ORIGINAL ARTICLE

Sociodemographic Profile and Comorbidities of Children with Epilepsy Attending in Child Development Centre (CDC) of Dhaka Shishu Hospital

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Abstract

Background: *Epilepsy is the most common conditions encountered in most paediatric neurology clinics in many parts of the developing world. It is important to understand the sociodemographic profile of children with epilepsy and also to recognize the comorbidities associated with themfor planning management and developing wider services within the country.*

Objectives: *The present study aimed at understanding the socio-demographic profileand comorbidities of children with epilepsy, seeking treatment at a tertiary care hospital in Bangladesh.*

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 analysed. Information on biodemographic data, clinical and developmental assesment made by a multidysciplinary team was analysed.*

Results: *A total 120 children who had epilepsy were included in this study.The median age at presentation was 2.4 years. Male were 69(58%) and female were 51(42%). Most of the children came from rural area (58%, n=70). Middle income families were over presented (58%). 82% had a history of perinatal asphyxia. Motor, speech impairment and malnutrition were found more who had H/O perinatal asphyxia (P value 0.002,0.005 and 0.03 respectively.*

Conclusion:*In conclusion, epilepsy is one of the commonest neurological morbidity in our environment. This study has provided important information about sociodemographic profile and associated comorbidities in children with epilepsy. This information can be used as a guideline for developing services for children with epilepsy and in prevention of some detectable causes in our countries like birth asphyxia which is found large number in this study.*

Kew words: *Epilepsy, sociodemographic profile, CDC.*

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Introduction

Epilepsy is the most common childhood neurologic disorder, affecting 0.5-1.0% of children younger than 16 years.[1] Incidence and prevalence of epilepsy in children are higher in developing countries.[2,3] The median lifetime epilepsy prevalence for developed countries is 5.8 per 1000, whereas in rural areas of developing countries is 15.4 per 1000.[4] Another population based studies report a prevalence rate of Epilepsy among children to be 3.6 to 4.2 per 1000 in developed countries[5] and around double these rates in developing countries.[6-9] In Bangladesh epidemiological surveys confirm that seizure disorders are common, one study showing a prevalence rate of 68 out of every 1000 for 'any seizure history' and 9 out of every 1000 for 'any unprovoked seizure', in children aged 2 to 9 years.[10] The difference of prevalence and incidence among developed and developing countries is partly explained by some risk factors such as head trauma, CNS infections and perinatal injuries, which are more common in poor regions, particularly in rural areas.[11] Several other study performed in different developing countries showed that adverse perinatal events were strongly associated with epilepsy.[12,13] Adverse perinatal events were related to Delivery methods used, nutrition during pregnancy, sanitation, availability of midwives, and preference for home deliveries .[13] This adverse perinatal events can be prevented with better antenatal and perinatalcare.[14] Malnutrition is also associated with an increased risk of epilepsy. In one recent study in Benin, malnutrition was present in 22.1% of cases versus 9.2% of controls.[15] The incidence of epilepsy is clearly highest in the first year of life[16] and decreases throughout childhoodand adolescence. The cumulative incidence rate of epilepsy by age 15 years is around 0.8%.[17] Although there are some occasional reports of differences between males and females, these tend to be inconsistent. Prevalence ratestendto be slightly higher in boys thanin girls.[18] In India, recent studies report a differential distribution of epilepsy among various socio demographic and economic groups with higher rates reported for the male gender, rural population, and low socioeconomic status.[19] Epilepsy in children is associated with variable comorbidities. Population-based studies show that 70-76% of children with epilepsy have some types of disability or handicap affecting their daily life.[20,21]

Neurological comorbidities in children with epilepsy are variable, including motor, cognitive impairment, language impairment, vision and hearing. Comorbid disorders contribute to the disease burden experienced by patients and their families and influence their quality of life and long-term outcome.[22]

Various studies have explored the link between socio-demographic profile and access to expert health care and antiepileptic drug (AED) prescriptions in children with epilepsy.[23] Very little is known about childhood epilepsies in Bangladesh. This study was conducted within a tertiary care children's hospital in Dhaka city to provide baseline information on sociodemographic profile and comorbidities of children with epilepsy that will help in developing integrated services for this group.

