

Short term outcome of epileptic Seizure in children attending at Paediatric Neuroscience Department of Dhaka Shishu Hospital

H R Quaderi¹, S Sarker², S I Kanta³, B H N Yasmeen⁴

Abstract

Background : The optimal response to antiepileptic treatment is the control of seizures. In different studies, it has been shown that childhood epilepsy presents with a variable course, and approximately one-third of epilepsy experience alternating relapse and remission. Some of them do not become seizure-free, despite adequate treatment.

Objectives : This study aimed to see the short-term outcome of seizures in children with epilepsy (whether the seizure is controlled or not) and to correlate them with different predictors like socio-demographic factors, associated comorbidities, and adherence with antiepileptic drugs.

Methods : This retrospective observational study was conducted in an Epilepsy Clinic of Paediatric Neuroscience Department of Dhaka Shishu Hospital (DSH) over a period of 3 years from January 2013 to December 2015. During this period 1-year follow-up record of each patient was analyzed. Information on bio demographic data, clinical and developmental assessment done by a multidisciplinary team was analyzed.

Results : A total of 100 children who had epilepsy were included in this study. Unfavorable outcome (uncontrolled seizure) was found in children < 5 years of age, children from the rural area, and those whose parents education were below secondary level (*p* values were 0.05, 0.03 and 0.04 respectively). Also, the unfavorable outcome was found in children who had H/O perinatal asphyxia (PNA), motor problem, and feeding problem (*p*-value=0.5, 0.002, 0.05 respectively). After 1 year of regular follow up milestone of development was improved in more than one 1domain in 51 children. But there was no improvement found or their condition remained unchanged in 49 children.

DOI: <https://doi.org/10.3329/nimcj.v11i1.50734>

Northern International Medical College Journal Vol. 11 No. 1 July 2019, Page 411-414

¹Dr. Humaira Rafiq Quaderi
MBBS, DCH, FCPS (paed)
Assistant Professor
Dept. of Pediatric Neuroscience
Bangladesh Institute of Child
Health (BICH) and Dhaka Shishu
Hospital

²Dr. Shaoli Sarker
MBBS, FCPS (paed)
Assistant Professor
Dept. of Pediatric Neuroscience
BICH and Dhaka Shishu Hospital

³Dr. Shayla Imam Kanta
MBBS, MCPS, MD (paed)
Assistant Professor
Dept. of Pediatric Neuroscience
Bangladesh Institute of Child
BICH and Dhaka Shishu Hospital

⁴Prof. Dr. B H Nazma Yasmeen
Professor and Head
Dept. of Paediatrics
Northern International Medical
College (NIMC), Dhaka

Correspondence
Dr. Humaira Rafiq Quaderi
MBBS, DCH, FCPS (paed)
Assistant Professor
Paediatric Neuroscience Department
Bangladesh Institute of Child Health
(BICH) and Dhaka Shishu Hospital
Email : dr.humaira25th@gmail.com

Background

One of the common causes of childhood morbidities is epilepsy and about 80% of children with epilepsies are in developing countries.¹ Epilepsy is one of a major public health issue worldwide due to its medical, social, cultural and economic consequences.² It carries a significant burden not only due to the seizures, but also to the comorbidities, the disabilities, and the superstition associated with the disease.³ The goal of treatment in patients with epileptic seizures is to achieve control without adverse effects. Childhood epilepsy present with variable course, and near about one-third of epilepsy experience alternating periods of relapse and remission.⁴ Several studies showed

that most of the children with epilepsy achieved permanent remission from seizures.^{5,6} On the other hand some studies also showed that despite adequate treatment they did not become seizure free.^{6,7} Different socioeconomic factors, associated comorbidities and non-adherence to medication are associated with poor seizure control in children shown in different studies.^{8,9} Children who belongs to low socioeconomic status have a higher baseline risk of epilepsy.¹⁰ A study done in Nigeria where they found risk of epilepsy was twofold more in rural area compared to urban.¹¹ Children who have epilepsy, mostly suffer with poor health outcomes and they have high risk of multiple serious comorbidities.⁸ However these

comorbidities will further add to the disease burden on their families and also impact their quality of life and long-term outcome.^{12,13} Therefore Early recognition and management of the comorbidities of epilepsy can lead to a better quality of life and better outcomes.¹⁴

In clinical practice, it would be very much helpful if the physician could predict the clinical course of a child’s epilepsy and identify the risk factors of poor seizure control within a short period of time after diagnosis. Then it would be easy to plan the treatment appropriately and counsel the parents accordingly. But till now a very few studies have done on the outcome of epileptic seizures in children in Bangladesh. We have very limited information regarding this matter. Therefore, in this study we tried to identify early predictive factors of outcome of epilepsy in children.

