

Etiological Evaluation of Convulsions in Children between 1 Month to 5 Years of Age in Tertiary Care Hospital, Guntur.

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ABSTRACT

Introduction: Seizure is a common problem evaluated in pediatric emergency department. The different causes of seizures are febrile seizures, CNS infections, metabolic, developmental defects, traumatic brain injury, vascular accidents, brain tumors and idiopathic or epilepsy. Current research aimed to study the etiology of convulsions in children between 1 month to 5 years of age admitted in pediatric ward, Government General Hospital, Guntur. To assess the common incidence of convulsions in children of age 1 to 5 years admitted to pediatric ward, Department of Pediatrics, Government General Hospital, Guntur.

Material and methods: Our study was retrospective, descriptive study. 100 cases admitted to pediatric ward, Government General Hospital, Guntur with convulsions in the age group of 1 month to 5 years during the period of July 2018 and April 2019. Study was done by detailed history, through physical examination and relevant investigations including complete blood counts, serum electrolytes, serum glucose, serum calcium, CSF analysis, EEG and neuroimaging (CT/MRI brain) studies. Variables recorded were demographics, clinical presentation, laboratory investigations, EEG and neuroimaging.

Results: The most common cause of seizures in our study was febrile seizures (32%). About 24% cases were due to epilepsy (idiopathic or unprovoked) and 33% cases were symptomatic seizures of various causes like CNS infection, metabolic, traumatic, vascular etc. Remaining 11% were due to other miscellaneous causes.

Conclusion: This was the hospital based retrospective, descriptive study to know the etiology of convulsions in children between 1 month to 5 years. Convulsions in children can be due to various underlying pathology. In our study most common cause of convulsions was febrile seizures, followed by epilepsy and symptomatic seizures of infective etiology of CNS, viral encephalitis being the most common.

Keywords: Seizures, Febrile Convulsions, Symptomatic Seizures, EEG, Viral Encephalitis.

brain insult. Acute symptomatic seizures occur due to CNS infections, metabolic and electrolyte disturbances, traumatic brain injury, vascular accidents, brain tumors, CNS toxicity.^{1,3} Approximately 5% children with infection of CNS have acute symptomatic seizures at the time of infection.⁴ Epilepsy is a seizure disorder when two or more unprovoked convulsions occur in a time frame of more than 24 hours apart.⁵ Prevalence of Epilepsy is higher in developing countries due to high incidence of CNS infections, birth injuries and perinatal birth asphyxia.⁶ A seizure is may be the manifestation of a serious underlying systemic or CNS disorder that requires aggressive stabilization, resuscitation, relevant investigations, continuous monitoring and treatment. Current research aimed to study the etiology and to assess the common incidence of convulsions in children of age 1 month to 5 years admitted to pediatric ward, Department of Pediatrics, Government General Hospital, Guntur.

MATERIAL AND METHODS

Our study was retrospective, descriptive study. This study was done on 100 cases admitted to Pediatric department ward, Government General Hospital, Guntur with convulsions in the age group of 1 month to 5 years during the period of July 2018 and April 2019.

Inclusion criteria: Children, 1 month to 5 years of age who presented with convulsions.

Exclusion criteria: Children less than 1 month and more than 5 years of age. Seizure cases that went discharge against medical advice. Seizure cases who expired immediately after hospitalization before diagnosis was made.

The study was done by detailed history, thorough clinical examination and relevant investigations like Complete Blood Picture, CSF analysis, Blood Sugar, Serum Calcium, EEG and Neuroimaging (CT/ MRI Brain). Variable factors recorded were demographics, clinical presentation,

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INTRODUCTION

Seizure is a common problem evaluated in Pediatric emergency department. The different causes of seizures are febrile convulsions, symptomatic seizures, unprovoked or idiopathic seizures or Epilepsy.¹ Febrile seizures are most common among early childhood. It has been estimated that 2-4% of children were affected by febrile seizures. Boys are commonly affected than girls.² Symptomatic seizure is defined as clinical seizure occurring at the time of a systemic insult or in close temporal association with a documented

Variable factors	No. of cases		Total
	Male	Female	
Age			
1M – 1Y	10	12	22
1Y – 3Y	27	15	42
3Y – 5Y	17	19	36
Type of seizures			
Generalized	94		
Focal	6		
Positive Past History	28		
Positive Family History	12		
Abnormal Development History	9		

Table-1: Distribution of variable factors associated with convulsions (N=100)

Symptoms	No. of cases	Percentage (%)
Fever	68	68%
Vomitings	25	25%
Lethargy	16	16%
Irritability	22	22%
Gastroenteritis	8	8%
Jaundice	2	2%
Neurological signs		
Altered sensorium	36	36%
Focal neurological deficit	5	5%
Meningeal irritation	12	12%

Table-2: Distribution of clinical presentation associated with convulsions (N=100)

Investigations	No. of cases with abnormal findings	Percentage
Serum glucose (<45mg/dl) (N=100)	5	5%
Serum calcium (<8.4mg/dl) (N=100)	16	16%
Abnormal CSF findings (N=56)	21	37.5%
EEG (N=70)	29	41%
Neuroimaging (CT/MRI brain) (N=40)	32	80%

Table-3: Results of various investigations

Etiology	Age distribution			Total
	1M – 1Y	1Y – 3 Y	3Y – 5Y	
1. Febrile seizures	6	18	8	32
2. Epilepsy	2	12	10	24
3. Symptomatic seizures	11	10	12	33
(i) Viral encephalitis	-	5	7	12
(ii) Pyogenic Meningitis	4	1	-	5
(iii) Tubercular Meningitis	-	3	1	4
(iv) Hypocalcaemia	3	-	-	3
(v) Hypoglycemia	2	-	-	2
(vi) IEM	2	1	-	3
(vii) Head injury	-	-	2	2
(viii) ICSOL(NCC)	-	-	2	2
4. Others	3	2	6	11

Table-4: Etiology of convulsions with age wise distribution

laboratory investigations including Serum calcium, Blood Sugar, CSF analysis, EEG, CT/ MRI brain. As the present study was a descriptive study no statistical analysis was done. The various data were expressed as percentages.

