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## Etiology and incidence of childhood seizure admitted in department of pediatrics of a tertiary care hospital

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### Abstract

**Background:** Seizure is the most common pediatric neurological disorder, occurring in 3-4% of children. The incidence is highest in children younger than 3 years of age, with a decreasing frequency in older children. Epidemiological studies reveal that approximately 150, 000 children will sustain a first-time, unprovoked seizure each year, and of those, 30, 000 will develop epilepsy. Studies focusing on the identification of associated etiological factors for seizures, their incidence, and outcomes are likely to improve management and referral strategies and subsequently reduce mortality and morbidity. **Aim of the Study:** To determine the proportion of childhood seizures among all admitted pediatric patients and to identify the underlying etiologies responsible for seizure presentations in this population.

**Methods:** This cross-sectional study was conducted in a tertiary care hospital in Dhaka from July 2012 to December 2012. Children aged 1 month to 15 years admitted with a history of seizures were included. Data were collected through structured questionnaires covering history, physical examination, and relevant laboratory tests. The proportion of seizure cases was determined by identifying all admitted patients with seizures during the study period. A total of 100 patients were randomly enrolled. Detailed history included seizure type, duration, associated conditions, family history, birth history, and developmental milestones. Physical examinations were performed for all patients. Investigations such as CBC, MP, serum electrolytes, calcium, Blood sugar, CSF analysis, EEG, CT scan, MRI, and cranial ultrasonography were performed when indicated.

**Results:** During the study period, 2, 273 patients were admitted, and seizures were found in 165 cases, giving a proportion of 72 per thousand or 7.26%. Among seizure cases, 59% were male and 41% female. The highest number of cases was recorded in August (37 cases) and the lowest in December (20 cases). Generalized seizures occurred in 90% and focal seizures in 10%. Among generalized seizures, 57.8% were male, while among focal seizures, 70% were male. Signs of CNS infection were present in 26.06% and absent in 73.94%. Febrile seizure was the most common cause (46%), followed by pyogenic meningitis (8%), epilepsy (6%), viral meningitis (3%), and tubercular meningitis (3%). Most febrile seizures occurred at 13-24 months (39.19%) and were mainly due to respiratory tract infection (60.86%). Overall, the highest seizure frequency was at 13-24 months (28%), followed by 7-12 months (27%). A history of perinatal asphyxia was associated with 80% generalized and 20% focal seizures. Family history of febrile seizure was positive in 21.15% of febrile cases. Single seizures occurred in 57% and multiple in 43%. Convulsion duration was <5 minutes in 41 cases, 5-30 minutes in 41, and >30 minutes in 18. Fever was present in 75 patients, among whom 61.33% had febrile seizures. Seizures stopped spontaneously in 36 cases; 59 required single-drug therapy and 5 required multidrug therapy. And CSF analysis was done in 30 cases, normal in 60% and abnormal in 40%.

**Conclusion:** The study "Etiology and Incidence of Childhood Seizures in the Department of Pediatrics of a Tertiary Care Hospital" was conducted at Ad-Din Women's Medical College Hospital over six months. Seizure disorder was found in 7.2% of all hospital-admitted patients aged 1 month to 15 years. The leading causes of childhood seizures were febrile seizure (46%), meningitis (8%), and epilepsy (6%). Most seizure patients were under 24 months of age. Many causes of seizures are preventable through measures such as vaccination (for pyogenic and TB meningitis) and public health awareness. Cerebral palsy and seizure disorders can be prevented by proper hospital delivery. Recurrence of febrile convulsions can be reduced by lowering body temperature with antipyretics and by using benzodiazepines to lower the seizure threshold during subsequent episodes of fever.

**Keywords:** Childhood seizure, etiology, pediatric neurology, febrile seizure, hospital prevalence

### Introduction

Seizures are common neurological disorders in pediatric age group patient and occurs in 3-5% of children [1]. A seizure (convulsion) is defined as a paroxysmal involuntary disturbance of brain function that may be manifested as impairment or loss of consciousness, abnormal motor activity, and behavioral abnormalities, sensory

