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Prevalence and Etiology of Seizures in Kashmir

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Abstract

Background: *Seizures and epilepsy are common neurological disorders which significantly affect the quality of life. About 10 % of the population experiences a seizure in their lifetime, and are a common source of referrals for neurological consultation. Seizures can vary from the briefest lapses of attention or muscle jerks to severe and prolonged convulsions and vary in frequency, from less than 1 per year to several per day. Owing to scanty information on epidemiology and etiology on seizures in Kashmir, the present study was undertaken to provide update, identify gaps in our present knowledge.*

Methodology: *This was a prospective and observational study undertaken in two phases. In the first phase households in Hazratbal Community Block Srinagar were surveyed for seizure disorder using cluster sampling. Individuals with seizures were clinically evaluated with detailed history and thorough clinical examination as per protocol in the second phase. All patients were subjected to haematological, biochemical and radiological examination. Special investigations like EEG, and CSF analysis were done wherever it was required for patient.*

Results: *The total number of cases included in this study was 47 with male to female ratio of 1:0.88. Majority of the cases were in the age group of 20-39 years followed by 40-59 years. Neuroinfection was the predominant cause of seizures with encephalitis accounting for 12.63%. Other causes included cerebrovascular accidents (25.53%), metabolic (17.02%), miscellaneous (8.51%) and idiopathic (12.76 %).Higher incidence of seizures was observed in the age group of 20-29, followed by 40-49 and 30-39 age groups. Neuroinfection was observed as the leading cause of seizures in the age group of 20- 29 years, followed by age group of 40-49 and 30-39 years. In the age group of 50-59 years metabolic was the common cause of seizures followed by CVA and neuroinfection. Cerebrovascular accidents were found important cause for seizures in all age groups with higher incidence in 40-49 age groups.*

Conclusion: *Prevalence is a measure of the disease burden in the community which has to be considered when planning the health needs. Seizure being a medical emergency, determination of its epidemiology and etiology is a necessary step in its prevention and management. In a sample of 15748 taken randomly out of a population of 150,000, 47 cases of seizure were found. Majority of seizures occurred in the age groups of 20-49 years. Etiological spectrum of seizures was varied and included cerebrovascular accidents, neuroinfection, metabolic, tumour, idiopathic. Neuroinfection and CVA account for significant number of seizures in all age groups.*

Keywords: *Seizures, etiology, epidemiology, neuroinfection, cerebrovascular accidents,*

Introduction

Seizures and epilepsy are common neurological disorders which significantly affect the quality of life. About 10 % of the population experiences a seizure in their lifetime and are a common source of referrals for neurological consultation [1]. A seizure is a sudden surge of electrical activity and seizure episodes are a result of excessive electric discharges in a group of brain cells. Seizures can vary from the briefest lapses of attention or muscle jerks to severe and prolonged convulsions. Seizures can also vary in frequency, from less than 1 per year to several per day [2].

Characteristics of seizures vary and depend on where in the brain the disturbance first starts, and how far it spreads. Temporary symptoms occur, such as loss of awareness or consciousness, and disturbances of movement, sensation (including vision, hearing and taste), mood, or other cognitive functions [2].

Classification of seizures which is being constantly modified is more than an academic exercise, as it determines subsequent decisions on evaluation and treatment, Seizures can broadly be divided into those that are provoked and unprovoked[3]. Provoked seizures also called acute symptomatic seizures, are directly attributed to an acute, active insult to the cerebral nervous system (CNS) or a systemic metabolic derangement (e.g., hypoglycemia). Acute symptomatic seizures represent ~40% of all seizures (excluding fibrile seizures in the pediatric population) and have an incidence of 29-39 per 100,000 person years. [4,5]. Provoked seizures can occur at any stage, but are more common in infants and the elderly [4]. In adults, the leading etiologies are cerebrovascular disease, drug and alcohol withdrawal, traumatic brain injury, and CNS tomour. Provoked seizures are usually isolated, non recurring events. Unprovoked seizures resulting from chronic structural or functional disorders affecting cortical neuronal functions are termed remote symptomatic. The incidence of unprovoked seizures in the general population is 57-63 per 100,000 persons[6,7]. Unprovoked seizures can develop at any stage, but like provoked seizures have the greatest incidence in children and elderly [6,7].

Etiological contribution to seizures in developing countries is different from developed countries. Congenital and genetic causes are common in early childhood. In infancy metabolic and perinatal insults are the leading causes. In older children and young adults inherited predisposition, alcohol, drug abuse and trauma are important causes. Major etiology of seizures in elderly being subdural haematoma, stroke, degenerative disorders. Persons with seizures have lower educational achievement and high rate of unemployment than the general population, even when seizures are well controlled [3]. Employment and school performance may be adversely affected by driving restrictions , stigma, discrimination, fears regarding injury at workplace and adverse effects of AEDs on alertness, cognitive functioning ,and motor coordination.