Material and Methods

This retrospective study was conducted at the outpatient services of the Paediatric Neuroscience Department of Dhaka Shishu Hospital (DSH) over a period of 3 years from January 2013 to December 2015. Total 100 patients from 6 months to 15 years of age were purposively selected for the study, if they had 2 or more unprovoked seizures occur >24 hour apart.¹⁵ Children who had febrile seizure and children who were dropped out from the follow up visits (first or subsequent) up to 1 year were excluded from the study.

In this study children who were seizure free for the last 6 months or more were defined as having controlled seizures and patients who had seizures in previous 6 months were labelled as poorly controlled seizures.¹⁶

All the study patients were divided in to 2 groups depending on seizure control. Controlled seizure cases were classified as favourable outcome group and uncontrolled seizure cases were classified as unfavourable outcome group.

For the study purpose adherence with antiepileptic drug (AED) was defined as not missing a dose and non-adherence with antiepileptic drug - as missing a dose or stopping treatment in the last 6 months.

Information of biodemographic data, perinatal history, clinical and developmental assessment done by a multidisciplinary team were analysed. Sociodemographic profile, clinical profile and non adherence were correlate between the two groups.

Socio economic status was classified as lower income group if the monthly earnings of the parents were between 5000-20000 taka, and higher income group if it was between 20,000-60,000 taka.

To assess the development of the child Rapid neuro developmental assessment (RNDA)¹⁷ applied by the multidisciplinary team and assessment result was analysed. For the study purpose according to Rapid Neuro developmental

Assessment (RNDA), children who had deficit in 1 or >1 domain were classified as impairment and children who had no deficit in any domain were classified as normal.

Before going for the study, approval from the Ethical Review Committee of Dhaka Shishu Hospital and Bangladesh Institute of Child Health were obtained. Number, percentage, were described in frequency and distribution. Association of outcome with different variables were obtained by chi-squared. Data was analysed in SPSS version 21.

Result

Among 100 children who had epilepsy, male was found 59(59%) and female were 41(41%). Male female ratio was 1.3:1.(Fig-1).

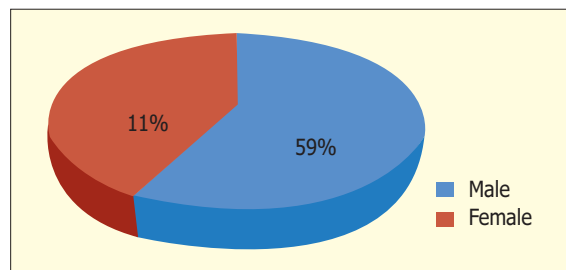


Figure 1 : Sex distribution (n=100)

Favourable outcome (controlled seizure) was found in 40 patient (40%) and unfavourable outcome (uncontrolled seizure) was found in 60 patient(60%).When we correlate the effect of socio demographic status on seizure outcome, unfavourable outcome was found in children who had <5 years of age, who came from rural area and those whose parents were less educated(below secondary level). (Table I).

Table I : Demographic profile Vs seizure outcome

Variables	Seizure Outcome		P value
	Favourable outcome (controlled seizure) N= 40	Unfavourable outcome (uncontrolled seizure) N= 60	
Age			
6mo to <5year	18	40	.05
5-15yr	22	20	
Sex			
Male	22	37	.4
Female	18	23	
Residence			
Urban	29	30	.03
Rural	11	30	
Income			
Higher income	8	12	.6
Lower income	32	48	
Parents Education			
<secondary	15	34	.04
>secondary	25	26	

We found 75(75%) children had history of PNA and most of these children had unfavourable outcome. (p value = 0.05) (Table-II).