RESULTS

The table 1 shows of 100 cases incidence of convulsions was maximum in the age group of 1yr to 3yrs 42% (n=42). 54 cases (54%) were male and 46 cases (46%) were female thus male to female ratio was 1.17:1. Maximum numbers of cases were generalized tonic clonic seizure type. 94 cases (94%) were generalized and 6 cases (6%) were focal seizures. Positive past history of convulsions was present in 28% of cases. 12% had positive family history. 9% had abnormal developmental history with global developmental delay.

Table 2 shows fever was the predominant symptom in 68% of cases followed by vomitings 25% and irritability in 22% of cases. Among neurological signs 36% had altered sensorium, 12% had meningeal irritation and 5% had focal neurological deficit.

Table 3 shows abnormalities in various investigations of blood, CSF, EEG and neuroimaging etc. Serum calcium and blood sugar levels were done in all cases with convulsions, out of which 16 cases had low serum calcium (<8.4mg/dl) and 5 cases had low serum glucose (<45mg/dl) levels. We did CSF analysis in 56 cases, out of which 21 cases (37.5%) had abnormal CSF analysis like elevated proteins, pleocytosis etc.

EEG was done in 70 cases, out of which 29 cases (41%) had abnormal EEG changes.

Radio imaging (CT/MRI Brain) was done in 40 cases, out of which 32 cases (80%) had abnormal CT/MRI findings like hydrocephalus in 8 cases (25%) basal exudates in 4 cases (12.5%), Neurogranulomas in 2 cases (6.25%), infarcts in 2 cases (6.25%) edema in 6 cases (18.75%), other changes like HIE, cerebral atrophy etc. in 10 cases (31.5%).

Table 4 shows age wise distribution of various etiologies associated with convulsions. Febrile seizures were the commonest i.e. 32 cases (32%) in our study, out of which 18 cases (56.25%) were in the age group of 1 year to 3

years, followed by epilepsy is the next common etiological factor seen in 24 cases (24%) which account up to 56 cases. Out of remaining 44 cases, symptomatic seizures of various etiologies like viral encephalitis 12 cases, pyogenic meningitis 5 cases, TBM 4 cases and other metabolic causes 7 cases, (hypocalcaemia 2 cases, hypoglycemia 2 cases, IEM 3 cases), head injury 2 cases, ICSOL(NCC) 2 cases. Remaining 11 cases had various other miscellaneous causes.

DISCUSSION

The present study was done to know the various etiologies for convulsions in the age group between 1 month to 5 years who were admitted in Pediatric department, Government General Hospital, Guntur, over a period of 10 months.

In the present study commonest cause of convulsions was febrile seizures i.e. 32 cases (32%) out of which 18 cases (56.25%) in between 1yr – 3yrs of age similarly reported by Bhandari and et., al.⁷ 20 cases were males, so male to female ratio is 1.6:1. Preponderance of convulsions in males was also noted in the study of Sehagal H., Bala K, et al.⁸ In the present study Generalized seizures were 94%, focal seizures were 6%, similar results were observed by Ramakrishnan. K and Thomas K et al.⁹

Our study revealed the commonest cause of acute symptomatic seizures is CNS infections (21/44). Viral encephalitis 27%, pyogenic meningitis 11%, Tuberculous Meningitis 9%, Neurocysticercosis 4.4%, all metabolic causes 18.2% (like IEM, hypocalcemia, hypoglycemia etc). Infections were the predominant cause of acute symptomatic seizures. Our study was consistent with findings of Murthy et. al and Richard Idro et al which revealed CNS infections as most common cause of acute symptomatic seizures.^{10,11}

The age specific incidence of pyogenic meningitis presenting as seizure was highest in first year of life, 4 cases out of 5 i.e 80% and this is consistent with Haungchoo et al and Akpede GO et al.^{3,12}

The incidence of acute symptomatic seizures due to metabolic insult was highest in age groups 1month – 1 yr consistent with Haung choo et al³ and Keating JP et al.¹³ In our study 24% cases were epileptic or idiopathic. Out of 24 cases majority were i.e. 21 cases (91%) were generalized and out of 24 cases, 22 were beyond 1 year of age. Similar findings were noted in the study of Riwiza et al.¹⁴ In our study 9% of epileptic cases were associated with cerebral palsy and mental retardation syndromes with developmental delay.

Limitations of the study

The details of other causes like suspected IEM could not be specified due to lack of higher investigations in our setup.

CONCLUSION

This was the hospital based retrospective, descriptive study to know the etiology of convulsions in children between 1 month to 5 years. Convulsions in children can be due to various underlying pathology. In our study most common cause of convulsions was febrile seizures, followed by epilepsy and symptomatic seizures of infective etiology

of CNS, viral encephalitis being the most common. The majority of seizures were generalized type. A detailed history, thorough physical examination and relevant investigations are useful to know the cause of convulsions and can be treated accordingly.

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