International Journal of Research and Review
www.ijrrjournal.com E-ISSN: 2349-9788; P-ISSN: 2454-2237

Original Research Article

Clinico-Etiological and Socio-Economic Profile of Children (1-12 Years of Age) With Epilepsy

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ABSTRACT

Epilepsy is a significant cause of morbidity and mortality in children. A comprehensive clinico-etiological and socio-economic data on epilepsy is crucial in implementing an effective management strategy. Therefore, this study was undertaken to delineate the key clinico-etiological and socio-economic data, which can be used in identification and effective management of epilepsy in the society. In this prospective study 100 consecutive cases of epilepsy in the age group of 1-12 years enrolled in the seizure clinic of the multispecialty, post graduate teaching, Govt. hospital in north-west part of Delhi were studied.
The study revealed that in most of the cases the onset of seizure started before the age of 10 years (85% of total cases), and male: female ratio was 1.17:1. GTCS was the commonest type of seizure (66%) followed by CPS (24%). Idiopathic epilepsy was recorded in 51%, and among these GTCS was recorded in 87% of cases. In symptomatic epilepsy (49% of total cases), 47% cases were found to be due to Neurocysticercosis (NCC). Strong association was found between type of seizure and etiology (P value 0.000). 89% of cases of epilepsy due to NCC had age of onset after 5 years which is higher as compared to Idiopathic Epilepsy. Majority (71% of patient) come were from low income groups.

Key words: Epilepsy, Seizure, GTCS, CPS, NCC

INTRODUCTION

Epilepsy is a condition characterized by recurrent (two or more) unprovoked seizures more than 24 hours apart. Seizures are common neurological disorder in pediatric age group and a cause of panic for parents. [1] Seizure afflicts almost 5% of children. This is also the commonest cause for referral to pediatric neurologic clinics. It is estimated that 75% of cases of epilepsy have their onset before 25 years of age. Generalized Tonic Clonic seizure type is the most common followed by partial seizure.[2] These are associated with a significant morbidity and mortality. Comprehensive data on the magnitude of the problem is crucial in indentifying and managing these illnesses. These along with paucity of data from this part of world had promoted us to undertake this study. The aim of the study is to clearly delineate the clinico-etiological and socio-economic features associated with epilepsy so that it can be identified and managed at an early age.

MATERIALS AND METHODS

This was a prospective observation study carried out on 100 consecutive children between the age group of 1 to 12 years who were enrolled in the seizure clinic of multispecialty Govt. hospitals in North-West Delhi from 2009 onwards. Subjects were selected after matching inclusion and exclusion criteria from those who agreed to take part in this study.

Inclusion Criteria:

A. Child having 2 or more seizure episodes more than 24 hours
B. Child on anticonvulsant therapy at the time of study
C. Child with EEG and Neuroimaging (CECT) done
D. Child with parents who can give a coherent history.

Exclusion Criteria:

A. Child with history of typical febrile convulsion.
B. Child in acute infective state.
C. Child having seizures after any medication or toxins.
D. Child having congenital heart disease.
E. Child having any other gross congenital anomalies.
F. Child with any neurological deficits.
G. Child whose parents cannot give coherent history.

An under mentioned proforma was prepared to collect the clinico-etiological and socio-economic data of the patients.

Proforma for recording Clinico-Etiological and Socio-Economic data

Clinico-Etiological data / profile	Socio-Economic data / profile
Name: Age (Yrs.): Sex: Etiological diagnosis after EEG/Neuroimaging: Seizure type: Seizure activity in last one year: None/1 or < 1 per month/>1 per month For how long is on ACT: No. of drug(s) prescribed: 1/>1 Pharmacologic name of ACT: Any h/o seizure episode after start of ACT: (Yes=1; No=0) Other chronic diseas in child: (Yes=1; No=0) If yes, nature of disease	Current age Sex (Male=1; Female=0) Age of onset (Months and Years) Age at last attack Family history Seizure in siblings (=3) Seizure in 1st degree relative (=2) Seizure in 2nd degree relative (=1) None (=0) Parental consanguinity Present (=1) Absent (=0) Educational history of patient Educational status of the parents (Father & Mother both) Illiterate (=3) Primary (=2) Secondary (=1) More than Secondary (=0) Monthly income group Low (=2) Middle (=1) High (=0) Areas of residence J-J-cluster (=2) Rural (=1) Urban (0) Mode of Water supply MCD (=3) Boring pipe (=2) Hand Pump (=1) Any other (=0) Immigrants Yes (=1) No (=0) Main health care facility availed Hospital (=3) Dispensary (=2) General practitioners (=1) d.Others (=0)

EEG and CECT findings were recorded in all cases. Education of parents was divided into four categories: illiterate, primary, secondary and more than secondary. We categorized the parents of the patients according to their monthly income i.e. Low income group, whose income was less than 5,000 / month. Middle income group included families with income between Rs. 5,000 to Rs. 20,000 / month and high income group included families with income more than Rs. 20,000 / month. Area of residence was grouped into three categories viz. J-J Cluster, rural and urban.

