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# ORIGINAL ARTICLE

## PATTERN OF CHILDHOOD EPILEPSY IN A TERTIARY CARE HOSPITAL

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**HOWTOCITETHISARTICLE:**
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**ABSTRACT: OBJECTIVE:** To study the various patterns of epilepsy in children from 1 month to 18 years. **METHODS:** Observational study. **RESULTS:** 55 % had generalized epilepsy, 37 % had partial epilepsy and unclassified8 %. 70 % 0f generalized epilepsy had onset < 5 years, 58% of partial epilepsy> 5 years and 87.5 % of unclassified group < 2 yrs. Family history12 %and Developmental delay was present in 28 % of the cases.64.8 %generalized, 50 % partial and 100 %unclassified epilepsies had EEG abnormalities. 29.16 % generalized, 50 % partial and 66.66 % in unclassified epilepsies had abnormal Neuroimaging. **CONCLUSIONS:** It is important to classify all epilepsies depending on various clinical patterns in children and investigate them in order to initiate early therapy to prevent recurrences.

**KEYWORDS:** Epilepsy, onset, pattern, neuroimaging.

**INTRODUCTION:** Epilepsy is one of the commonest problems encountered in pediatric practice. Epilepsy includes a group of heterogeneous and diverse conditions. The WHO Neuroscience Research Protocol for studying the prevalence of neurological disorders in developing countries, which was developed in collaboration with the Neuroepidemiology branch of the US National Institute for Neurological Disorders and Stroke (NINDS), defines epilepsy as two or more afebrile seizures unrelated to acute metabolic disorders or to withdrawal of drugs or alcohol. Patient who have had a seizure within the last 2 – 5 years and those on anticonvulsant medication are considered to have active epilepsy.(1)

The parents or caretakers are generally overanxious regarding the condition. Hence an early diagnosis of this condition is important to counsel them regarding certain benign conditions, to start specific treatment to attain remission and for giving advice regarding the prognosis to the parents. There are several Indian studies in the past which shows the prevalence of epilepsy to be were 572.8 (509.79-641.54) per 100, 000(2). Another study by Shah PA et al. found the age-specific prevalence was3.82/1000 (6-10 years), 3.44/1000 (11-14 years) and 2.33/1000 (15-18 years)(3).Prevalence studies from India suggest that epilepsy prevalence is similar to developed nations(4).There are limited studies in children in this part of our country to find the varying clinical pattern of epilepsy. Hence this study was undertaken to find out the pattern of epilepsy in children from one month to 18 years.

**METHODOLOGY:** This study was carried out in epilepsy clinic of paediatric department in a tertiary care hospital in Bangalore. All children who presented with epilepsy for a period of 12 months were included in the study. For the study, epilepsy was defined as two or more afebrile seizures unrelated to acute metabolic disorder or to withdrawal of drugs. Those children who had their onset of seizures within one month of age and those children with febrile seizures were excluded. In all the children who presented with epilepsy, a thorough history including age of onset, family history,

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developmental delay, aura, type of seizures, post ictal neurologic deficit and a detailed clinical examination was done. EEG was carried out in all cases of epilepsy. Neuroimaging was done when required.

A total of 98 children were included in the study. The classification of epilepsy is being modified periodically. The classification used in this study is according to The International Classification of Epileptic Seizures as studied by Senanayake et al., Koul et al. and Mikiti M.

| Total cases n = 98 | | | |
|---|---|---|---|
| | Generalized n = 54 | Partial n = 36 | Unclassified n = 8 |
| **Age at onset** | | | |
| 01m – 2 yrs | 18(33.33%) | 03(8.33%) | 07(87.5%) |
| 2 – 5 yrs | 20(37.03%) | 12(33.33%) | 00 |
| 5 – 10 yrs | 09(16.66%) | 15(41.66%) | 01(12.5%) |
| >10 yrs | 07(12.96%) | 06(16.66%) | 00 |
| Male : Female | 36:18 | 19:17 | 6:2 |
| Family History n = 98 | 06(6 %) | 06(6 %) | 0 |
| Developmental delay | 13 | 06 | 08 |
| Aura | 00 | 02 | 00 |
| Post Ictal Deficit | 00 | 02 | 00 |
| Neurocutaneous marker | 02 | 02 | 03 |
| EEG Abnormality | 35(64.8%) | 18(50%) | 8(100%) |
| Neuroimaging | 7(29.1%) | 16(44.4%) | 6(75%) |

