



A CLINICO-ETIOLOGICAL STUDY OF INCIDENCE OF PARTIAL SEIZURES PRESENTING TO A TERTIARY CARE HOSPITAL IN ELURU, WEST GODAVARI DISTRICT. A.P

Pediatrics

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ABSTRACT

Background: Of the 70 million persons with epilepsy worldwide, nearly 12 million are expected to reside in India, which contributes to nearly one-sixth of the global burden. The overall prevalence (3.0-11.9 per 1,000 population) and incidence (0.2-0.6 per 1,000 population per year) data from recent studies in India on general population are comparable to the rates of high-income countries despite marked variations in population characteristics and study methodologies.

Objective: To identify the etiology of focal seizures in children between 2 months -18 years. To determine the correlation between clinical features and diagnosis in children presenting with focal seizures.

Methodology: This is a prospective observational study carried for 2 years in 31 children presenting with partial seizures. This study included children aged 2 months to 18 years. The clinical presentation and the corresponding diagnosis of the partial seizures were documented.

Results: The partial seizures in this study found male and female ratio is 1.2:1 with male predominance. The most common presentation is focal with impaired awareness and focal to bilateral tonic clonic followed by focal with awareness. Neurocysticercosis is the common etiology in the present study group (29.03%), followed by idiopathic (22.5%). Neurotuberculoma is the next common etiology (16.1%).

Conclusion: Right sided focal seizures is more common than left side focal seizures. Inflammatory granulomas like NCC and neurotuberculoma were the most common etiology of focal seizures. Identification of exact etiology of focal seizure with appropriate investigation gives information for treatment and prognostication.

KEYWORDS

Focal seizures, Neurotuberculoma, Seizures, Neurocysticercosis

INTRODUCTION:

Of the 70 million persons with epilepsy worldwide, nearly 12 million are expected to reside in India, which contributes to nearly one-sixth of the global burden. The overall prevalence (3.0-11.9 per 1,000 population) and incidence (0.2-0.6 per 1,000 population per year) data from recent studies in India on general population are comparable to the rates of high-income countries despite marked variations in population characteristics and study methodologies¹.

Focal or partial seizure is a seizure that originates from a localized area of cerebral cortex and involves neurologic symptoms specific to that affected area of the brain. The behavioral manifestations of focal seizures relate not only to the region of the brain involved during the ictal discharge but also to the maturation of the nervous system and the integrity of the pathways necessary for clinical expression². Focal seizures are not infrequent in children. In fact, the most frequent childhood epilepsy is probably benign childhood epilepsy with centro-temporal spikes in EEG, also called as Benign Rolandic Epilepsy³.

The prevalence rate of epilepsy in India is 6.24/1000 population. In developing countries like India, more than 60 % of partial seizures are symptomatic. The causes of symptomatic partial seizures in children in India have been found to be somewhat different from those reported from the west.

So, these children with partial seizures require regular monitoring and need awareness of the burden of disease to evolve regular detection, management and prevention strategies. With this background, this study was done in a tertiary care centre, Eluru.

OBJECTIVE:

1. To identify the etiology of focal seizures in children between 2 months - 18 years.
2. To determine the pattern of focal seizures.

METHODOLOGY:

Inclusion Criteria:

Children between 2 months to 18 years presenting with partial (focal)

seizures to the paediatric department.

Exclusion Criteria:

Children with seizures following head injury were excluded from the study. Children whose parents are not willing to participate in the study were excluded.

This prospective observational study was carried out in children presenting with partial seizures from October 2018 to September 2020 in a tertiary hospital Eluru. A total of 31 Children aged 2 months to 18 years presenting with partial (focal) seizures, admitted to the wards of the Department of Paediatrics were studied for the etiology of partial seizures and its clinical presentation.

The information collected regarding all the selected cases was recorded in a Master Chart. Data analysis was done with the help of computer using MS-Excel, SPSS 22.0 (Trail version). Using this software, frequencies, percentage, range, mean, standard deviation, T-test and P-values were calculated. A p value<0.05 is shown to have significant relationship.

