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RESEARCH ARTICLE

Clinico etiological co-relation of seizure disorder in childhood diseases

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Abstract

Objectives
i. To study the incidence of seizures, ii. To evaluate the clinco-investigative profile of seizures between 1–16 years of age, iii. To find out aetiological patterns of seizures, to evaluate the outcome of seizures after therapy.
Setting: pediatric intensive care and ward, pediatric teaching hospital in sangli, Maharashtra.
Duration : 2years.
Design : observational study.
Participants: 258 patients of seizure disorders in childhood.
Methods: All the patients, their caretakers especially persons who had seen child convulsing were interviewed and thorough evaluation of patients was carried out according to the proforma with special emphasis on aetiological factors with detailed history and examination. Serial monitoring of various haematological and biochemical parameters were done. Statistical evaluation of various etiologies was done using P value.
Results and conclusion: age group 1-5yrs had maximum cases of seizures, commonest type being generalized tonic clonic seizure, motor symptoms being component. fever being most prominent clinical association. Febrile seizure being commonest presentation.

INTRODUCTION

Seizure disorders are the most common neurological disorders affecting 04 – 10 % of all children suffering at least one seizure in the first 16years of life.[1]
The incidence is highest in children younger than 3years of age with a decreas in frequency in older children. The incidence of epilepsy(recurrent unprovoked seizure) in children and adolescents seems relatively consistent across all populations studied ranging from 50 to 100/10,00,000 person per year.[3.] In most cases febrile seizures were reported to be the most common type seen in pediatric population and account for majority of seizure seen in children younger than 5 years age[2.] An observational study of clinic-etiological co relations of seizure disorders in childhood was carried out to study pattern of seizures occurring at rural hospital and its varied etiologies.

1. **Methods:**
2. this study was conducted at department of pediatrics,bharati vidyapeeth deemed university medical college and hospital,sangli(Maharashtra). All children age 1 to 16years with acute seizures (history of seizures at home

witnessed by relatives or seizures during hospitalization witnessed by staff) will be included in study. Study Period : from august 01 2013 to april 2015. 258patients with seizure disorder were included in the study. The study was approved by institution Ethics Committee. Patients were enrolled after written informed consent from parents/guardians/patients. Inclusion Criteria:

All children age 1 to 16years with acute seizures (history of seizures at home witnessed by relatives or seizures during hospitalization witnessed by staff) will be included in study.

Exclusion Criteria were:

Neonates ,age< 1 year or > 16 years of age , Children with repeated admissions were enrolled only once.

Seizure mimicking disorders will be excluded(annexure no 5) Children with metabolic causes will be excluded.

Results:

258 children were studied,out of which 176 fulfilled the inclusion criteria. Incidence was 9.44 %. Male preponderance was minimal with male : female ratio of 1.2 : 1. Age group 1 to 5 years had maximum i. e. 116 cases (65.90%) while age group 11 to 16 years had minimum i. e. 26 cases (14.75%). Monsoon months recorded maximum cases 96 (54.54%) with August contributing 19.88%, winter months registered lowest i. e. 12.01% with November sharing just 2.84% cases of the total.Generalised tonic clonic seizures were seen in 44.31% cases, Motor symptoms were the most predominant. Fever was a consistent feature present in 77.27% cases; rash (2.7%), and hepatosplenontegaly (10.9%) were the other common features.

Neurological findings observed during study were sensorial disturbances (33.3%), signs of meningitis (19.74%) and signs of raised intracranial tension (6.7%). 8 patients (4.5%) were brought in status epilepticus while 6.1% cases had neuro defleit at the time of admission.

The leading cause of seizures was febrile seizures (48.88%), out of which 58.13% belonged to 1 to 2 years of age. The incidence decreased with increasing age. Male : Female ratio was 1.3 : 1 .viral meningo-encephalitis was the next most common (14.20%) followed by pyogenic meningitis (4.54%). Epilepsy contributed 17.04%, while tuberculous meningitis cases were 1.13%, congenital malformations had their share with 6 cases.Amongst other varied aetiologies were 1 case each was of post traumatic seizure and subdural effusion.

Abnormalities in chest skiagram were seen (35.22%) 6.7% cases showed signs of raised ICT. 9 neurosonographies were done,3 were abnormal,out of which 1 had subdural effusion.

CSF examination was carried out in 84cases(47.725%) with 49.54% showing some abnormality. Isolation of organism showed a very low yield owing to exposure of patients to various antibiotics prior to admission. Bromide partition test which helps in diagnosis of partially treated meningitis, Latex agglutination test and Polymerase Chain Reaction (RCR) were not available.

EEG was abnormal in 125 cases out of total 172 cases in which it was done.CT scan abnormality was seen in 48 out of total 54 cases. Basal exudates were present in 2cases, cerebral edema in 17 cases, while hydrocephalus showed its presence in 2cases,ventriculitis in 6case,multiple infacrcts in 9cases,while calcification and subdural effusion comprised of two cases each. Congenital malformation consisted of 8cases.