In this study different comorbidities were found in children with epilepsy and they were-motor (54%), cognition (58%), vision (59%), hearing (37%), speech (43%), feeding problem (26%),behavioural problem (25%). Every child had more than 1 comorbidity. (Table II).

Among them unfavourable outcome was found in children who had motor problem and feeding problem and they were found statistically significant (Table II). Outcome was unfavourable in children who had non adherence with antiepileptic drugs (n=52) and it was statistically significant. (Table II).

Variables	Number of patients (n=100)	Seizure outcome		P value
		Favourable outcome (controlled seizure) n=40	Unfavourable outcome (uncontrolled seizure) n=60	
H/O Birth Asphyxia				
Present	75	26	49	.05
Absent	35	14	11	
Motor				
Normal	46	26	20	.002
Impaired	54	14	40	
Cognition				
Normal	42	19	23	.2
Impaired	58	21	37	
Vision				
Normal	41	13	28	.1
Impaired	59	27	32	
Hearing				
Normal	83	31	52	.3
Impaired	37	6	31	
Feeding problem				
No	74	33	41	.05
Yes	26	7	19	
Speech				
Normal	57	19	38	.08
Impaired	43	21	22	
Behaviour				
Normal	75	29	46	.4
Impaired	25	11	14	
Non adherence				
Yes	52	15	37	.04
No	48	25	23	

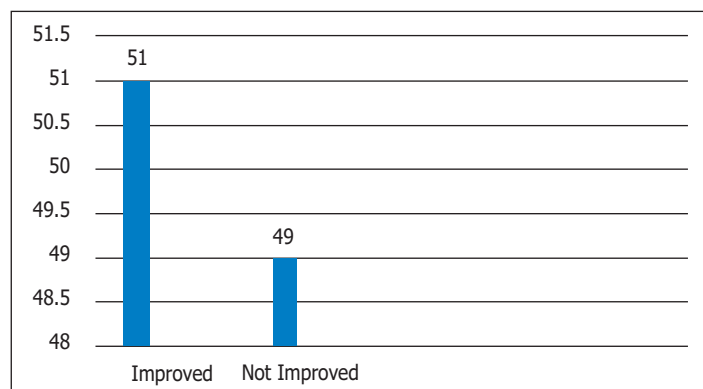


Fig 2 : Outcome of milestone of development after 1 year

After 1 year, among the study patient, milestone of development in more than 1 domain was improved in 51 children compared to

49 children, who had no improvement or their condition remain unchanged. (Fig 2).

Discussion

Of the 100 children, male was 59(59%) and female was 41(41%) and most of the children were less than 5 years of age. Male was predominance in several other studies done in other developing countries. A study done in Bangladesh in 2003 where Banu et al showed that among 150 children who had epilepsy, the median age at presentation was 3 years and male was 68.9% and 65.6% came from urban area.¹⁸ In our study out of 100 patients, 40% had Favourable outcome (controlled seizure), whereas 60% had unfavourable outcome (uncontrolled seizure). In a recent population based it was found that, 30% of affected children had uncontrolled epilepsy, whereas 59% achieved ≥ 1 year of seizure free period.¹⁹ In some other studies it was shown that between 61%and 71% of children with epilepsy achieve remission, whereas 7% to 20% have uncontrolled or drug-resistant epilepsy.^{5,7} In our study uncontrolled seizure were more than those study. The reason behind this might be, the study was done in a tertiary care hospital and as it is a referral hospital most of the children referred from different part of the country who were complicated and severe. Therefore, this study represents the severe spectrum of the disease.

When we tried to correlate the seizure outcome with socio demographic profile we found unfavourable outcome in children who had <5 years of age, who came from rural area and those whose parents did not pass secondary level of education. A study done in India, showed that 40 to 90% children of rural areas did not take treatment properly in compared to 22–50% in suburban and urban populations.^{20,21} Some author did not find any association between socio demographic characteristics and childhood seizure outcome.¹⁹

Early onset of epilepsy is associated with worse outcomes showed in many studies similar to our study. In a longitudinal study of childhood epilepsy with onset before age 36 months, it was found that 35% did not become seizure free.²²

