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Epilepsy – Clinico-etiological Profile at Tertiary Care Centre

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ABSTRACT

Aims and Objectives: To evaluate clinical, etiological and electroencephalogram profile in seizure patients. **Materials and Methods**: The cases having episodes of seizure were studied. This was descriptive, analytical, observational type of study, done at tertiary care hospital. Duration of study period was 3 years. Detailed clinical baseline information regarding age, onset age of seizure, type, duration, associated autonomic changes etc. were studied. Relevant birth, family and past history, medication etc. were noted. Routine investigations, radiological findings and electroencephalogram changes were noted. Additional investigations were done wherever required. **Results:** Total 200 cases were studied over a three year period. The age range for seizures was from 2 month to 75 years, with maximum number of cases were in first and second decade. The male: female ratio was 2.7:1. The main etiological factor was idiopathic in 114 cases(76.51%) followed by neurodegenerative disorders (7.38%) ,developmental disorders (5.3%), head trauma (2.6%), organic lesions (2.0%) and other with infections, cerebro-vascular diseases, alcoholism, psychological, metabolic etc. **Conclusion: Among** 200 cases of seizures, the epileptiform activity was observed in 149 patients. During the study period, a total of 200 cases were studied. The epileptiform activity was observed in 149 patients. The age range for seizures was from 2 months to 75 year. The male: female ratio was 2.7:1. The common type of seizures observed were of focal(54.35%) in which complex partial 60 cases and simple partial 21 cases, while generalized seizures were in 61 cases (45.65%) in which tonic-clonic type were common. The common etiological factor in our study who showed epileptiform activity on EEG was idiopathic 76.51%. In this rural area there is substantial burden of epilepsy ,it requires health care resources, proper counseling, diagnostic modalities and patient care.

Keywords: Electroencephalography, Seizures, Causes of Epilepsy, Neurological disorders.

Introduction

A paroxysmal event due to abnormal excessive or synchronous neuronal activity in the brain gives a seizure. When there are recurrent seizures due to a chronic underlying process it is dignosed as epilepsy. Epilepsy is a common medical and social disorder or a group of disorders which is remarkably uniformly distributed around the world with no racial, geographical, or social boundaries. Epilepsy is one of the most prevalent non-communicable neurologic condition and is responsive for disability and mortality [1,2]. Epilepsy is derived from Latin and Greek word for seizure or to "seize upon". A wide range of various types of seizure and epilepsy syndromes have been identified. It is essential to take careful clinical history since diagnosis of epilepsy is often based on clinical ground.Today epilepsies are studied by electromagnetic discharges in the brain in prediagnosed persons. Various other diagnostic tools such as computed tomography (CT) and magnetic resonance imaging (MRI) are also be used.

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Materials and Methods

This was analytical, observational, descriptive study done in Department of Physiology at tertiary care hospital in rural area of Maharashtra. The objectives were to study the clinical spectrum of seizures, to find out its etiological factors and to evaluate the usefulness of neuroimmaging in epilepsy .Selection of patient - all cases presented with new onset of seizure. Exclusion criteria-neonatal cases, known patient on treatment. Preliminary data protocol was prepared which includes name, age, sex, history of first episode of seizure, type of seizure, frequency etc. Detailed medical history, family history, past history was noted. Comprehensive history of birth and developmental disorders, head injuries, CNS infections, neurodeficit, history of febrile seizures,etc. were noted. All relevant biochemical, haematological, radiological etc. investigations were noted.Data is analyzed and results were obtained .Total of 200 patients sequentially referred for electroencephalogram (EEG) from our institute were included in present study and their EEG was recorded. EEG recording is a dynamic procedure. It was recorded on a 16-channel Brainwave plus EEG machine. Electrodes WERE placed according to 10-20 system. Each electrode consists of disc or cup connected to an insulated wire. EEG machine is a powerful and complex biological amplifier, which highly amplifies those potentials and produces deflections of ink writing pens.

Preparation of the patient-Routine examination of patient was done. Before doing EEG the scalp hair were well shampooed and washed with water to remove oil. Electrodes were applied to the scalp with the help of electrode paste. Standard EEG was run with low filter on 1 Hertz or 0.5 Hertz and high filter on 70 Hertz with speed 30mm/s. We used RMS EEG-24 Brain view plus machine recorder and medicare system by Chandigarh. EEG was recorded in adults in montages A, B and C. Activation procedures like hyperventilation and photic stimulation were used. The recording was taken in each montage for 3 minutes and patient is asked to perform hyperventilation for 3 minutes, post hyperventilation record were taken for 2 minutes in montage A, photic stimulation were done for 3 minutes with eyes open and eyes closed in montage B.