72.7% cases had shown good response to drug therapy while 19.88% responded partially. 3.97% showed poor response and 3.40% of cases died during hospitalisation. Neurological sequelae persisted in 17.14% cases of meningitis at the time of discharge.

TABLE NO. 2 : SEASON WISE DISTRIBUTION OF CASES

SEASON	CASES	PERCENTAGE
SUMMER	55	31.25
MONSOON	96	54.54
WINTER	25	14.20

TABLE NO. 3 : SEX WISE DISTRIBUTION.

SEX	Frequency	Percent
F	76	43.50
M	100	56.50

Total	176	100.00

AGE WISE DISTRIBUTION OF CASES.

Age group	Frequency	Percent
1-5	116	65.90
6-10	34	19.31
11-16	26	14.75

MODE OF PRESENTATION.

TYPE OF SEIZURES	CASES	PERCENTAGE
GENERALISED TONIC CLONIC	78	44.3
ABSENCE	2	1.1
FOCAL	30	17
INFANTILE SPASMS		
MYOCLONIC	11	6.25
FEBRILE	47	26.7
STATUS EPILEPTICUS	8	4.54

AETIOLOGIC DISTRIBUTION.

AETIOLOGY	CASES	PERCENTAGE
FEBRILE SEIZURES	86	48.88
PYOGENIC MENINGITIS	8	4.54
TUBERCULOUS MENINGITIS	2	1.13
VIRAL ENCEPHALITIS	25	14.20
SYNDROME	8	4.54
STATUS EPILEPTICUS	8	4.54
EPILEPSY	30	17.04
MISCELLANEOUS:-		
MALFORMATIONS	6	3.40
SUBDURAL EFFUSION	1	0.56
POST TRAUMATIC	1	0.56
SUBARACHNOID HAEMORRHAGE	1	0.56
TOTAL	176	100

DISTRIBUTION OF CLINICAL FEATURES AT THE TIME OF ADMISSION.

CLINICAL FEATURES	CASES	PERCENTAGE

FEVER	136	77.27
RASH	4	2.7
HEPATOSPLEENOMEGALY	16	10.9
SENSORIAL DISTURBANCES	59	33.3
SIGNS OF RAISED ICT	12	6.7
SIGNS OF MENINGITIS	35	19.7
STATUS EPILEPTICUS	8	4.5
NEURODEFICIT	9	6.1

OUTCOME OF MENINGITIS CASES.

OUTCOME	CASES	PERCENTAGE
IMPROVED	30	85.71
PARTIALLY IMPROVED	2	9.5
NEUROLOGICAL SEQUELAE	6	17.14
DEATH	1	4.76

RESPONSE TO THERAPY.

RESPONSE	CASES	PERCENTAGES
GOOD	128	72.7
PARTIAL	35	19.88
POOR	7	3.97
DIED	06	3.40
TOTAL	176	100

Discussion :

Seizure is a medical emergency for which patient is brought to paediatric wards by parents or caretakers. However, till today seizure remains a perplexing problem for the treating paediatrician due to its varied etiology and relative scarcity of clinical history and the relevant information provided by some of the illiterate and ignorant parents or caretakers. Hence this study was undertaken to find out the clinico-etiological correlation of seizure disorders in childhood between age group of 1 to 16 years.

Total number of admissions during the course of study were 4025. Out of these, total number of cases of seizures were 258. Study population i. e. 1 to 16 years comprised of 176 cases, incidence rate being 9.44 % of study age group.

96 cases (54.52 %) were recorded in monsoon months i. e. June to September which was closely followed by summer months i. e. 55 cases (31.25 %). Winter months had lowest number of cases 25, incidence being 14.20 % (Table no. 2). Maximum number of cases of seizures i. e. 35 (19.88 %) wre admitted in August month, while minimum in November month, i. e. 5 (2.84 %) (Table no. 1).

M. V. Phadke[65] found maximum number of cases in hot summer months while minimum cases in monsoon months. This study recorded contrasting evidence to her study. It was found that out of the total 176 cases,116 cases(65.90%) belonged to 1-5yrs age group,34cases(19.31%) beloged to 6-10yrs age while 26 cases belonged to 11-16yrs age group comprising a percentage of 14.75%. Thus 116 cases(65.90%) cases comprised of toddlers and pre school groups.

Majority of the patients, 78 cases (44.32 %) had generalised tonic clonic seizures, while 30cases(17%) had focal seizures. myoclonic seizure cases were 11(6.25%)while satus epilepticus comprised of 8cases (4.54%). Least observed were absence type with only 2cases(1.1%).**Holmes et a**[136], **Duchany et al**[38] found increased evidence of complex partial seizures as compared to simple partial seizures **searpa et al**[39] however described motor seizures in 74.6 %, complex sensory motor seizures in 17.7 % and the remaining were secondarily generalised.