RESULTS:

Table1: Age Wise Distribution Of The Study Population

Age	Male	Female	Total
2 months to 1 year	1 (5.8%)	1(7.2%)	2 (6.5%)
1 to 5 years	1 (5.8%)	1(7.2%)	2 (6.5%)
5 to 10 years	8 (47.2%)	5 (35.6%)	13 (41.9%)
10 to 18 years	7 (41.2%)	7 (50%)	14 (45.1%)
Total	17 (100%)	14 (100%)	31 (100%)

The age of sample varied between 2 months to 18 years. The mean age of presentation was 9.17 years. Age distribution tabulation showed the highest incidence of cases in 10 – 18 years age group (14 cases), constituting 45.1%, followed by 5- 10 years age group (13 cases) accounting for 41.9%.

Table2: Gender Wise Distribution Of The Study Population

Gender	Subject
Male	17 (54.8%)
Female	14 (45.2%)
Total	31 (100%)

Of the 31 patients, 17 (54.8 %) were males and 14 (45.2 %) were females with a ratio of 1.2:1. Sex distribution showed a male preponderance.

Table 3: Distribution Of The Study Population Based On Clinical Seizure Type

Type of focal seizure	Subjects
FWS- Focal with awareness	9 (29%)
FWIA- Focal with impaired Awareness	11 (35.5%)
FTBTC- Focal to Bilateral Tonic Clonic	11 (35.5%)
Total	31 (100%)

Regarding the type of seizures, only 9 cases (29%) presented with FWA seizures, 11 cases (35.5%) had FWIA seizures and 11 cases (35.5%) had FTBTC.

Table 4: Distribution Of The Study Population Based On Duration Of Episode Of Focal Seizure

Episode in minutes	Subjects
< 5 min	18 (58.1%)
5 - 10 min	9 (29%)
>10 min	4 (12.9%)
Total	31 (100%)

Majority of the cases, i.e., 58.1% had seizure episode less than 5 minutes at presentation and 29% of cases had seizure duration of 5-10 minutes. Cases having duration of seizures >10 min is 12.9%.

Table 5: Distribution Of The Study Population Based On Limbs Involved In Seizures

Limbs involved	Subject
Right upper limb-RUL	10 (32.2%)
Left upper limb-LUL	7 (22.8%)
Right lower limb-RLL	4 (12.9%)
Left lower limb-LLL	4 (12.9%)
LUL,LLL	3 (9.7%)
RUL,LUL	1 (3.2%)
RUL,RLL	2 (6.4%)
Total	31 (100%)

In the present study, 17 cases (54.8%) have right side involvement in the form of abnormal movements of right upper limb or right lower limb, or both, while 15 cases (48.4%) have involvement of left side in the form of abnormal movements of left upper limb or lower limb or both. Among these cases, 10 cases (32.2%) have involvement of only right upper limb, 7 cases (22.8%) have involvement of only left upper limb, 4 cases (12.9%) have involvement of only right lower limb, 4 cases (12.9%) have involvement of only left lower limb. Cases with involvement of both left upper limb and left lower limb include 9.7% (3 cases), and 2 cases (6.4%) have involvement of both right upper limb and right lower limb. One child (3.2%) has involvement of right and left upper limbs at one time or the other.

Table 6: Distribution Of The Study Population Based On Other Presenting Symptoms

Complaints	Subjects
Nil	13 (41.9%)
Headache	2 (6.4%)
Vomiting	2 (6.4%)
Fever	2 (6.4%)
Blurring of vision	0
Altered sensorium	0
Cough	1 (3.2%)
Decreased appetite	0
Loss of weight	1 (3.2%)
Headache, vomiting	2 (6.4%)
Headache, blurring of vision	1 (3.2%)
Fever, cough	1 (3.2%)
Cough, decreased appetite	1 (3.2%)
Decreased appetite, loss of weight	1 (3.2%)
Headache, vomitings, fever	3 (9.6%)