Table 1: Age related onset of seizures

Age (in years)	No. of cases
0-10	84
11-20	43
21-30	32
31-40	17
41-50	13
51-60	04
61-70	06
71-80	01
Total	200

Table 2: Various types of seizures in our study

No.	Types of seizures	Forms of seizures	No. of cases	Percentage
1.	Focal	Simple partial	21	54.35
		Complex partial	60	
2.		Tonic-clonic(grand-mal)	32	
	Generalised	Tonic	12	45.65
		Clonic	10	
		Myoclonic	04	
		Atonic	07	
		Absence /petit-mal	01	
		Others	02	
			N=149	100

Table 3: Epilepsy- Causal factor leading to epileptogenesis

No.	Etiological Factors	No. of Cases.	Percentage
1	Idiopathic	114	76.51
2	Neurodegenerative disorders	11	7.38
3	Developmental disorders	08	5.38
4	Head injury	04	2.60
5	Organic lesions	03	2.01
6	Cerebro- vascular diseases	02	1.34
7	Infective	02	1.34
8	Alcoholism	02	1.34
9	Subacute Sclerosing Panencephalitis	01	0.67
10	Psychological	01	0.67
11	Metabolic	01	0.67
	Total	149	100%

Discussion

The prevalence of epilepsy has been estimated worldwide at 5-10 persons per 1000. In US adults approximately 2.3 millions people are affected by epilepsy[3,4]. In India it is 5.59 per 1000[5].In present study the age range is from2 months to 75 years with common age group was in between 2 months to 10 years of total 84 cases and second was in age group of 11 to 20 years(Table 1). Epilepsy occurs at all ages especially in childhood, adolescence and increasingly in aging population [6]. In present study M:F ratio was 2.7:1. The study by Pradeep PV. et al. showed M:F ratio was 3:1 [7]. While Muralidhar V. et al showed M: F ratio as 2.1:1 with maximum cases (50%) in age group of 16 – 25 years [8].

Various types of seizures are classified as

a) Focal Seizures – Simple partial and complex partial

b) Generalised Seizures –Tonic -clonic,Myoclonic, Tonic, Clonic, atonic, absence (Petit Mal)

c) Not classified. (may be focal, general,or unclear).

Focal seizures originate in networks limited to one cerebral hemisphere and generalised seizures involves both hemispheres.

Our study showed mostly focal seizures constituting 54.35%, while generalized seizures were in 45.65% cases. The other subtypes of each were shown as in table 2. Study by Lopez et al showed focal seizures in 41.6 and generalised in 58.4 % cases[9].

Acharya H et al showed focal 41.33% and generalized type in 58.67% cases[10].

The common etiological factor in our study (total149 cases) who showed epileptiform activity on EEG was idiopathic, which constituted 76.51%, neurodegenerative diseases and dementia 7.38% followed by developmental 5.38% , head injury 2.60%, organic lesions 2.01%, CNS infections 1.34% , cerebro-vascular diseases 1.34%, etc. The study done by Hauser WA[11], Ragatti M et al[12]Pradeep PV et al. (7) showed 68.7%, 44%, 35% cases were of idiopathic epilepsies respectively. Epilepsy beginning in adult life is likely to be due to progressive brain disease as compared to idiopathic epilepsy which has its onset in childhood or younger age [7,9,13]. The neurodegenerative diseases and dementia in our study showed 7.3% cause for epilepsy. It is observed that neurodegenerative disease like Alzeheimers and other dementias increases risk of seizures by 6 to 10 times[14]. Epilepsy to some other casual factors noted in our study were developmental (5.38%), head injuries (2.60%) cases. Hauser et al [11] noted causes for similar were 5.5% and 4.1%. Specific causes are correlated with age groups. It is observed that different age groups tend to have different causes of epilepsy[15]. New onset epilepsy in older patients is mainly related to the brain injuries and other secondary causes [16]. Younger patients with epilepsy often show a genetic cause. Epilepsies are divided into three categories – genetic, structural, metabolic, unknown causes by International League Against Epilepsy (ILAE) in 2010 [17]. The common causes for elder patients are cerebro-vascular disease, primary neuron degenerative disorders, CNS tumors and trauma to head [18]. Trauma to head is a common cause of intractable epilepsy which causes 10-20 % of symptomatic epilepsy in general population of 5% of all epilepsy[19]. Children, younger and older people are at risk of post traumatic epilepsy. In our studies 2.6 % cases were related to head injuries. In our study 2 cases were related to alcoholism,2 cases diagnosed as infective related to tuberculoma. Out of 200 cases 149 showed EEG changes. While in 51 cases there was no epileptiform activity, most of these cases were related to febrile convulsions and were seen in early

childhood where common etiology was infective. The diagnosis of epilepsy is done on patient's medical history, type of seizures and electroencephalogram (EEG). Imaging tests such as computed tomography (CT) and magnetic resonance imaging (MRI) may also be used. In our study epileptiform activity was noted in more than 45% cases. Study by Hirtz et. al observed abnormal EEG in 42% cases[20]. EEG along with neuroimaging like CT , MRI were helpful for detection of specific secondary causes. Also routine blood studies were indicated to diagnose metabolic infectious etc causes. The conditions like syncope, pseudoseizures should be carefully evaluated. It is essential that specialist is required in early diagnosis of epilepsy and to take appropriate care of individuals. Diagnosing epilepsy can be complex. The goal of epilepsy treatment is to control seizures. Many different types of anticonvulsant drugs are available to treat epilepsy. Some patients need only one drug, while others may need to take several drugs. For patients who have not been helped by medication, surgery may be an option. Diagnosis of epilepsy is important for prognosis and treatment. One in three people with single unprovoked seizure will have second seizure over the next five year [6]. So treatment should be started after proper diagnosis with appropriate antiepileptic drug, surgery or as per etiological factor [21]. Individuals with epilepsy are at increased risk for early mortality, difficult in management and have increase cost for health, higher rate of psychiatric comorbidity like depression, anxiety,and social stigma [22,23].

Conclusion

In this geographical area there is substantial burden of epilepsy with large rural population and limited health care resources which requires proper counseling, diagnostic modalities and treatment.

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