Table 1: Epidemiology and characteristics of chilhood epilepsy

Out of 54 cases of generalized epilepsy, 45 cases (83.33 %) had tonic – clonic seizures followed by 5 cases (9.25 %) of tonic seizure, 3 cases (5.55 %) of myoclonic seizures and 1 case (1.85 %) of atonic seizure. Of 36 cases of Partial epilepsy, simple partial were present in 16 (44.44 %), complex partial in 12 (33.33 %) and 8 (22.22 %) had partial onset with secondary generalization. Out of 8 cases unclassified epilepsy, 5 (62.5 %) had multiple seizures in the form of generalized tonic clonic seizures and myoclonic seizures, 3 cases (37.5 %) had partial epilepsy with myoclonic seizures.

**DISCUSSION:** It is important to diagnose epilepsy as early as possible because specific treatment can be initiated at the earliest to attain control and to help the patients in attaining good intellectual, social and vocational outcome.

In this study, generalized epilepsy is the commonest type of epilepsy as noticed in several studies. Under the generalized epilepsy, generalized tonic clonic seizures are the commonest. Senanayake et.al found that in various cities in India, GTCS were the maximum ranging from 28.2% to 73.2% of generalized seizures. Shah PA et al. found that generalized tonic-clonic seizures (73.5%) was the commonest type of seizure observed. Koul et. al studied in rural Kashmir and found that GTCS constitute 72.6% of the total epilepsies. In our study, GTCS constituting 55.1 % is comparable to the above studies.

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The sex incidence is more in males compared to females in this study (66.6 %)which is comparable to other studies. This could be because generally, for any illness males are brought to medical attention when compared to females.

The age of onset of generalized epilepsy is important because many seizure syndromes are age dependent. Moreover it helps to define the long term prognosis.[5]In our study, generalized epilepsy had their onset in 33.33 % of cases between 1m and 2 years and 37.03 % between 2 – 5 year age group which is comparable to the study by Koul R et al.[6]

Partial epilepsy found in 36.7 % is less when compared to studies by Senanayake et. al., but is higher when compared to studies by Koul et. al.Simple partial motor seizures constituted 44.4 % of the cases followed by complex partial seizures in 33.3 % of the cases and partial seizure with secondary generalization in 22.2 % of the cases. These findings are comparable to studies by Anju A et al[7] who studied only partial epilepsy and documented 51% simple partial seizures, 45% complex partial and 3.8% partial with secondary generalized seizures. Partial epilepsy is rare below 3 years of age. This may be because the recognition of complex symptomatology is difficult by caretaker / parents in partial seizures and these younger patients have tendency for generalization of discharges either to one or both hemispheres. In this study, only 8.3 % of partial epilepsy had onset less than 2 years, 33.3 % had onset between 2 - 5 years, 41.66 % had onset between 5 - 10 years and 16.66 % beyond 10 years. Other studies by Daurella. L O et al[8] showed 38.3% of partial seizures occurring before 3 years.

Unclassified epilepsy which cannot be classified due to a variety of multiple types of seizures constituted a total of 8 (8.1 %) in our study.These findings are comparable to studies by Koul et. al who documented 9.5% of total cases and Senanayake et al who reported the distribution of unclassified epilepsy between 4.7-19.1 % from various Indian cities. In this study the common seizures types were combination of generalized tonic clonic seizure with myoclonic seizures in 62.5 % of the total of 8 cases followed by simple partial motor seizures with myoclonic seizures in 37.5 % of the cases. The age of onset of these seizures were less than 2 years in 87.5 % and 12.5 % between 5 - 10 years. This being unclassified epilepsy, patients with syndromes like Lennox Gastaut Syndrome come under this group. These findings correlated with studies by Kenou van Rijckevorsel.[9] These patients generally have major CNS structural abnormalities and hence manifest more commonly during infancy.