Disturbances or autonomic disturbance [1]. Seizure is the most common pediatric neurological disorder, with 4% to 10% of children at least one seizure in the first 16 years of life [2]. Prevalence of specific neurological problems such as seizures is very significant [3]. Neurological problem account for the 10 percent of the total reason for attendance in the outpatient department [4]. In Bangladesh, intracranial infections 36% and febrile convulsions 24.67% are among the most common causes of childhood convulsions, followed by epilepsy 17.33% [5]. Bangladesh also showed intracranial infection 43.73%, febrile convolution 25.45% and epilepsy 8% were the major causes of childhood seizure [6]. Extensive work has been done in this field in developed countries. Each year about 150 thousand of children and adolescent in United States come to medical attention for evaluation of newly developing seizure disorder of some types [7]. There is diversity of etiology of seizure disorders. Fever is the commonest type of abnormality causing seizures. Five percent of all children will have fit under 5 years [8]. Common intracranial infections meningitis, encephalitis, cerebral malaria causes convulsion. In general, viral infection of CNS are common than bacterial infection which in turn are relatively commoner than parasitic or fungal infection [9]. Postinfectious neurological impairment persists, most commonly in cognition and motor function. Deficit includes more subtle problem, which can be difficult to detect on gross neurological assessment but may still be deleterious to the child's social and educational functioning. Extra cranial infection can cause convulsion [10]. Space occupying lesion of brain can give rise to convulsion. Approximately 2/3rd of all intra cranial tumors occurring in childhood between 2 to 10 years are infratentorial. Brain abscess can occur in children any age but is most common between 4 to 8 years [11]. Children with history of convulsion are more likely to have motor dysfunction. Convulsion is also poor educational and behavioral disorder. However, the invent of effective medication now enable most epileptic to lead normal life [9, 12]. The most common cause of fever leading to febrile convolution was upper respiratory tract infection (72%). There is a positive family history of febrile convolution in up to 30% of cases. Approximately 4% to 10% of children have an unprovoked seizure without recurrence, and incidence of afebrile seizure are highest in children younger than 3 years [13, 14]. Seizure is a commonly observed phenomenon both in Bangladesh and all over the developing countries. Acute seizure is a common cause of pediatric admission to hospitals in resource poor countries and a risk factor for neurological and cognition impairment and epilepsy. This study aims to find out the etiology of childhood seizures and proportion of seizure patient during this period.

### Methodology & Materials

This cross-sectional study was conducted in the Department of Pediatrics at Ad-Din Women's Medical College Hospital. The study period covered six months from July 2012 to December 2012. The calculated sample size was 69. To strengthen representativeness, a total of 100 eligible cases were finally enrolled during the study period. A random purposive sampling technique was used for selecting participants. The aim of the study is to identify the underlying causes of seizures in children and determine their occurrence among admitted pediatric patients.

### Inclusion criteria

- Child having a history of convulsion once or more, in hospital or before admission to hospital.
- 1 month to 15 years age of child

### Exclusion criteria

- Children under 1 month or over 15 years of age (Infants under 1 month were excluded due to difficult management, need for life support, and higher infection risk).
- Children whose parents did not provide written consent.

### Ethical Considerations

Participation in this study was absolutely volunteered. Consent was obtained after explanation about the study in Bengali to all respondents. Everyone had the rights to take part or refuse any part of the study. The collected data from the participants were very much confidential.

### Operational Definition

Seizure- A seizure is defined as a transient, involuntary alteration of consciousness, behavior, motor activity, sensation, or autonomic function caused by an excessive rate and hypersynchrony of discharge from a group of cerebral neurons. The classic definition of status epilepticus refers to continuous or recurrent seizure activity lasting longer than 30 minutes without recovery of consciousness.

### Data Collection

Data were collected using a structured questionnaire through history taking, physical examination, and relevant laboratory investigations. A total of 100 patients with seizure disorders were enrolled. Detailed history included seizure type and duration, associated conditions, family history of seizures, birth history, and developmental milestones. Physical examination was performed in all cases. Investigations such as complete blood count, malaria parasite (MP) test, serum electrolytes, calcium, blood sugar, cerebrospinal fluid (CSF) analysis, electroencephalography (EEG), computed tomography (CT), magnetic resonance imaging (MRI), and cranial ultrasonography were conducted when indicated.

### Statistical Analysis

Data were processed and analyzed using computer software SPSS 16 (Statistical Package for Social Science). Descriptive statistics was done (percentage, frequency) and cross tabulation.

### Result

Table 1 shows the number of cases and seizures found where July 277 and 24, August 410 and 37, September 507 and 33, October 443 and 25, November 396 and 26, December 240 and 20. Similarly among the 165 seizure cases over six months, with 43 having CNS infection and 122 without; highest in August 37 and lowest in December 20 explains in (Table 2). In 46 children with febrile seizures, most were aged 13-24 months 39.13%, males predominated 63.04%, and generalized seizures were most common 46.74%, followed by simple 32.61% and atypical 17.39% examines in (Table 3). The major causes of febrile seizures in 52 patients were respiratory tract infection 60.86% and gastroenteritis 28.26%. Among 100 seizure cases, febrile

seizure was most common 46.00%, followed by pyogenic meningitis 8.00% and epilepsy 6.00%, while other causes each contributed 1-3% illustrates in (Table 4). Table 5 demonstrates that generalized seizures predominated in febrile seizure 47.77%, pyogenic meningitis 8.90%, Epilepsy 4.40%, cerebral palsy with developmental delay 3.30%, and others 2.20-1.10%. Focal seizures were mainly febrile seizure 30.00%, epilepsy 20.00%, and other causes 10.00%. Among 100 children, febrile seizure was most common, mainly in 7-24 months with 46 cases. Pyogenic meningitis 8, septicemia 3, epilepsy 6, and cerebral palsy-related seizures 4 occurred across 1-60 months. Metabolic, infectious, and post-meningitis causes such as kwashiorkor 3, dengue hemorrhagic fever 2, hepatic encephalopathy 2, tubercular/viral meningitis 3, and intracranial tumor 1 were less frequent, mostly in children under 5 years shows in (Table 6). Among children, generalized seizures occurred with antenatal events 8.90%, perinatal asphyxia 13.30%, gastroenteritis 15.60%, respiratory infection 35.60%,