Fever was the presenting complaint along with seizures in 136 cases (77.27%). Presence of fever which usually indicates underlying infectious process was present as the commonest feature, Rash was present in 4 cases (2.7%),

severity of which varied. Enlarged liver and / or spleen were palpable in 16 (10.9%) cases. Amongst variety of neurological findings observed in the study, altered sensorium ranging from drowsiness to deep coma, was present in 59cases (33.35%). Signs of raised intra cranial tension were observed in 12cases (6.8%). 35 cases (19.7%) had nuchal rigidity, Kerning sign and Brudzinki's sign suggesting meningeal involvement. 9 patients presented with neurological deficits (6.1%).

Febrile seizures constituted the maximum i.e. 86cases (48.88%) of seizers. Next major cause of convulsions was viral encephalitis contributing 25 cases (14.25%) formed the second place in causation. Epilepsy constituted 30cases(17.04%) pyogenic meningitis occupied fourth place in causation with 8 cases (4.54%). Tuberculous meningitis was responsible for two cases (1.13%). 46 cases (26.13%) out of the total 176 were of non-infectious causes.

Sturge Weber syndrome diagnosed clinically and confirmed by CT scan formed one out of 6 cases of congenital malformations.Subdural effusion was also observed in one of the patients. Last but not the least were the seizures following trauma which constituted one case.

Age wise distribution of seizures, total number of patients with seizures in 1 to 5 years were 116, out of which 86 had febrile seizures (48.86%),thus febrile conculsion were commonest in younger age group. It was found that, amongst 8 cases of pyogenic meningitis, 5 cases (62.5%) had shown an increase in CSF protein with decreased sugar levels. while in 3 cases (37.50%) protein were increased though sugar was normal.

R. Reddy et al[61] found increased protein in 98.7% cases and low sugar level in 68% of cases. **Mrs. Ghosh** and **B. Ghosh Roy**[84] found low sugar and high protein, pathognomic of pyogenic meining in 71.05% cases. Findings of present study are in accordance with above studies.

Upadhyaya et al[84] found that in about 3/4th cases (76.6%) proteins were raised, sugar were reduced in (69.3%) cases. However, sugar content was normal in 31.55% cases. **Udani et al**[66] found typical CSF changes of tuberculous meningitis in 73% of cases while in 16% of cases sugar and protein were normal. The present study can not be compared with the above studies due to less availability of tuberculous cases.

Out of the total 35 cases of meningitis/meningoencephalitis 30 improved completely (85.71%) while 2 cases (9.5%) recovered partially. 6 patients (17.14%) had persistent neurological deficit at the time of discharge and 1 patients succumbed to his illness due to tuberculous meningitis with tuberculoma.

These results are comparable with the **Kabra et atl**[87] study. **Doerr et al**[88] documented mortality rate of 16%. Mortality due to meningitis, especially pypgenic variety is very low in present study. This can be attributed to a high index of suspicion, early lumbar puncture and aggressive management with appropriate antibiotics and steroids, where indicated. When the present study is compared with the study by **Chaturvedi and Kishore**[81], similar results have been found. However a larger series with aetiologically matched subjects in various age groups will be of help in establishing the relationship between age and outcome and in reducing the discrepancies of various studies.

EEG was possible in total 172 cases of which 47 records were normal while 125 records were abnormal. Epilepsy which contributed 30 cases (17.04%) out of total tally of 176 cases,was comprised of 18 cases showing generalised tonic clonic seizures, 7 cases showing complex partial seizures and 5 cases showing myoclonic/simple partial seizures. All 47 normal records belonged to the group of febrile seizures.**Johshi et al**[31] showed partial epilepsy in 80%, generalised in 20% (primary generalised 15% and secondary generalised in 5%). These results do not match with the present study as the above study was carried out in neurological centre on a large study population.

CT scan could be done in 54 cases. 6 CT scans were normal while 48 had shown some organic lesion. Basal exudates were seen in 2 cases, communicating hydrocephalus in 2 case, both of these conditions belonging to tuberculous meningitis. 17 cases showed cerebral edema while subdural effusion was evident in one case. One case showed cortical atrophy on right side and calcifications confirming the clinical diagnosis of Sturge Weber syndrome. Multiple infarcts/gliotic changes were seen in 9 case .Ventricultis was seen in 6cases .subdural effusion was seen in two cases,while congenital malformations occupied 8cases.(14.81).

So incidence of CT abnormalities in present study is 73.3%, comparable with other studies by **Gastaut**[79] (63%), **Vidwan**[88] (74.8%), **Misra et al**[40] (79.3%) and **Jaykumar**[35] (65.4%).

128 cases (72.7%) responded very well to medications, 35 cases (19.88%) showed partial response, 7 cases (4.58%) were refractory/poor response to treatment while 6 patients (3.40%) died during the course of treatment.

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