Original Research Article

Study of different variable and outcome in early and late onset childhood epilepsy

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Abstract

Background: Epilepsy is a chronic neurological disorder outcome of childhood epilepsy differs among early onset (onset before one year) and late onset (onset after one year) childhood epilepsy. There is a paucity of data regarding intractable epilepsy in India, especially in children. Early identification of clinical predictors of intractable epilepsy according to age of onset of seizures would help in counseling patients and their families, selecting patients for intensive investigations and treatment with recently approved treatment as earliest and also to consider surgical and other non surgical treatments. This study was done to observe the variable of outcome of early and late onset childhood epilepsies. **Methods:** Children with epilepsy between age 1mths to 12yrs attending to the epilepsy clinic at Departments of Paediatrics government medical college, Aurangabad were included in this study. Age, sex, family history of epilepsy, age of onset and the underlying illness were recorded for all cases, as well as details of the seizure history, duration, frequency, semiology, past history of seizures and drug history, birth history, developmental milestones recorded from all participants. Detail general examination, anthropometry, neurological examination and examination of co-morbid conditions conducted meticulously. They were divided into early onset group (onset of seizures before one year) and late onset group (onset of seizures after one year). Neuroimaging and EEG done in all cases. Blood samples were collected for complete blood count, liver function test and renal function test from all participants. All participants were following up regularly for clinical examination at 4 weekly intervals and blood parameters at 3 monthly intervals. Antiepileptic drugs were given to all epileptic children by the supervision of paediatrician. Polytherapy was given when monotherapy failed. They were asked to follow up in between if any new neurological symptoms, seizures and other new symptoms develop in participants the two group were observed for period of 2 year January 2016 to January 2018. **Results:** 234 patients were analyzed. Out of them 92 patients had early onset epilepsy and the rest 142 had late onset epilepsy. In early onset group 66.3% were males and 33.7%were females, while in late onset group males 55.6%andfemales were 44.4% Duration of epilepsy at follow up were same in both groups. generalised mode of onset were commonest in both groups 58. 6 % and 78. 8% in early and late onset groups respectively spasms as a mode of onset were seen in early onset group only. Status epilepticus at first presentation were almost same in both groups. Developmental delay intellectual disability and microcephaly were seen commonly in early onset group as compared to late onset group. Family history of epilepsy commonly observed in late onset group i.e. 23.9 %.Perinatal history of encephalopathy where more commonly observed in early onset group i.e. 63%. EEG abnormalities at the time of presentation were commonly recorded in early onset group Etiological MRI findings were observed in two groups which showed following observations. Hypoxic ischemic encephalopathy were commonest etiological MRI findings in early onset group while post encephalitis sequele were commonest etiological finding in late onset group. Congenital anomalies of neuronal migration and brain anomalies where commonly observed in early onset group. MRI finding suggestive of tuberous sclerosis where observed in early onset group only while neurocysticercosis and hippocampal abnormality observed in late onset group. Mesial temporal sclerosis were observed in late onset group exclusively. **Conclusions:** In this study Developmental delay intellectual disability and microcephaly were seen commonly in early onset group. Congenital anomalies of neuronal migration and brain anomalies where commonly observed in early onset group. Complete remission were more commonly observed in late onset group as compared to early onset group. Intractable outcome were more commonly observed in early onset group

Key Words: Early onset epilepsy, late onset epilepsy, outcome of childhood epilepsy.

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Received Date: 12/08/2018 Revised Date: 20/09/2018 Accepted Date: 03/10/2018
DOI: https://doi.org/10.26611/1014816

How to cite this article: Amol Suryavanshi, Shilpa Pawar, Smita Mundada. Study of different variable and outcome in early and late onset childhood epilepsy. *MedPulse International Journal of Pediatrics.* October 2018; 8(1): 25-29. http://medpulse.in/Pediatrics/index.php

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Accessed Date: 10 October 2018