In this study we found that 75% had a history of perinatal asphyxia and they had significant unfavourable outcome. In developing countries, environmental risk factors are in abundance. Perinatal brain insults constitute a major challenge there. A study from Kenya reported a strong association between convulsive epilepsy and previous perinatal injury (odds ratio (OR)¼ 4.1, 2.1–8.1; $p < 0.0001$). Adverse perinatal events were also strongly associated with active epilepsy (OR¼5.7, 2.6–12.7; $p < 0.0001$).²³

It has been shown that, 40% of children with epilepsy have one or more comorbidities like cognitive delays, speech/language disabilities, and other specific learning disabilities.²⁴ In this study

we also found multiple comorbidities along with epilepsy, like motor, cognition, vision, hearing, speech and behaviour problem and feeding difficulties. Among them significant unfavourable outcome was found in children who had motor impairment. A study done in Bangladesh had similar result of our study, where it was found that high rates of seizures, multiple seizure types were associated with motor disability, and poor cognition. Therefore, motor disability, and poor cognition were found to be a significant predictor of poor seizure remission.¹⁸ A combination of epilepsy-related features and functional disabilities have been identified as predictors of seizure outcomes in several studies of developed and developing countries.^{25,26}

Another important comorbidity that causes unfavourable seizure outcome were feeding problem. Our study children have various problems like dystonia, spasticity gastrointestinal disorders, oral motor dysfunction, constipation, and gastroesophageal reflux leading to feeding problem and difficulties in giving antiepileptic drugs. As a consequence, they had poor seizure control. Several studies showed that feeding difficulties and malnutrition are common in these group of children as they had anorexia, chewing and swallowing difficulties or vomiting.²⁷

We found unfavourable outcome in children who were not-adherence to medication ($p=0.04$). This is similar to several published literature where patients who were non adherent to their medications had poor seizure control as compared with patients who were adherent to their AEDs.^{28,29}

There were several limitations in our study, which should be taken into consideration. Retrospective information was analysed in a tertiary care centre where families tend to bring only their severely impaired or disabled children. Therefore, we found each child had more than one comorbidity along with epilepsy. Probably this is the reason for more adverse outcome in most of the cases in this study. Another important limitation of this study was that we were only able to evaluate short-term outcome of epilepsy.

Conclusion

In this study we found several socio demographic factors, associated comorbidities and poor adherence with treatment are important factors in predicting unfavourable outcome of children with epilepsy. In this regard large scale multicentre studies are required for further evaluation.

We also found that most of the children with unfavourable outcome had history of perinatal asphyxia which is alarming. This indicate a need for further investigation to find out the underlying causes of perinatal asphyxia, what appropriate measures should be taken in the community to reduce perinatal insults, to identify the new born infant with high risk and to identify early intracranial infections and other preventable and treatable causes of secondary epilepsies. More studies are required for further evaluation of all these factors.

