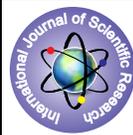


Interpretations of EEG in Children with Convulsions



Medical Science

KEYWORDS : EEG, Convulsions

Dr. Bhushan Damodhar Dudhane

Assistant Professor, Dept. of physiology, Indira Gandhi Govt. Medical college, Nagpur. (M.S.)

Dr. Mrs. Mrunal Phatak

Professor, and Head, Dept. of physiology, Indira Gandhi Govt. Medical college, Nagpur. (M.S.)

ABSTRACT

Introduction - Seizure disorders are relatively more common in infancy and childhood. We decided to study the EEG in children with convulsions who were referred to the department of physiology IGGMC, Nagpur for investigations.

Aims and objectives - To analyze EEG findings in clinically diagnosed cases of seizure disorders in children and study age wise & gender wise prevalence in them.

Materials and methods - 46 patients of age up to 12 years who were having the abnormal EEG pattern were selected for the study whose EEG were recorded by "RMS-EEG Superspec 32 channels machine."

Observations and results - 44 out of 46 subjects were having generalized tonic clonic seizures and out of 44 cases; 10 were suffering from febrile seizures.

Conclusion - There is increased prevalence of generalized tonic clonic seizures, (predominantly febrile seizures); in children above one year of age with no gender difference.

INTRODUCTION -

The first recording of the EEG in man was made by Hans Berger in 1924. Since that time EEG remains a valuable tool for assessing the disorders of cerebral function particularly epilepsy (1)

Physiological basis :-

Two types of electrical activities occur in the nervous system -

- Evoked potentials -
- spontaneous electrical activity - " EEG"

In EEG, there are four different waves - α , β , δ , and θ . These are due to flow of current in the "dipole" formed by dendrites with the cell bodies of neurons. (2)

EEG involves recording of summated electrical activity of brain neurons (i.e. IPSPs + EPSPs). Utilities of EEG - EEG studies the functions of cortex in health and disease. It helps in defining the seizure type and in assessing its prognosis; in selection of the appropriate anticonvulsants for therapy (3); to localize epileptic focus and distinguish the simple febrile convulsions from epilepsy. (6) Limitations of EEG - As EEG can record electrical activity only from large group of neurons, it is not possible to localize minute cortical lesions. It is also less useful for assessing the seizure control. (3) Seizures in children - Overall incidence of seizures amongst children is around 15% in inpatients and 11% in OPDs. (4) Incidence of febrile convulsions in 3 mths to 5 yrs of age is 3-4%. (5) Boys are affected nearly twice as frequently as girls. (4) In this study, we selected the children with convulsions, referred to our department for analyzing the prevalence of types of seizure disorders in them on the basis of EEG reports.

AIMS AND OBJECTIVES -

- To study EEG findings in clinically diagnosed cases of seizure disorders in children.
- To study age wise and gender wise prevalence of seizure disorders in them.

MATERIALS AND METHODS -

During last one year, we had record of 50 pediatric patients up to 12 year of age; with H/O convulsions who were referred for EEG investigations to the dept of physiology, IGGMC, Nagpur.

Selection criteria :-

subjects with abnormal EEG findings (n=46) were selected for our study and their EEG were analyzed. EEG of all the patients were recorded with a computerized electronic machine, named "RMS - EEG Superspec 32 Channels with 10 -20 International system."

21 Active (bipolar) electrodes along with one reference and one

Ground electrode were applied over the scalp of patients with the help of suitable jelly; as shown in the figure Proper sedation was given to the children whenever necessary. Continuous recording of EEG was obtained for about 20 minutes.

Observations and Results -

After the interpretations of EEG and its correlation with patient's history;

following observations were noted :-

- EEG recordings in majority of subjects (i.e. 44 out of 46) were indicative of generalized tonic clonic seizures.

There were generalized bursts of spikes and irregular 4-6 Hz spike wave complexes.

Only two patients showed petit mal (absence) type of seizures; showing characteristic 3/second spike and slow wave pattern in EEG.

- We found equal distribution of seizure disorders in both male and female subjects.
- Almost 10 subjects out of 46 were found to be having febrile convulsions.
- Total 39 out of 46 subjects were above the age of one year.

DISCUSSION -

Convulsions - abnormal electrical discharges from the brain resulting in involuntary, paroxysmal, motor, sensory, autonomic or sensorial changes. When these occur recurrently; it is termed as "epilepsy." (6)

Our study observed generalized tonic clonic seizures and febrile seizures as most common type of disorders in children with convulsions.

According to epilepsy foundation, tonic-clonic seizures occur most commonly in children younger than 10 years old. These are associated with widespread cortical activities and involve both cerebral hemispheres simultaneously.

We noticed 10 cases out of 46 (almost 20%) as having febrile seizures. Febrile seizures is the commonest cause of seizures during early childhood (3 months - 5 years), which are associated with fever but without evidence of intracranial infection or defined cause. (8)

Simple febrile seizures are generalized tonic- clonic, last for less than 10 minutes and do not usually show EEG abnormality ,have excellent prognosis.

Whereas complex (atypical) febrile seizures last for more than 10 minutes ; show abnormal EEG changes & have future chances of developing epilepsy.(6)

Our study observed only 2 cases (aged 3 yr &12 yr) of petit mal seizures.

Absence seizures start in childhood between age 4 – 5 yrs ;last for less than 30 seconds ; don't have neurological manifestations ,and neurological development is normal . These are much less common than tonic clonic seizures in children .(6)

SUMMARY AND CONCLUSION -

There is increased prevalence of generalized tonic clonic seizures ;(predominantly febrile seizures) in children above 1 year of age having no gender difference.

REFERENCE

- 1) C B Tan ; The EEG and Epilepsy ; SING MED J. 1989,NO 30, 424 -425 | (2) Chakrabarti ,Ghosh and Sahana ; "Human Physiology" 2nd edition | (3) Browne TR ,Dreifuss FE; Clinical and EEG estimates of absence seizures frequency . Arch Neurol 1983; 40:469-472 . | (4) Suraj Gupte ; Short Textbook Of Paediatrics , 7th edition | (5) Aicardi J. ; Febrile convulsions .In:Epilepsy in children , International reviews of child neurology series New York, Raven Press 1994 ,(253-275) | (6) O.P.Ghai – Essential Paediatrics; 4th edition . | (7) Bea J. Vanden Berg ,studies on convulsive disorders in young children. | Pediat. Res 3; 298-304 (1969) | (8) Consensus Statement .Febrile seizures : long term management of | children with fever associated seizures .Paediatrics 1980;66:1009-1012. | |