RESULTS

In this prospective study 100 consecutive children of epilepsy in the age group of 1-12 years enrolled in the seizure clinic were studied. Majority of Children (87%) had onset of epilepsy before 10 years (Table1). 54% cases were male and 46% were female; the male: female ratio was1.17:1

Table 1: Age of Onset wise distribution

Age of Onset(Yrs)	Frequency	Percent
<5	29	29.0
5-10	5	58.0
>10	13	13.0
Total	100	100.0

Idiopathic epilepsy was recorded in 51% cases while symptomatic epilepsy was observed in the remaining 49% cases. Amongst the symptomatic group, epilepsy due to Neurocysticercosis (NCC) was most common (47 / 49) (Table2). Out of 51 cases of idiopathic epilepsy 30 were male and 21 were female, while epilepsy due to NCC was almost equal in male and female. No association found between etiology of epilepsy and gender. (P value 0.433).

Table 2: Etiology of epilepsy by CECT/EEG

Etiology of Epilepsy by CECT/EEG		Frequency	Percent	Total Percent
Idiopathic epilepsy/ Epilepsy of unknown etiology	Abn. EEG	37	37.0	51.0
	Abn. EEG s/o Abs. Sz.	3	3.0	
	Both CECT & EEG Normal	11	11.0	
Epilepsy due to remote symptomatic etiology	NCC	47	47.0	49.0
	Infract	1	1.0	
	Tuberculoma	1	1.0	
	Total	100	100.0	100.0

Out of 51 cases of idiopathic epilepsy 45 (88%) had their onset before 10 years, with almost equal incidence before 5 yrs and between 5-10 yrs. Epilepsy due to NCC occurred mostly between 5-10 Cases of idiopathic epilepsy 45 (88%) had their onset before10 yrs, with almost equal incidence before 5 yrs and between 5-10 yrs. Etiology and age of onset of epilepsy were statistically associated (P < 0.020) (Table3)

Table 3: Relationship between Etiology of Epilepsy by CECT/EEG and Age of Onset

Etiology of Epilepsy by CECT/EEG		Age of Onset(Years)			Total
		<5	5-10	>10	
Idiopathic epilepsy/ Epilepsy of unknown etiology	Abn. EEG	18	14	5	37
	Abn. EEG s/o Abs. Sz.	1	2	0	3
	Both CECT & EEG Normal	3	7	1	11
Epilepsy due to remote symptomatic etiology	NCC	5	35	7	47
	Infract	1	0	0	1
	Tuberculoma	1	0	0	1
	Total	29	58	13	100

GTCS was the most predominant seizure type (63%) followed by CPS (24%). GTCS was noted in 44 children out of 51 cases of idiopathic epilepsy (86.3%) and out of 47 cases of NCC, 29 (61.7%) cases presented with partial seizure (CPS& SPS) and rest (38.3%) had GTCS. Etiology of epilepsy and type of seizure were strongly associated (P value 0.000).

Table 4: Relationship between Etiology of Epilepsy by CECT/EEG and Type of Seizure

Etiology of Epilepsy by CECT/EEG		Seizure type				Total
		ABS	CPS	GTCS	SPS	
Idiopathic epilepsy/ Epilepsy of unknown etiology (n=51)	Abn. EEG	0	2	35	0	37
	Abn. EEG s/o Abs. Sz.	3	0	0	0	3
	Both CECT & EEG Normal	0	2	9	0	11
Epilepsy due to remote symptomatic etiology (n=49)	NCC	0	19	18	10	47
	Infract	0	0	1	0	1
	Tuberculoma	0	1	0	0	1
	Total	3	24	63	10	100

46% of patients had recurrence of seizure after start of ACT and 14% of cases had positive family history of seizure.

Table 5: shows distribution according to education of parents, family income and the type of health care facility availed.

Distribution according to education of parents		
	Father Freq. (%)	Mother
More than secondary	17(17%)	10 (10%)
Secondary	41 (41%)	26 (26%)
Primary	25 (25%)	14 (14%)
Illiterate	17 (17%)	50 (50%)
Total	100 (100.0)	100
Distribution according to family income		
Middle	29 (29%)	
Low	71 (71%)	
Total	100 (100.0)	
Distribution according to Main Health Care Facility Availed		
HCF availed	Frequency	Percent
Others	17	17
General practitioner	44	44
Dispensary	21	21
Hospital	18	18
Total	100	100

Significantly more number of mothers of children with epilepsy were illiterate (50%) than Fathers (17%). 71% and 29% of children with epilepsy were from low and middle income group respectively and no child was from high income group. Majority of the cases (83%) were immigrant to Delhi. 44% of cases went to general practitioners for their health related problem while only 21% and 18% availed dispensary and hospital services respectively (Table 5).