References

- Shorvon SD, Farmer PJ. Epilepsy in developing countries: a review of epidemiological, socio cultural and treatment aspects. *Epilepsia* 1988;29(1):36-54.
- Newton CR, Kariuki SM. Status epilepticus in sub-Saharan Africa: New findings. *Epilepsia*. 2013 Sep; 54 Suppl 6(1):50-3.
- Gaitatzis A, Carroll K, Majeed A, W Sander J. The epidemiology of the comorbidity of epilepsy in the general population. *Epilepsia*. 2004 Dec; 45(12):1613-22.
- Arts W, Brouwer O, Peters A, Stroink H, Peeters E, Schmitz P, et al. Course and prognosis of childhood epilepsy: 5 year follow-up of the Dutch study of epilepsy in childhood. *Brain* 2004;127(8):1774-84
- Sillanpää M, Antinen A, Rinne JO, Joutsa J, Sonninen P, Matti E, et. Childhood-onset epilepsy five decades later. A prospective population-based cohort study. *Epilepsia* 2015;56(11):1774-1783
- Berg AT, Rychlik K, Levy SR, Testa FM. Complete remission of childhood-onset epilepsy: stability and prediction over two decades. *Brain* 2014;137(12):3213-3222
- Sillanpää M, Schmidt D. Early seizure frequency and aetiology predict long-term medical outcome in childhood-onset epilepsy *Brain*. 2009;132(4):989-98
- Keezer MR, Sisodiya SM, Sander JW. Comorbidities of epilepsy: current concepts and future perspectives. *Lancet Neurol* 2016; 15 (1) :106-15
- Jones RM, Butler JA, Thomas VA, Peveler RC, Prevett M. Adherence to treatment in patients with epilepsy: associations with seizure control and illness beliefs. *Seizure* 2006 Oct; 15(7):504-8.
- Russ SA, Larson K, Halfon N. A national profile of childhood epilepsy and seizure disorder. *Pediatrics* 2012;129(2):256-64
- Ogunrin OA, Obiabo OY, Obehigie E. Risk factors for epilepsy in Nigerians-a cross-sectional case-control study. *Acta Neurol Scand*. 2014 Feb;129(2):109-13.
- Gaitatzis A, Sisodiya SM, Sander JW. The somatic comorbidity of epilepsy: a weighty but often unrecognized burden. *Epilepsia* 2012;53(8):1282-1293
- Wei SH, Lee WT. Comorbidity of childhood epilepsy *J Formos Med Assoc* 2015; 114(11):1031-1038
- Sirven JI. Management of Epilepsy Comorbidities. *Contin Lifelong Learn Neurol*. 2016;22(1):191.
- Fisher RS, Acevedo C, Arzimanoglou A, Bogacz A I. A practical clinical definition of epilepsy. *Epilepsia* 2014; 55(4):475-482.
- Zafar A, Shahid R, Nazish S, Aljaafari D, Alkhamis FA, Alsalman S, et al. Nonadherence to Antiepileptic Medications: Still a Major Issue to be Addressed in the Management of Epilepsy. *J Neurosci Rural Pract* 2019;10(1):106-12.
- Khan NZ, Muslima H, Shilpi AB, Begum D. Validation of rapid neuro developmental assessment for 2- to 5-year-old children in Bangladesh. *Pediatrics*. 2013;131(2):486-94.
- Banu HS, Khan NZ, Hossain M, Jahan A. Profile of childhood epilepsy in Bangladesh. *Developmental Medicine & Child Neurology* 2003, 45: 477-82.
- Aaberg KM, Bakken IJ, Lossius MI, Lund S, Tallur K, Stoltenberg C, et al. Short term Seizure Outcomes in Childhood Epilepsy. *Pediatrics* 2018;141(6):2017-4016
- Jennum P, Christensen J, Ibsen R, Kjellberg J. Long-term socioeconomic consequences and health care costs of childhood and adolescent-onset epilepsy. *Epilepsia* 2016;57:1078-85.
- Sureka RK, Sureka R. Prevalence of epilepsy in rural Rajasthan a door-to-door survey. *J Assoc Phys India* 2007;55:741-42
- Wirrell E, Wong-Kisiel L, Mandrekar J, Nickels K. Predictors and course of medically intractable epilepsy in young children presenting before 36 months of age: a retrospective, population-based study. *Epilepsia* 2012;53(9): 1563-69
- Edwards T, Scott AG, Munyoki G, Odera V. Active convulsive epilepsy in a rural district of Kenya: a study of prevalence and possible risk factors. *Lancet Neuro* 2008; 17:50-56.
- Lhatoo SD, Sander JWAS. The epidemiology of epilepsy and learning disability. *Epilepsia* 2001;42(1):6-9.
- Camfield C, Camfield P, Gordon K, Smith B, Dooley J. Outcome of childhood epilepsy: a population based study with a simple predictive screening system for those treated with medication. *J Pediatr* 1993; 122: 861-8.
- Sillanpää M. Remission of seizures and predictors of intractability in long-term follow-up. *Epilepsia* 1993; 14: 930-6
- Trier E, Thomas AG. Feeding the disabled child. *Nutrition* 1998; 14(10):801-805
- Gabr WM, Shams ME. Adherence to medication among outpatient adolescents with epilepsy. *Saudi Pharm J* 2015; 23:33-40
- Zafar A, Shahid R, Nazish S, Aljaafari D, Alkhamis FA, Alsalman S, et al. Nonadherence to Antiepileptic Medications: Still a Major Issue to be Addressed in the Management of Epilepsy. *J Neurosci Rural Pract* 2019;10(1): 106-12.