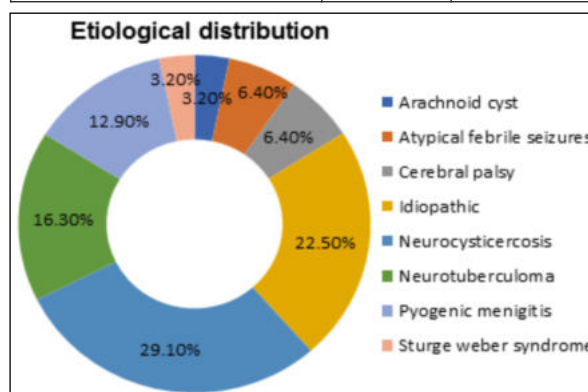
Headache, vomitings, fever, altered sensorium	1 (3.2%)
TOTAL	31 (100%)

In the present study, 13 cases (41.9%) presented only with complaints of focal seizures with no other symptoms. Among the study population, 58.1% have one or other presenting symptoms along with focal seizures which include headache, vomiting, fever, blurring of vision, altered sensorium, cough, decreased appetite and loss of weight. Cases having headache along with seizures are 6.4%, and cases having vomiting along with seizures are 6.4%. Children presenting with fever along with seizures include 6.4%, and children presenting with headache, fever and vomitings along with seizures are 9.6%.

Cases presenting with headache, vomiting, fever and altered sensorium are 3.2%, which raised suspicion of neurological infection. Cases having headache and vomiting include 6.4%, and 3.2% of cases presented with headache and blurring of vision. Children presenting with fever and cough are 3.2%. Cases having cough and decreased appetite include 3.2%, case having decreased appetite and loss of weight include 3.2%, which raised suspicion of tuberculosis infection.

Table 7: Distribution Of The Study Population Based On Etiological Factors

Diagnosis	Number	Percentage
Arachnoid cyst	1	3.2%
Atypical febrile seizures	2	6.4%
Cerebral palsy	2	6.4%
Idiopathic	7	22.5%
Neurocysticercosis	9	29.1%
Neurotuberculoma	5	16.3%
Pyogenic meningitis	4	12.9%
Sturge weber syndrome	1	3.2%
Total	31	100%



In the present study, neurocysticercosis is found to be the most common etiology constituting 29.1% of the cases, followed by idiopathic (22.5%). The next common etiology include neurotuberculoma and pyogenic meningitis accounting for 16.3% and 12.9% cases respectively. Other causes include spastic cerebral palsy and atypical febrile seizures accounting for 6.4% each, arachnoid cyst and Sturge weber syndrome accounting for 3.2% each.

DISCUSSION:

Partial seizures is the most common neurological disease of childhood, which causes a great impact on the social as well as economic aspect of the underdeveloped countries. Numerous relatively benign, episodic spells often are misdiagnosed and even treated as seizures. Therefore correct diagnosis and appropriate treatment should be more important⁷.

In a study done by Kramer et al.⁵, a cohort of 440 children observed and focal seizures account for 41.7% of seizure types in children. In the present study, a total of 31 children who presented with focal seizures were clinically examined and evaluated. Necessary radiological investigations were done.

The mean age of presentation is 9 years in the present study, whereas the mean age of presentation in the study done by Singhi et al.⁶, was 6 years.

In the present study, common age groups were 10 to 15 years (45.1%)

and 5 to 10 years age group (41.9%), which were almost the same.

In a study done by Singhi et al.⁶, the predominant age group was 4 to 10 years, which is comparable to the present study.

In a study done by NehalH.patel et al.⁷, where 200 children between age 1 month and 12 years were undergone CT for focal seizures, the predominant age group was 1 to 5 years, which constitute 40% of the cases, whereas in the present study, only 6.5% cases are in 1 to 5 years age group. In this study, 22% of children were in 1 month to 1 year age group, which is more compared to the present study, which is 6.5%. This disparity may be due to different age groups in these two studies. In the study done by NehalH.patel et al.⁷, the study group was 1 month to 12 years, whereas the present study includes children between 2 months to 18 years.

