Original Research Article

# Clinical and Laboratory Profile of Children Presenting With Seizure in A Tertiary Care Hospital: An Observational Cross Section Study

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**Abstract**

**Background:** Seizure is one of the common causes of childhood hospitalization with significant mortality and morbidity. Current study is to find type, clinical, demographic, biochemical profile and neuroimaging of children presenting with seizure to tertiary center in Department of pediatrics Government Medical College and Hospital, Aurangabad. **Subjects & Methods:** This was a hospital based, prospective cross-sectional study conducted in Department of pediatrics Government Medical College and Hospital Aurangabad. Total 260 children between the age of 1 months to 12 years attending epilepsy clinic during the study period, were studied for clinical features, types, biochemical profile, imaging studies, EEG, etc. **Results:** Higher prevalence in the age group of 1 month to 1 year with male predominance (male/female = 1.6: 1) was found. In the present study Loss of consciousness (35.76 %), fever (25.76 %), vomiting (23.84 %), and headache (10.38 %) were four leading clinical complaints observed in children presenting with seizures . Generalized tonic-clonic seizures were the most common seizure semiology among the study cases. **Conclusion: A**ppropriate study on clinical, demographic, biochemical profile and neuroimaging study of patients can help in proper understanding of the disease burden and to take appropriate measures for its control.

**Keywords:** Electroencephalogram (EEG), Computed tomography (CT), Magnetic resonance Imaging (MRI), generalized tonic clonic Seizure (GTCS)



## Introduction

Seizure is a period of paroxysmal, time limited change in motor activity and behavior due to abnormal excessive or synchronous neuronal activity in the brain. It involves transient, involuntary alteration in consciousness, motor activity and autonomic function which is caused by an excessive rate of discharges from a group of cerebral neurons. It is a common problem in pediatric group often evaluated in emergency clinics. Epilepsy is a condition of susceptibility and long term risk to further seizures. Continuous seizure activity lasting more than 30minutes without period of recovery of consciousness is Status epilepticus[1].The resulting manifestations of seizure depends upon the threshold of brain, age and neurodevelopmental maturity status in children[2]. It requires thoroughinvestigation and diagnostic testing to know underlying central nervous system disorder[3]. Patients must be provided aggressive management in

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the form of pharmacological interventions stabilization and resuscitation.[5] Early diagnosis, classification and management is very necessary which is a problemin resource-limited areas. There is a paucity of enough investigations and technologiesin many tertiary care hospitals. There is literature available for explaining profile of seizure in childrenbut only limited studiesbased on clinical and laboratory profile present to access. Hence this observational crosssectionalstudy was therefore conducted tostudy the clinical and laboratory profile in childrenpresenting with seizures[4,5].

## Materials and Methods

This was a prospective cross-sectional study conducted atepilepsy clinic' of Pediatric department of Government Medical College and Hospital Aurangabad. Approval of institutional ethics committee was taken prior to commencement of this study. Written informed consent was obtained from all participants or from guardian. 260 children's with Seizure cases between the ages of 1 months to 12 years attending the epilepsy clinic were enrolled over a period of 2 years from April 2018 to January 2020.Detailed history of the patient was taken with chief complaints, history of present illness, past history, family history of seizure, consanguinity, birth history, developmental history,immunization status as well as details of the seizure history, type of seizure, duration, frequency, semiology and treatment history. Detail examination both general and systemicwith neurological examination was conducted thoroughly. Laboratory investigations like complete blood count, CSF study, urine examination, serum C-reactive protein, serum electrolytes, blood glucose estimation was done as per protocol for seizure. Other investigations like EEG, CT scan and MRI was done according to etiology and findings. Data collected compiled in MS EXCEL Sheet 2018. Analysis of Data is done by SPSS Software Version 2.0. Qualitative data tabulated in the frequency and percentage form. Quantitative data tabulated in the form of Mean, Median, Mode and Standard deviation. Chi-square test has been used to test the proportions for categorical samples, whereas Student's *t*-test was used for non-categorical samples. p Value of less than 0.05 was considered statistically significant. Both Qualitative and Quantitative data represented in the form of visual impression like Bar Diagram, Pie Diagram. Microsoft word and Excel have been used to generate graphs,tables etc.

## Results

In the present study children's having seizures are subdivided into 4 age groups. Majority of the cases (108) were from the age group 1 month to 1 year age, consisting of 71 male and 37 females. Followed by 70 cases belonging from the age group 1.1 (1 year 1 month) to 4 years, 47 cases from 4.1 (4 year 1 month) to 8 years age group and 35 cases from 8.1 (8 year 1 month) to 12 years age group [Table 1].Loss of consciousness (35.76 %), fever (25.76 %), vomiting (23.84 %), and headache (10.38 %) are four leading clinical complaints observed in seizure patients, whereas speech disorder (1.53 %) was the least common complaint [Table 2]. Out of total study population (260), 157 (60.38%) cases werepresented with GTCS, 74 (28.46%) with CPS, 15 (5.76%) with mixed seizures, 7 (2.69%) with myoclonic seizures and 6 (2.31%) with partial seizure [Table 3]. The mean values of different biochemical parameters are depicted in Table 4. Electroencephalogram (EEG), CT scan and Magneticresonance imaging (MRI) was performed in all the cases. It was found that 214 cases (82.31%) had abnormal EEG, while 46 (17.69%) cases had normal EEG. 187 (71.93%) had normal CT scan, while 73 cases (28.07%) had abnormal CT scan. 159 cases (61.16%) had normal MRI and 101 cases (38.84%) had abnormal MRI [Table 5].