DISCUSSION

In our study we found that out of 100 cases, 87 children experienced their first episode of epileptic seizure before 10 years of age with maximum number of cases (58%) had their onset between 5-10 years of age. Berg et al. [3] reported in their study that 31% cases had onset of seizures between 6-10 years, 23.5% cases had onset between 1-3 years, 17.9% of cases between 4-5 years. Only 13.7% had their onset between 11-15 years. In our study median age on onset of seizure was 7 yrs.

Present study found slight male preponderance of epilepsy with male to female ration of 1.17:1. While some studies found male preponderance in seizure [4,5] but Berg et al., [3] Aziz et al. [6] did not found any such greater incidence in male.

Generalized seizures were most common (66%) with 63% had GTCS and 3% had Absence Seizure. Complex partial seizure was second most common type (24%) followed by simple partial seizure (10%). Eriksson and Koivikko [7] reported similar findings as generalized seizure in 55% and partial seizure in 21% In our study 51% cases had unprovoked seizure of unknown etiology (idiopathic). In all these cases CECT were normal but 78.4% of them had abnormal EEG and 21.6% had normal EEG. In one of the study of clinical and EEG correlation of epileptic chronic seizure in children showed, 19% to have normal EEG. [8]

Ring enhancing lesions are the commonest CT abnormality found in children complaining of seizures. [9] In India, due to the high incidence and prevalence of tuberculosis, most of the earlier researchers believed that these lesions were tuberculoma. However, the documentation of their spontaneous resolution without any specific treatment apart from antiepileptic therapy led to the proposition of alternate etiologies. [10]

Further studies including those which included histological examination of these ring lesions by stereotaxic or open brain biopsy found neurocysticercosis to be the cause in majority of patients. [11] Since these invasive procedures cannot be put into routine use for obvious reason, CT criteria

were proposed for differentiating tuberculomas from neurocysticercosis. [12]

In our study according to neuroimaging (CECT), 47% patients were found to have neurocysticercosis (NCC) and 1% had tuberculoma. Studies of highly selected patients with epilepsy in hospital settings from Latin American countries [13-15] whose diagnoses were based on CT, report NCC as the cause of epilepsy in 30-50% of patients.

The study also revealed that out of the 51 cases with idiopathic epilepsy, 22 had onset before 5 years of age and 23 had onset between 5-10 years of age. While majority of patients with NCC had onset at more than 5 Years (89.3% of which 74.5% experienced their first seizure between 5-10 years of age). Similar finding had been found by other authors. [16-19] Kalra et al. found mean age of 7 years for epilepsy with NCC. [20] The youngest age reported in other comparable series were 3 years, by Puri et al., [16] 2 years by Baranwal et al, [17] 1.5 years by Singhi et al., [21] 5 years by Thakur et al. [22] Statistically significant association was found between age of onset and etiology of epileptic seizure (P value 0.02).

Generalized seizure was noted in majority of the patients (86.3% in the 51 cases of idiopathic epilepsy). This was also reported in other studies also. [3]

In this study out of 47 cases of NCC, 61.7% cases presented with partial seizure and remaining 38.3% had generalized seizures. These findings corroborate with that of Kalra et al., [20] who also found partial seizure as the commonest (65.8%) presentation of childhood NCC. Although some series had reported generalized seizure to be the commonest seizure type in patients with NCC. [23, 24]

In our present study, etiology and type of seizure were found to be strongly associated variables (P value 0.000). Also 46% of patient had recurrence of seizure after start of AED, mostly within first 6 months of starting therapy.

Study revealed that mothers of 50% of children with epilepsy were illiterate. Majority of the patients were from low income group (71%) and no cases in this study were from family with high monthly income i.e. more than 20,000 per month. This could be because in Govt. hospital majority of patients come from low income group. Further majority of the patients resided in urban area and 39% had their residence in J-J Cluster. Studies have shown that people from socio economically deprived backgrounds in developed countries are more likely to develop epilepsy. [25] Also, in developing countries majority of the patients with epilepsy belong to low socio-economic status. [2, 3]

Main health care facility availed by these children and their parents was general practitioner (44%). Significant number of parents (17%) took medicines from chemist shops, quacks, ayurvedic physicians etc.

CONCLUSIONS

Significant association between the type of seizure and the etiology was observed. Further statistically significant association was found between age of onset and etiology of epilepsy (P value 0.02) with age of onset was higher in epilepsy with NCC as compared to idiopathic epilepsy. GTCS and partial type seizures were the commonest in idiopathic and symptomatic (NCC as cause) epilepsy respectively. Majority of patients were from socio-economically deprived group with 71% come from low income group.

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How to cite this article: Kaushal GP, Popli V, Dutta M. Clinico-etiological and socio-economic profile of children (1-12 years of age) with epilepsy. International Journal of Research and Review. 2018; 5(12):243-248.

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