A clinical study to identify the possible etiology of complex partial seizures (focal seizures with impaired awareness) using magnetic resonance imaging brain findings and its implications on treatment was done by V.Nancy Jennifer et al.⁸. In the study, 64 children who were clinically diagnosed to have focal seizures with impaired awareness were subjected to MRI study of the brain. The study group was taken from 1 to 18 years. Among those 64 children, 46.8% of the cases were in the age group of 10 to 15 years, which was similar to that of the present study (45.1% in 10 – 18 years). Cases in the age group of 5 to 10 years constitute 35.9%, which were similar to the present study with 41.9% cases in that age group. In this study, 12.5% of cases were in the age group of 1 to 5 years, which was higher when compared to the present study (6.5%). This difference may be due to difference in the study criteria. This study was conducted in children of age 1 to 18 years, whereas the present study included children of age 2 months to 18 years.

In a study done by Neeraj Jain et al.⁹, where 172 children with focal seizures are included to study the role of EEG and CT scan in partial seizures (focal seizures), 22.09 % of children have focal seizures with awareness, which was comparable to the present study which has 29% in the study group. In this study, children having focal seizures with impaired awareness constituted 55.23% which was higher as compared to the present study which was only 35.5%. In this study, 22.67% of the children presented with focal to bilateral tonic clonic seizures which was less compared to the present study having 35.5% of the cases.

In a study done by Nehal.H.Patel et al.⁷, where 50 children with focal seizures were included to study the therapeutic relevance of focal seizures, 50% of the cases presented with focal seizures with awareness, which was higher compared to the present study which was 29%. Cases presenting with focal seizures with impaired awareness were 36%, which was similar to the present study which is 35.5%. Patients presenting with focal to bilateral tonic clonic were 14% in this study, which was low compared to the present study which is 35.5%.

Uri Kramer et al.¹⁰ have done neuroimaging studies in 143 children and adolescents with focal seizures. Among these, 22% of cases presented with focal seizures with awareness, which was similar to the present study with 29% cases. Children presenting with focal seizures with impaired awareness in this study were 31% which was similar to the present study having 35.5% cases. Similarly, cases presenting with focal to bilateral tonic clonic seizures were 46% in this study which is higher compared to the present study which has 35.5% cases in this group.

In the study done by Parihar RV et al.¹¹, 27.91% of the cases have focal seizures with awareness, which was comparable to the present study with 29% cases. Focal seizures with impaired awareness was seen in 72.09% of cases, which was very high as compared to 35.5% in the present study. There were no cases reported having focal to bilateral tonic clonic seizures in this study, whereas 35.5% of the cases were presented with focal to bilateral tonic clonic seizures in the present study.

In the study done by Singhi et al.⁶, one hundred neurologically normal children aged 3 months to 12 years with partial seizures of recent onset were studied prospectively for the clinical profile and etiology. The seizures were focal with impaired awareness in 65% and focal with awareness in 35%. Among these two groups, 21% of patients have secondary generalization. This study has not considered secondary

generalization (FTBTC) separately from FWA and FWIA. But in the present study and in studies done by Nehal.H.patel et al.⁷, Uri Kramer et al.¹⁰ and Neeraj Jain et al.⁹, FTBTC was considered separately from FWA and FWIA.

Among all these studies, the cases presenting with focal with awareness in the present study were similar to that of Parihar RV et al.¹¹. The cases presenting with focal with impaired awareness were similar to that of Nehal.H.Patel et al.⁷ and the cases presenting with focal to bilateral tonic clonic were close to that of Uri Kramer et al.¹⁰.

CONCLUSION:

- Inflammatory granulomas like NCC and neurotuberculoma were the most common etiology of focal seizures.
- Neuroimaging is a valuable tool in identifying the underlying etiology of focal seizures.
- MRI is helpful in cases of diagnostic dilemma between NCC and neurotuberculoma and also to diagnose cortical malformation.
- Identification of exact etiology of focal seizure with appropriate investigation gives information for treatment and prognostication.

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