The seizures tend to be highly treatment responsive but to recur if medications are discontinued over the course of lifetime [3]. Failure of therapy is mainly due to poor compliance. Management of seizures include treatment of underlying etiology, avoidance of precipitating factors, suppression of recurrent seizures by prophylactic therapy and addressing psychological and social issues. It has high remission rates in the early years of treatment. The first two years appear to be crucial as the pattern of chronicity is established with in this period. The availability of CT scan, MRI, and CSF analysis have made accurate diagnosis possible and changed the management of seizures from symptomatic lifelong therapy to etiological short term therapy.

In view of the prolonged turbulence in Jammu & Kashmir exposing the general population to continuous stress and owing to dearth of information on seizures, it is crucial to determine, epidemiology and etiology to facilitate planning and prioritising health needs of healthcare delivery system.

The aim of the present study was, therefore, to identify gaps in our present knowledge about seizures to facilitate planning and prioritising neurology care.

Methodology

Study area

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 [8]. The study, a cross sectional survey was undertaken by a team of trained surveyors. 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 [8]. Verbal informed consent was obtained from the key informants before asking survey questions. A total of 15748 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 to seek medical and demographic information for the diagnosis of seizures and other neurological disorders [9]. The questionnaire was translated in local vernacular and then administered to local residents.. The sensitivity and specificity of the questionnaire was found to be 98 percent and 98 percent respectively.

General Study Design

The study was conducted under two phases. In the first phase sample of households was screened to identify the persons who possibly had a disorder of interest using the pre tested questionnaire. For this phase population surveyed was put in eight age determined sub groups ten years apart. Individuals with seizures and epilepsy were then examined by a senior neurologist in the second phase. The previous EEGs, prescriptions and radiological investigations were taken into consideration, wherever these were available, as supportive evidence. After obtaining ethical clearance, informed consent was taken from the patients and their relatives before initiating further investigations. Out of the 15748 enumerated 47 patients were observed to be suffering from seizures. Each patient was clinically evaluated with detailed history and thorough clinical examination as per protocol. All patients were subjected to haematological, biochemical and radiological examination. Special investigations like EEG, and CSF analysis were done wherever it was required for patient. The data collected was statistically analyzed using relevant software.

Results

Out of 15748 screened in the first phase 795 were found to have some possibility of neurological problem of interest (Table 1). Excluding those who did not respond or gave negative response, the net positive population with some kind of neurological disorder was 743.Out of 15748 47 cases of seizures were identified for further examination.

Table – 1: Response of study population to the questionnaire.

Study Population			Total number	%
Sample taken			15,748	10.50
Screened population	Phase – 1		795	5.04
	Phase - 2	Non responders	35	4.40
		Negative response	17	2.13
		Net positive	743	93.46
		Seizure cases	47	5.91

Age and gender distribution of patients with seizures is shown in table 2. The total number of cases included in this study was 47 with 25 males and 22 females with male to female ratio of 1:0.88. Majority of the cases were in the age group of 20-39 years (n= 22, 46.80%) followed by

40-59 years (n=19, 40.42%). Incidence of seizures was relatively higher in males in both the age groups. The percentage of cases was 6.38 % in the age group below 19 and above 60 years each.

Table 2. Age and gender distribution of seizures

Age (years)	Male (%), n=25	Female (%), n=22	Total (%), n=47
<19	2 (8)	1 (4.54)	3 (6.38)
20-29	7 (28)	6 (27.27)	13 (27.65)
30-39	5 (20)	4 (18.18)	9 (19.14)
40-49	6 (24)	5 (22.72)	11 (23.40)
50-59	4 (16)	4 (18.18)	8 (17.02)
60-69	1 (4)	1 (4.54)	2 (4.25)
>70	-	1 (4.54)	1 (2,12)

Among the etiological causes, as shown in table 3, neuroinfection was the predominant cause of seizures with 17 patients out of 47, constituting 36.17 % of the study population. Among the neuroinfection, encephalitis accounted for 12.76%.Meningitis was responsible for 4.25% of seizures. Other causes included cerebrovascular accidents (25.53%), metabolic (17.02%), miscellaneous (8.51%) and idiopathic (12.76%).While CVT (10.63%) was major causes among CVA, hypoglycaemia, hyponatraemia and hypocalcemia were main metabolic cause of seizures. Tumour was observed as most common etiology under miscellaneous group.

