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EARTHQUAKE AND SEIZURES: EXPERIENCE AT FIELD HOSPITAL BAGH KASHMIR PAKISTAN

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ABSTRACT

Introduction: Epilepsy comprises a set of conditions which disrupts the electrical activity in the brain and the main symptoms are recurrent, unprovoked seizures. It is one of the most common long-term neurological disorders, affecting 456,000 people in the UK and around 50 million worldwide. Research which found striking similarities between the electrical activity in the brain before and during seizures and seismological data around earthquakes. **Objective:** To describe the effects of earthquake on epilepsy. **Materials & Methods:** A cross sectional survey was conducted in a one day free medical camp for patients having seizures, at PIMA Field Hospital Bagh Kashmir. All the patients were interviewed and examined by qualified neurologists. Diagnosis of seizure was made on clinical grounds. Demographic, clinical, pharmacologic and neurophysiologic data was recorded and analyzed. Data was analyzed on SPSS version 15.0. **Results:** Thirty two patients were assessed during the clinic. Age 12 years or less were considered children 9 (28.1%) and age more than 12 years as adults 23 (71.9%). Gender distribution was mostly equal. 17 (53.1%) were males and 15 (46.9%) were females. Out of 32 patients, four had seizures after earthquake without head trauma. Seizures were controlled before earthquake in 12(37.5%), controlled before but un-controlled after earthquake in 12 (37.5%) and in 3 (9.4%) un-controlled before and after earthquake. Regarding epilepsy 28 (87.5%) were known epileptic before and 4 (12.5%) had seizures or epilepsy after the earthquake. Compliance to medications was present in 28 (87.5%) and noncompliance in 4 (12.5%). **Conclusion:** Our limited data suggests that earthquakes worsen seizure control and may induce new seizures even without significant head trauma.

INTRODUCTION

Epilepsy and earthquake are usually preceded by small, barely detectable tremors and as with an earthquake. The longer it has been since a seizure, the longer it will be until the next one. According to scientists, these shared features mean that the patterns are not random and could even be governed by similar mathematical rules. Epilepsy is a common neurologic disorder, manifested by seizures. It affects approximately 1% of world population and is probably more common in developing world. Underlying etiology may be inherited traits, brain infections, brain tumors and metabolic derangements. There are some reports of earthquakes triggering seizures. Recently

Northern areas of Pakistan were struck by one of the worst earthquakes of Pakistani history.

Epilepsy is a disorder of the brain that is characterized by a predisposition to seizures and by its neurological cognitive, psychological and social consequences¹. WHO estimates that eight people per 100,000 have this disease². The prevalence of epilepsy in developing countries is usually higher than in developed countries³⁻⁵. However, it is an under recognized condition in Asia.

Both earthquake and epileptic seizure involve interactive threshold elements. A large event i.e., a seismic

shock or repeated nonlinear interactions among their subunits namely, opening crackles (that emit electromagnetic emission) or firing neurons. Scientific studies of disaster behavior have confirmed the fact that a natural disaster has profound psychological effect for its victims⁶. The extent of destruction; the number of people killed as a result of the catastrophe may affect the intensity and the slope of psychological impact.

MATERIALS & METHODS

A cross sectional survey conducted during a one day free medical camp for patients having seizures, at PIMA Field Hospital Bagh Kashmir, one of the areas affected by the earthquake. Patients and their relatives were informed 15 days before; so that they should reach from different areas of Bagh city and villages. All the patients were interviewed and examined by qualified neurologists. Diagnosis of seizure was made on clinical grounds. Regarding the onset of first episode of seizure either before or after the earthquake, inquiry about the anti-epileptic medications and compliance, control of seizures, head trauma and investigations like MRI/CT Scan brain, EEG was done. Data was collected through perform in local language and then translated into English to enter in SPSS for analysis. Demographic, clinical, pharmacologic and neurophysiologic data was recorded and analyzed on SPSS version 15 and results were obtained in frequencies and percentages.

RESULTS

Total of 32 patients were diagnosed with epilepsy and

randomly distributed among five qualified neurologists. Diagnosis of epilepsy was made on clinical grounds. Age 12 years or less were considered children 9(28.1%) and age more than 12 years as adults 23(71.9%). Gender distribution was mostly equal, 17(53.1%) were males and 15(46.9%) were females. Out of 32 patients, four having seizures after earthquake without head trauma. One patient brought EEG tracings, due to its quality and electrodes arrangement, no comment can be made. Another patient having CT scan brain film, showed subdural hematoma and contusion hemorrhages. For control of seizures, the variables were- seizures controlled before earthquake, seizures uncontrolled before earthquake, controlled before but uncontrolled after earthquake and uncontrolled before as well as after earthquake. Four patients having post-earthquake seizures did not qualifying for these variables and were included in the missing information on interpretation of data. For results regarding control of seizures, refer to Table 1.

DISCUSSION

It is well established that post-disaster or post-trauma there is immense psychological effect, so we did not check the former psychological status of these patients. This is a drawback of this study. It is found that the number of the psychiatric admissions to the hospital increased by 27% after the disaster⁷. A significant proportion of parents of children with epilepsy experience posttraumatic stress disorder (PTSD) or posttraumatic symptoms (PTSS).

Cases of cerebral organic syndromes increased from

TABLE 1. Control of seizures

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Controlled before the earthquake	12	37.5	42.9	42.9
Uncontrolled before the earthquake	1	3.1	3.6	46.4
Controlled before but uncontrolled after the earthquake	12	37.5	42.9	89.3
Uncontrolled before and after the earthquake	3	9.4	10.7	100.0
Subtotal	28	87.5	100.0	
Missing data	4	12.5		
Total	32	100.0		

TABLE 2. Seizures either known before earthquake or new onset seizures after disaster

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Known epileptic before earthquake	28	87.5	87.5	87.5
Epilepsy or seizures after earthquake	4	12.5	12.5	100.0
Total	32	100.0	100.0	

TABLE 3. Compliance to medications

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Compliance	28	87.5	87.5	87.5
Noncompliance	4	12.5	12.5	100.0
Total	32	100.0	100.0	

226-324 or 43%. The diagnostic sub-category which accounted for much of the increase was epilepsy. Although it is not possible to say disasters (earthquakes) are one of the etiological factors for epilepsy, it is thought that this may be a consequence from head blows sustained during earthquake. Others feel that after the disaster the subsequent living arrangements create pressures, so that families seek help for the epileptic member⁸.

We found profound effect of earthquakes in precipitating the seizures. Regarding patients, who have seizures after disaster, either prevalence that can be seen in any population (non-disaster) or the vague possibility of epilepsy as secondary to earthquakes as an etiological factor, needs more studies to be established as fact. The sample size of this study is also very small.

Very scant literature is available on effects of earthquakes on seizures. This may be an initiative to search more regarding association of earthquakes and seizures.

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