Materials and Methods

This retrospective study was conducted at the outpatient services of the PaediatricNeuroscience Department in Dhaka ShishuHospital (DSH) over a period of 3 years from January 2013 to December 2015. DSH is the largest tertiary care paediatric teaching hospital in Bangladesh that provides care to the children from all over the country.The Child Development Center(CDC), is the outpatient division of Paediatric neuroscience department of Dhaka Shishu Hospital. Since 1992 it has provided, for the first time in the country, a comprehensive servicefor children with neurodevelopmental impairments and disabilities. The core team includes child health physicians, developmental therapist and psychologist. There is a weekly epilepsyclinic. A total of 120 children who had been seen consecutively inthe epilepsy clinic were retrospectively enrolled into the studyif they had two or more unprovoked seizures. The children who had febrile seizure were excluded from this study.Information on biodemographic data, perinatal history,clinical and developmental assesment made by a multi-dysciplinary team was analysed. Epilepsy is defined as At least two unprovoked (or reflex) seizures occurring >24 h apart.[24]

Socioeconomic status of families was defined as lower income if the monthly earnings were less than 5000 taka, middle income if it was between 5000-<20000 taka, and higher income if it was more than >20000-60000 taka.[25] To assess the development of

the child Rapid neurodevelopmental assessment (RNDA) was done.[26] Rapid Neurodevelopmental Assessment (RNDA) is an assessment tool designed to ascertain functional status, i.e., Neuro-developmental Impairments (NDIs), across multiple neurodevelopmental domains; such as motor, cognition, vision, hearing, speech with grades of severity for each domain determined, so that appropriate interventions can be planned, and prioritized, according to the child's ascertained NDI profile. Data was analysed in SPSS version 21.

Results

A total 120 children who had epilepsy were included in this study. Table I provides the socio-demographic profile of the study sample. The median age at presentation was 2.4 years (age range was <6month to 15 years.) Male were 69(58%) and female were 51(42%). Male female ratio was 1.3:1. Most of the children came from rural area (58%, n=70). Middle-and lower-income families were more which was 58%(n=70) and 26%(n=31) respectively. Most of the parents had completed their primary and secondary education (48% and 19% respectively). Among the study population, 82% had a history of perinatal asphyxia, defined as delayed cry (more than 15 minutes) after full delivery of the baby, with poor motor tone and change in skin colour, neonatal seizures were found in 5% of participants and neonatal jaundice was found in 8% cases (Table II). Regarding associated comorbidities, motor, cognition and speech impairment were more and they were 82%,81% and 71% respectively. Other comorbidities were vision, hearing, behavioural problem and malnutrition and they were 43%,31% and 23% respectively (Table III). When we correlate the comorbidities with birth asphyxia, significant correlation was found between birth asphyxia and motor, speech impairment and malnutrition (P value 0.002,0.005 and 0.03 respectively) (Table IV).

Table I
Sociodemographic profile of study patients (n=120)

Variables	Category	Frequency (n)	Percentage (%)
Age	<6month	30	25
	6-1 year	32	27
	>1yr-5yr	41	34
	5-<10yr	13	11
	>10yr-15yr	4	3
Sex	Male	69	58
	Female	51	42
Residence	Urban	50	42
	Rural	70	58
Income	Higher income	19	16
	Middle income	70	58
	Lower income	31	26
Education	Iliterate	11	9
	Primary	57	48
	Secondary	23	19
	Higher secondary	13	11
	Graduates	16	13

Table II
Birth problems of study patient (n=120)

Birth problems	Frequency (n)	Percentage (%)
Yes	114	95
Perinatal asphyxia	98	82
Neonatal convulsion	6	5
Neonatal Jaundice	10	8
No	6	5
Total	120	100

Table III
Comorbidities of study patient (n=120)

Parameter		Frequency (n)	Percentage (%)
Motor	Yes	97	81
	No	23	19
Cognition	Yes	98	82
	No	22	18
Speech	Yes	85	71
	No	35	29
Vision	Yes	52	43
	No	68	57
Hearing	Yes	37	31
	No	83	69
Behaviour	Yes	27	23
	No	93	77
Malnutrition	Yes	32	27
	No	88	73

Table IV
Correlation between comorbidities and birth asphyxia of study patients(n=120)

Comorbidities	Birth asphyxia		Total	p value
	Yes	No		
Motor impairment				
Yes	85(71%)	12(10%)	97(81%)	.002
No	13(11%)	10(8%)	23(19%)	
Cognitive Impairment				
Yes	80(67%)	18(15%)	98(82%)	.626
No	18(15%)	4(3%)	22(18%)	
Speech problem				
Yes	75(62%)	10(8%)	85(71%)	.005
No	23(30%)	12(10%)	35(29%)	
Vision impairment				
Yes	46(38%)	6(5%)	52(43%)	.07
No	52(44%)	16(13%)	68(57%)	
Hearing impairment				
Yes	33(28%)	4(3%)	37(31%)	.120
No	65(54%)	18(15%)	83(69%)	
Behavioural problem				
Yes	19(16%)	8(7%)	27(23%)	.07
No	79(66%)	14(11%)	93(77%)	
Feeding difficulties				
Yes	33(28%)	4(3%)	37(30%)	
No	65(54%)	18(15%)	83(70%)	.120
Malnutrition				
Yes	30(25%)	2	32(27%)	.03
No	68(57%)	20	88(73%)	

