology of stroke in India. Neurol J South East Asia 1998; 3:5-8.
10. S Razdan, RL Koul, Anil Motta, S Koul. Cerebrovascular Disease in Rural Kashmir, India.1989. Stroke Vol 20, No12:1691-93
11. Economic Survey 2011-12. Government of Jammu& Kashmir, Directorate of Economics & Statistics Jammu & Kashmir.
12. World Health Organization. Research protocol for measuring the prevalence of neurological disorders in developing countries. Neuroscience programme Geneva 1981.
13. AV Chobanian, GL Bakris, HR Black. National heart, Lung and Blood Institute Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure; National High Blood Pressure Education Programme Coordinating Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure: the NC 7 report JAMA,2003;289(19):2560-2572.
14. Rayaz Jan, DS Jamwal, RK Gupta, P Singh. Incidence and Risk factors of Stroke: A Hospital Based Study in Jammu Province of J&K India Public Health Research 2014, 4(3):104-110.
15. JD Pandian, P Sudha. Stroke epidemiology and stroke care service in India.JOS Journal of Stroke 2013 Sept;15(3): 128-134.
16. VI Feigis, CM Lawes, DA Bennett, CS Anderson. Stroke epidemiology a review of population based studies of incidence, prevalence and case fatality in the 20th century. Lancet Neurol 2003; 2:43-53.
17. Gourie Devi M. Can India afford neuroepidemiology (editorial). Neurol India1987; 35:125-27.
18. BC Bansal, Prakash C, Jain AC, KRV Brahmanandan. Cerebrovascular disease in young individuals below the age of 40 years. Neurol India1973; 21:11-8.
19. PM Dalal. Strokes in young and elderly: risk factors and strategies for stroke prevention. J Assoc Physicians India 1997;45:125-31
20. SK Das, K Sanyal. Neuroepidemiology of major neurological disorders in rural Bengal. Neurol India1996; 44:47-58.
21. NE Bharucha, EP Bharucha, AE Bharucha, AV Bhise, BS Shoenberg. Prevalence of stroke in the Parsi community in Bombay. Stroke 1988; 19: 60-2.
22. KO Enwereji, MC Nwosu, A Oqunnivi, PO Nwani, AL Asomugha, EE Enwereji. Epidemiology of stroke in a rural community in Southeastern Nigeria.Vasc Health Risk Manaq 2014 June 24;10:375-88
23. AN Siddiqui, Z Nur, S Mahbub, B Alam, T Miah. Clinical presentation and

epidemiology of stroke – a study of hundred cases. J Medicine 2009; 10:86-89.
24. TK Banerjee, CS Mukherjee, A Sarkhel. Stroke in the urban population of Calcutta-an epidemiological study, Neuroepi-demiology 2001; 20:210-7.
25. S Bhattacharya, SP Saha, A Basu, SK Das. A 5-year prospective study of incidence, morbidity and mortality profile of stroke in a rural community of Eastern India. J Indian med Assoc 2005; 103:655-9.
26. PA Wolf. Epidemiology of stroke. In: Mohr JP Choi DW, Grotta,Weir B,Wolf PA, eds: Stroke Pathophysiology, Diagnosis and Management. Philadelphia: Churchill Livingstone, 2004:13-34