INTRODUCTION

Epilepsy is a chronic neurological disorder characterized by a recurrent tendency to have spontaneous, intermittent, abnormal electrical activity in a part of the brain, which manifests as seizures, and diagnosed as the result of a patient having a second unprovoked seizure, with at least 24 hours between the first and second seizure. This definition regards an episode of status epilepticus (a seizure lasting more than 30 minutes or repeated seizures without intervening periods of regained function or consciousness) as a single seizure[8] However, the definition of epilepsy as a tendency to have recurrent seizures excludes seizures that are provoked by a distinct and immediate preceding cause e.g. an acute systemic or metabolic imbalance, drugs or toxins, or a recent cerebral damage from stroke, trauma or infection. Seizures occurring in children between 6 months and 6 years only within the context of a febrile illness without the evidence of intracranial etiology (febrile seizures) are also excluded, as are seizures occurring only within the neonatal period[8,9] The World Health Organisation estimates the point prevalence of active epilepsy as generally 4 to 10 per 1,000 people, and in developing countries from 6 to 10 per 1,000. It is also estimated that at least 50 million people in the world have epilepsy as 43.7 million people were reported to have epilepsy from 108 countries covering 85.4% of the world in a WHO survey.[10,11] The mean number of people with epilepsy per 1000 population is 8.93. This varies from 7.99 in high-income countries to 9.50 in low-income countries. (3) However, the incidence of epilepsy in developing countries is about twice that in developed countries, and the WHO estimates that about 80% of the world's epilepsy patients are in developing countries.[10] the incidence rate of epilepsy has a bimodal pattern in relation to age: it is high in the pediatric population (about half of all epilepsy cases are diagnosed in childhood or adolescence), decreasing through adulthood until approximate age 60, when the incidence again begins to increase.[13] With the onset of epilepsy, a chronic disorder, being common in childhood and adolescence, and due to the burden of experiencing unpredictable paroxysmal seizure events and its psychosocial implications, epilepsy contributes about 1% of the global burden of disease.[11] Predictors of outcome of childhood epilepsy differs among early onset (onset before one year) and late onset (onset after one year) childhood epillepsy. There is a paucity of data regarding intractable epilepsy in India, especially in children. Early identification of clinical predictors of intractable epilepsy according to age of onset of seizures would help in counseling patients and their families, selecting patients for intensive investigations and treatment with recently approved treatment as earliest and also to consider surgical and other non surgical treatments. This study was done to observe the variable of outcome of early and late onset childhood epilepsies

MATERIAL AND METHODS

Children with epilepsy between age 1mths to 12yrs attending to the epilepsy clinic at Departments of Paediatrics government medical college, Aurangabad were included in this study. Age, sex, family history of epilepsy, age of onset and the underlying illness were recorded for all cases, as well as details of the seizure history, duration, frequency, semiology, past history of seizures and drug history, birth history, developmental milestones recorded from all participants. Detail general examination, anthropometry, neurological examination and examination of co-morbid conditions conducted meticulously. They were divided into early onset group (onset of seizures before one year) and late onset group (onset of seizures after one year).Neuroimaging and EEG done in all cases. Blood samples were collected for complete blood count, liver function test and renal function test from all participants. All participants were following up regularly for clinical examination at 4 weekly intervals and blood parameters at 3 monthly intervals. Antiepileptic drugs were given to all epileptic children by the supervision of paediatrician. Polytherapy was given when monotherapy failed. They were asked to follow up in between if any new neurological symptoms, seizures and other new symptoms develop in participants the two group were observed for period of 2 year January 2016 to January 2018.

RESULTS

234 patients were analyzed. Out of them 92 patients had early onset epilepsy and the rest 142 had late onset epilepsy Distribution of sex in early and late onset of seizure groups (n=234).

Table 1:

Sex	Early onset group(n=92)	Late onset group(n=142)	Total
Male	61(66.3)	79(55.6)	140
Female	31(33.7)	63(44.4)	94
Total	**92**	**142**	**234**

In early onset group 66.3% were males and 33.7%were females, while in late onset group males 55.6%and females were 44.4%(x^2=2.220;df=1;p=0.1363)

Table 2:

Variable examined	Early onset epilepsy (n=92)	Later onset epilepsy (n=142)	P value (two tailed)
Duration of epilepsy at last follow up (months)	11 months (average)	15months (average)	
Focal mode of onset	14(15.2)	13(9.1)	P=0.2155
Generalized mode of onset	54(58.6)	112(78.8)	P=0.0003
Focal and generalized mode of onset	21(22.8)	17(11.9)	P=0.0309
Spasms mode of onset	3(3.2)	00(0)	P=0.0596
Status epilepticus at presentation	56(60.8)	83(58.4)	P=0.7855
Developmentaldelay/ Intellectual disability	66(71.7)	21(14.7)	P=0.0001
Microcephaly	61(66.3)	12(8.4)	P=0.0001
Family history of epilepsy	09(9.7)	34(23.9)	P=0.0059
Perinatal history of encephalopathy	58(63)	49(34.5)	P=0.0001
EEG abnormalities at prestation	78(84.7)	88(61.7)	P=0.0002

Duration of epilepsy at follow up were same in both groups. generalised mode of onset were commonest in both groups 58.6% and 78.8% in early and late onset groups respectively spasms as a mode of onset were seen in early onset group only. Status epilepticus at first presentation were almost same in both groups. Developmental delay intellectual disability and microcephaly were seen commonly in early onset group as compared to late onset group (p=0.0001). Family history of epilepsy commonly observed in late onset group i.e. 23.9% (P=0.0059). Perinatal history of encephalopathy where more commonly observed in early onset group i.e. 63% (P=0.0001). EEG abnormalities at the time of presentation were commonly recorded in early onset group (P=0.0002)

Table 3:

MRI findings in epilepsy	Early onset epilepsy (n=92)	Later onset epilepsy (n=142)
PVL	11(11.9)	08(5.6)
HIE	22(23.9)	12(8.4)
Post encephalitis sequels	07(7.6)	40(28.1)
Post meningitis sequale	04(4.3)	02(1.4)
Congenital Anomalies		
Focal cortical dysplasia	00	01
Agyria	03(3.2)	00
Pachygyria	01	00
Lissencepaly	01	00
Stroke	00	01
MTS(mesial temporal sclerosis)	00	03(2.1)
Hippocampal abnormality	00	01
Neurofibromatosis	00	01
Ring enhancing lesion(ncc)	00	02(1.4)
Cerebral or cortical atrophy	O8(8.6)	05(3.5)
Tubers sclerosis	02	00
Jouberts syndrome	01	00
Hydrocephalus	02	03
Arnold chairi malformation	01	
Arachanoid cyst	00	01
Metachromatic leucodystrophy	01	00
Total	**64**	**79**

Etiological MRI findings were observed in two groups which showed following observations. Hypoxic ischemic encephalopathy were commonest etiological MRI findings in early onset group while post encephalitis sequele were commonest etiological finding in late onset group. Congenital anomalies of neuronal migration and brain anomalies where commonly observed in early onset group. MRI finding suggestive of tuberous sclerosis where observed in early onset group only while neurocysticercosis and hippocampal abnormality observed in late onset group. Mesial temporal sclerosis were observed in late onset group exclusively.

Table 4:

Varaiable	Early onset epilepsy (n=92)	Later onset epilepsy (n=142)	P value
Mortality	02 (metcromatic leucodystropry and spastic qudeiplgic cp)	00	P=0.1576

Only two patient died during study were belong to early onset group

Table 5:

Outcome	Early onset epilepsy (n=92)	Later onset epilepsy (n=142)
Seizure free for> 6 month	42(45.6)	79(55.6)
Seizure free for >1 year	26(28.2)	37(26)
Complete remission (seizure free for 2 years)	06(6.5)	22(15.4)
Intractable outcome	18(19.5)	04(2.8)

Complete remission were more commonly observed in late onset group i.e.15.4% as compared to early onset group. Intractable outcome were more commonly observed in early onset group i.e. 8.6%. Seizure free duration more than 6 month were 55. 6% in late onset group and 45.6% in early onset group (x^2=21.5885; P=0.000079;df=3)

Table 6:

Antiepileptic drugs	Early onset epilepsy (n=92)	Later onset epilepsy (n=142)
Monotherapy (single AED during course)	56(60.8)	91(64)
2 or > AED at a time during course	12(13)	08(5.6)
2 AED a during course but not at a time	24(26)	43(30.2)

Most of the patient from both group were on monotherapy 60.8%in early onset and 64%in late onset group. drug resistance were observed more i.e. 13% in early onset group as compered to 5.6%in late onset group. 26% patient in early onset and 30.2%in late onset group were on two drugs during course but not at a time (x^2=4.0212; P=0.133906;df=2)

DISCUSSION

Developmental delay intellectual disability and microcephaly were seen commonly in early onset group as compared to late onset group (p=0.0001) It was found as an independent predictor of intractable epilepsy. Chawla *et al*[1] found 58% of earlyonset group compared to 2% of well-controlled group had microcephaly (P<0.001). Berg *et al*[2]. found 23.7% cases of intractable group compared to only 3.1% of well controlled group had microcephaly (P<0.001).EEG abnormalities at the time of presentation were commonly recorded in early onset group(P=0.0002) abnormality is significantly associated with unfavourable outcome (P=0.046). Selina *et al*[3]. Drug resistance were observed more i.e. 13% in early onset group as compered to 5.6%in late onset group. 26% patient in early onset and 30.2%in late onset group were on two drugs during course but not at a time(x^2=4.0212; P=0.133906;df=2) Similar result was found by Lu Xia *et al*l that late age at seizure onset of epilepsy had favourable outcome [4] Early age of onset was found asan independent predictor of unfavourable outcome or intractable epilepsy (P<0.001). Chawla *et al*[1] While Datta and Wirrell[5] found that 38% of the 40 patients with an onset of seizure in the first year of life had uncontrolled seizures at follow-up. Mortality in pediatric epilepsy is higher in children with early onset epilepsy. Children with epilepsy onset in the first year of life were over six times more likely to die than children with later onset epilepsy In our study Only two patient died during study were belong to early onset group similarly Brian D. Moseley *et al*[6] found that Early onset epilepsy is associated with increased mortality. Etiological MRI findings were observed in two groups which showed following observations. Hypoxic ischemic encephalopathy were commonest etiological MRI findings in early onset Labate and colleagues[7] who found abnormal MRIs in 38.6% of patients 10–83 years of age

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Source of Support: None Declared
Conflict of Interest: None Declared