Family history is important while evaluating epilepsy patients because many syndromes have a familial predisposition and some may possibly have an autosomal dominant pattern of inheritance. Overall family history was present in 12 out of 98 cases (12.22 %) similar to studies by Koul R et al. This could be because the caretakers / patients tend to suppress the facts or they are unaware that they had seizures during their childhood.

Developmental history should be evaluated in all cases of epilepsy. If there is a prenatal, perinatal insult or CNS malformation, seizures starts from infancy and there will be developmental delay. As reported in studies by Koul R et al, mental retardation is the most common neurological abnormality in this study.28.5 % of cases had developmental delay. Similar findings were reported in studies by Blume WT.[10]

Clinical examination of the patients is important while evaluating patients with all types of epilepsy especially more so in partial seizures. Examination of skin may reveal various neurocutaneous markers like, hemangiomas, neurofibromas, café au lait spots, shagreen patch, Ash

leaf macules etc. which may help to arrive at specific etiology of seizures. In this present study, only six patients had café au lait spots, two in each type.

Neurologic evaluation is important in all epilepsy cases. In patients with partial seizures, post ictal neurologic deficit may be present. The presence of neurologic deficit following seizure helps in identifying the site of origin of seizure focus. In this study, 2 cases had post ictal neurologic deficit, both had simple partial motor seizures. However, studies by BlumeWT reported 28% of patients with neurologic deficit in partial seizures.

Long term EEG monitoring may be helpful to establish the diagnosis in unclassified epilepsy, to classify the type of epilepsy, to quantitate the number of seizures, prior to surgery, to localize the focus of onset of seizures and to prognosticate. EEG had revealed abnormality in 64.2 % of the cases in this study. This is comparable as reported from various studies by Lawson et al.[11]Abnormality in EEG was noted in 64.81 % of the generalized epilepsy, 50 % of the partial epilepsy and 100 % of the unclassified epilepsy.

With the advent of neuroimaging like CT and MRI, the detection of anatomic abnormalities in patients with epilepsy had increased. MRI is the imaging procedure of choice in the investigation of patients with epilepsy. The advantages of MRI include the use of nonionizing radiation, high sensitivity and higher specificity than a CT scan, multiplanar imaging capability, improved contrast of soft tissue, and high anatomical resolution. All patients with seizures may not require neuroimaging.

Abnormalities in neuroimaging are more common in patients who have partial seizures. In this study, abnormalities in neuroimaging were detected in 29.16 % under generalized epilepsy, 50 % under partial epilepsy and 66.6 % under unclassified epilepsy. Overall 27 cases (43.5 %) showed abnormality in CT scan out of 62 cases where CT brain was done. There are various studies showing varying results on CT scan of Brain. In one study Holmes et al[12] found that 46% of children had pathologic findings on CT scan brain whereas Anju A et al who studied only children with partial epilepsy, abnormal CT findings were noted in 68% of the cases. In this study also 50 % showed abnormality in partial epilepsy where CT scan was done.

**CONCLUSIONS:** Epilepsy is a common disorder in pediatric practice. For arriving at an early proper diagnosis, these patients have to be appropriately classified. For this, elicitation of specific and proper history is important regarding the sequence of events including aura, ictal and post ictal events. Family history and developmental history are contributory to the diagnosis.

The educational status of the caretakers or parents, especially mothers is helpful in eliciting a good history. Clinical examination is important in all cases. Neurologic investigations like EEG, CT Brain and MRI Brain are helpful in classification, treatment and to determine the prognosis. EEG must be done in all types of seizures other than febrile seizures to classify, to treat and to prognosticate. However EEG may be normal in certain generalized and partial epilepsies.

The overanxious parents must be counseled regarding the provocating factors, continuation of long term appropriate medical treatment and regarding certain benign nature of epilepsies. These help to prevent the recurrence of seizures, avoids discrimination at home, reduces school absenteeism and helps to lead a near normal life like other normal children and be a productive citizen to our country.

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