Table. 3 Distribution of etiologies in patients with seizures

Etiologies	Number	%
Neuroinfection	17	36.17
Meningitis	2	4.25
Encephalitis	6	12.76
Meningoencephalitis	5	10.63
Tuberculoma	4	8.51
Cerebrovascular accidents	12	25.53
Infarct	3	6.38
Haemorrhage	3	6.38
Cortical Venous Thrombosis	5	10.63
SAH	1	2.12
Metabolic	8	17.02
Hypoglycemia	3	6.38
Hyperglycemia	1	2.12
Hypocalcemia	2	4.25
Hyponatraemia	2	4.25
Miscellaneous	4	8.51
Tumours	2	4.25
Poisoning	1	2.12
Alcohol withdrawal	1	2.12
Idiopathic	6	12.76

The distribution of etiology in relation with different age groups is shown in Table 4.The results show higher incidence of seizures in the age group of 20-29 followed by 40-49 and 30-39. Neuroinfection was observed as the leading cause of seizures in the age group of 20- 29 years (n=7) followed by age group of 40-49(n=4) and 30-39 years(n=2).In the age group of 50-59 years metabolic was the common cause of seizures followed by CVA and neuroinfection. Cerebrovascular accidents were found important cause for seizures in all age groups with higher incidence in 40-49 age groups.

Table. 4. Various etiologies in relation with age group

Etiology	Age in years							Total
	< 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	> 70	
Neuroinfection	2	7	2	4	2	-	-	17
CVA	1	2	2	3	2	1	1	12
Metabolic	-	-	1	1	3	3	-	8
Miscellaneous	-	1	1	2	-	-	-	4
Idiopathic	-	2	2	1	1	-	-	6
Total	3	12	8	11	8	4	1	47

Discussion

Seizures are common disorders found all over the world affecting the quality of life significantly. They are a common source of referrals for neurology consultations. A careful history and guided evaluation is necessary to avoid misdiagnosis, to establish causation and to determine prognosis. Etiological spectrum depends on age, sex, geography and medical setting [10]. The etiology of seizures in developing countries is different from developed countries. These etiologies even vary from region to region with in India [11].

In the present study out of 47, 6.38% patients were in the age group of below 19 years while a majority of 42.55% were recorded in the age group of 20-39 years followed by 40.42 % in the age group of 40-59.These observations are correlated with the findings of BS Rao etal, and Sridharan and Murthy [11,12].

The incidence and etiological profile of seizures was found to be comparable with other such studies. The present studies showed 36.17 % patients had seizures because of neuroinfection with encephalitis as the major cause followed by meningoencephalitis which is corroborated by Malinikulshrestha et al, Murthy and Yangala, Narayanan and Murthy, B S Rao et al, Annegers et al [4,11,13,14,15]. However, neuro infection occurred in 2% of cases in Sander et al. [17] and 15 % in Annegers et al [4]. Hauser et al reported alcohol related seizures as most common [18]. In the present study 52.94% neuroinfection was recorded in 2nd and3rd decade and 35.29 % in 4th and 5th decade. Amongst neuroinfections, neurocysticercosis was not found in the etiological spectrum of seizures in Kashmir although it has been recorded as the major cause of seizures elsewhere in India. Radhakrishnan etal in his studies on epilepsy also did not observe the presence of neurocysticercosis in Kerala [16]. Cerebrovascular accidents occurred in all age groups with 25 % in 4th decade and 16.70 % in 2nd, 3rd and 5th decade each. Metabolic seizures were predominant in 5th and 6th decade with 37.5 % each followed by 3rd and 4th decade. Etiology spectrum in different age groups was different in our study. Sailaja and Chukka while showing neuroinfection occurring in 3rd and 4th decade recorded CVA in 2nd and 3rd decade [19]. Our results on metabolic seizures in the 5th decade are, however, comparable with the findings of Sailaja and Chukka [19]. Our study also correlates well with Sriharsha and MalaliI in which neuroinfection was the predominant cause of seizures in younger age groups [20].

Conclusion

Prevalence is a measure of the disease burden in the community which has to be considered when planning the health needs at local, regional and national level. Seizure being a medical emergency determination of its epidemiology and etiology is a necessary step in its prevention and management. In a sample of 15748 taken randomly out of a population of 150,000, 47 cases of seizures were found. Majority of seizures occurred in the age groups of 20-49 years. Etiological spectrum of seizures was varied and included CVA, neuroinfection, metabolic, tumor, idiopathic. Neuroinfection and CVA account for significant number of seizures in all age groups.

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