Discussion

Of the 120 children male was 58% and female was 42% and most of the children were within 5 years of age. Boys were over-represented in the study sample and this might be areflection of a gender bias. Boys with disabilities are more likely than girls with disabilities to be brought to services by their families.[27] Male was predominance in several other studies done in other developing countries. A study done in Nigeria in 2017 where Eyong et al found that among 107 children 79% were male and The age range 1-5 years had the highest number of children with epilepsy followed by those aged 6-10 years.[28] Another study done in Bangladesh in 2003 where Banu et al[29] 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. Though the study was city-based, rural families were over-represented (58%), as because 85% of the estimated 130 million population of Bangladesh live in rural areas (UNICEF 2001).[30] Although low-income families coming to general outpatients constitute over 60% of total attendance (unpublished hospital records), they comprised 26% in this present study.We found middle income families were over presented(58%) which is quitehigh than a study in Bangladesh where Banu et al found 37.1%.[29] But Rani A et al[31] in 2016 found most of the children diagnosed with seizure disorder were males and aged between 6 to 10 years and 43.3% came from urban area. Our finding isquite similar to those studies except that most of our patients were from rural area.In our study most of the patient came from middle income family (58%) and had completed their primary education level (48%).In a study Banu et al found Lower, middle, and higher income families were almost equally represented.[29] in this study 82% had a history of perinatal asphyxia. In developing societies, environmental risk factors are in abundance. Perinatal brain insults constitute a major challenge in these countries. Several studies have investigated this aspect. This findingis quiet high to a study where Banu et al and Eyonget al found 46.4% and 17.8% epilepsy patient had history of perinatal asphyxia.[28,29] One study from Kenya reported a strong association between convulsive epilepsy and previous head injury (odds ratio (OR)¼4.1, 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).[32] These large number of children having history of perinatal asphyxia is alarming. This indicate aneed for further investigation of underlying causes, and a need for measures within the community to reduce perinatal insults, to identify the new born infant at high risk, and to identify early intracranial infections and other preventable and treatable causes of secondary epilepsies.

In this study motor, cognition and speech impairment were more and they were 82%,81% and 71% respectively. Other comorbidities were vision, hearing, behavioural problem and malnutrition and they were 43%, 31% and 23% respectively. The children who had history of birth asphyxia had more motor, speech problem and malnourished (p value, 0.002, 0.005 and 0.03 respectively). Recently, one study performed in five LMIC of Africa (South Africa,Tanzania, Uganda, Kenya and Ghana) aimed to describe the clinical features,the causes and the consequences of active epilepsy in those regions. The main comorbidities were malnutrition, cognitive impairment and neurologic deficit.[33] A study done in Bangladesh where Banu et al showed 57%, children had associated nonconvulsive disability, among them 41% had major motor disability and 72.8% had poor cognition.[29] Several otherpopulation-based prevalence studiesof children with epilepsy reported that intellectual disability (full-scale intelligence quotient <70) was the most common comorbidity (30-40%).[34] The occurrence of speech disorders may be as high as 27.5% in children with epilepsy.[35] In this study we found 23% children had malnutrition. Malnutrition is also associated with an increased risk of epilepsy. In one recent study in Benin where Creping et al[15] in 2007 found 22.1% of cases had malnutrition versus 9.2% of controls (p<0.0006).

There were several limitations to the study, which should be taken into consideration. It is a single centre study.Retrospective information was analysed in a tertiary care centre where families tend to bringonly their severely impaired or disabled children, so we found every children had more than one comorbidities along with epilepsy· So the number of comorbidities were more in this study.

Conclusion

On the basis of records from an epilepsy clinic in a child development and neurology centre in Dhaka shishu hospital,this study has provided important

information about sociodemographic and associated comorbidities in children with epilepsy. This information can be used as a guideline for developing services for children with epilepsy as well as prevention of some detectable causes in countries like birth asphyxia which is found large number in this study.Our future plan is to follow up these patients and see their outcome and also to identify the challenges and difficulties in management that we are facing every day in our clinical practices.

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