**Table 1: Age wise distribution of cases**

| Age | Male | Female | Total |
|---|---|---|---|
| **1 Month to 1 years** | 71 (45.82%) | 37 (35.23%) | **108 (41.53 %)** |
| **1.1 (1 year 1 month) to 4 years** | 41 (24.45%) | 29 (27.61%) | **70 (26.92 %)** |
| **4.1 (4 year 1 month) to 8 years** | 24 (15.48%) | 23 (21.90%) | **47 (18.07 %)** |
| **8.1 (8 year 1 month) to 12 years** | 19 (12.25%) | 16 (15.26%) | **35 (13.46 %)** |
| **Total** | **155 (59.91 %)** | **105 (40.38 %)** | **260 (100 %)** |

**Table 2: Symptoms wise distribution of cases**

| Symptoms | No. of cases (n) | Percentage (%) |
|---|---|---|
| Fever | 67 | 25.76 % |
| Vomiting | 62 | 23.84 % |
| Headache | 27 | 10.38 % |
| Meningeal Irritation | 7 | 2.69 % |
| Unconsciousness | 93 | 35.76 % |
| Speech Disorder | 4 | 1.53 % |
| Total | **260** | **100 %** |

**Table 3:Type of seizure wise distribution of cases**

| Type of seizure | No. of cases(n) | Percentage (%) |
|---|---|---|
| Generalized tonic clonic seizure (GTCS) | 157 | 60.38% |
| Complex partial seizure (CPS) | 74 | 28.46% |
| Mixed Seizure | 15 | 5.76% |
| Myoclonic Seizure | 07 | 2.69% |
| Simple Partial Seizure | 06 | 2.31% |
| Total | **260** | **100 %** |

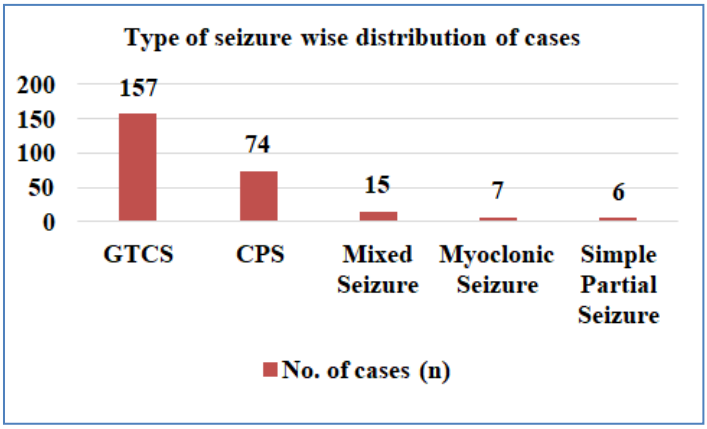


**Table 4: Biochemical Profile wise distribution of cases**

| Biochemical Profile | Mean ± SD |
|---|---|
| Hemoglobin (gm/dl) | 11.5 ± 1.57 |
| Total leucocyte count (x $10^3$/$mm^3$) | 12.5 ± 6.5 |
| Platelet count (lac/$mm^3$) | 3.25 ± 2.30 |
| Serum Total bilirubin (mg/dl) | 2.32 ± 5.80 |
| SGOT (IU/dl) | 25.56 ± 6.42 |
| SGPT (IU/dl) | 23.93 ± 5.91 |
| Serum creatinine (mg/dl) | 26.18 ± 14.72 |
| Blood Urea Nitrogen (mg/dl) | 4.36 ± 16.64 |

**Table 5: Neuroimaging study wise distribution of cases**

| Results | Electro Encephalogram | Computed Tomography | Magnetic Resonance Imaging |
|---|---|---|---|
| Normal | 46 (17.69%) | 187 (71.93 %) | 159 (61.16) |
| Abnormal | 214 (82.31%) | 73 (28.07 %) | 101 (38.84 %) |
| Total | **260 (100 %)** | **260 (100 %)** | **260 (100 %)** |

## Discussion

This was a hospital based prospective study of children admitted with acute episode of seizure in a tertiary care center in the Department of Pediatrics, Government Medical College and Hospital Aurangabad, Maharashtra India. It was aimed in studying demographics, clinical features, seizure types, biochemical profile and neuroimaging studies during the hospital stay of children. Children's in their first year of life accounted for the highestincidence of seizure with higher prevalence in the age group of 1 month to 1 year with male predominance (male/female = 1.6: 1). In the similar study by S. Saravanan et al (2013) 6, S. Basu et al (2007) and K. N. Shakya et al (2003) same findings were observed. In the present study Loss of consciousness (35.76 %), fever (25.76 %), vomiting (23.84 %), and headache (10.38 %) are four leading clinical complaints observed in seizure patients[7,8]. In the similar study by A. R. Ojhaet al (2015) and S. Adhikariet al (2013) same findings were observed[9,10]. In the present study the generalized tonic-clonic seizures were the most common seizure type among the study cases. In the similar study by S. Adhikari et al (2013) and R. Idro et al (2008) same findings were observed with majority of children with seizures had generalized tonic-clonic typefollowed by partial seizures[10,11].

### Limitations of the Study

There are few limitations to these study like metacentric and community based studies are needed to generalize the results in general population. The other limitation is that the parents may not have been able to give an accurate past history and birth history.

### Conclusion

Children's with seizures put a significant burden on OPD and inpatient department of developing countries with GTCS being more common. Proper study on clinical, demographic, biochemical profile and neuroimaging study of patients can help in proper understanding of the disease burden and to take appropriate measures for its control.

**Conflict of Interest: Nil**
**Source of support:Nil**

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