hepatic encephalopathy 2.20%, AGN 2.20%, and none 44.44%. Focal seizures occurred with perinatal asphyxia 30.00%, gastroenteritis 20.00%, respiratory infection 30.00%, and none 50.00% highlights in (Table 7). Past history of seizure showed generalized seizures with neonatal jaundice 12.20%, meningoencephalitis 2.20%, measles 12.20%, trauma 1.10%, hydrocephalus 1.10%, and known epilepsy 4.40%. Focal seizures occurred with meningoencephalitis 10.00%, intracranial tumor 10.00%, hydrocephalus 20.00%, and congenital brain malformation 10.00% examines in (Table 8). Finally normal findings were most common in febrile seizure 50.00%, septicemia 16.67%, viral meningitis 11.11%, encephalitis 5.56%, epilepsy 5.56%, and cerebral malaria 5.56%. Abnormal findings predominated in pyogenic meningitis 58.33%, tubercular 16.67%, viral meningitis 8.33%, kwashiorkor with pyogenic meningitis 8.33%, and acute lymphoblastic leukemia 8.33% explains in (Table 9).

**Table 1:** Seizure proportion in admitted children (1 month-15 years) over 6 months

| Months    | No. of patients admitted | Seizures found in number of cases |
|-----------|--------------------------|-----------------------------------|
| July      | 277                      | 24                                |
| August    | 410                      | 37                                |
| September | 507                      | 33                                |
| October   | 443                      | 25                                |
| November  | 396                      | 26                                |
| December  | 240                      | 20                                |

**Table 2:** Seizure patient with CNS infection

| Months            | No. of patients ē seizure | No. of seizure patients ē CNS infection | No. of seizure patients without CNS infection |
|-------------------|---------------------------|---|---|
| July              | 24                        | 8                                       | 16  |
| August            | 37                        | 13                                      | 24  |
| September         | 33                        | 6                                       | 27  |
| October           | 25                        | 5                                       | 20  |
| November          | 26                        | 7                                       | 19  |
| December          | 20                        | 4                                       | 16  |
| Total in 6 months | 165                       | 43                                      | 122   |

**Table 3:** Baseline characteristics of the respondents

| Variables                 | Frequency (n) |  | Percentage (%) |
|---------------------------|---------------|--|----------------|
|                           | Age (months)  |  |                |
| 1-6                       | 5             |  | 10.87          |
| 7-12                      | 15            |  | 32.61          |
| 13-24                     | 18            |  | 39.13          |
| 25-60                     | 6             |  | 13.04          |
| 61-120                    | 2             |  | 4.35           |
| 121-180                   | 0             |  | 0              |
| Gender                    |               |  |                |
| Male                      | 29            |  | 63.04          |
| Female                    | 17            |  | 36.96          |
| Nature of febrile seizure |               |  |                |
| Simple                    | 30            |  | 32.61          |
| Atypical                  | 16            |  | 17.39          |
| Generalized               | 43            |  | 46.74          |
| Focal                     | 3             |  | 3.26           |

**Table 4:** Etiology of seizures and causes of febrile seizures in children

| Variables  | Frequency (n) | Percentage (%) |
|--|---------------|----------------|
| <b>Causes of febrile seizure (n=52)</b>                    |               |                |
| Respiratory tract infection                                | 28            | 60.86          |
| Gastroenteritis  | 13            | 28.26          |
| Urinary tract infection                                    | 5             | 10.86          |
| <b>Etiology of seizure (n=100)</b>                         |               |                |
| Febrile seizure  | 46            | 46.00          |
| Acute lymphoblastic leukemia                               | 1             | 1.00           |
| Acute watery diarrhea with hypernatremia with hypoglycemia | 2             | 2.00           |
| AGN with hypertensive encephalopathy                       | 2             | 2.00           |
| Cerebral malaria   | 2             | 2.00           |
| Cerebral palsy with bronchopneumonia                       | 2             | 2.00           |
| Cerebral palsy with epilepsy with developmental delay      | 3             | 3.00           |
| Cerebral palsy with epilepsy with kwashiorkor              | 1             | 1.00           |
| Dengue hemorrhagic fever with intracranial hemorrhagic     | 2             | 2.00           |
| Encephalitis   | 1             | 1.00           |
| Epilepsy   | 6             | 6.00           |
| Epilepsy & hydrocephalus due to post meningitis sequelae   | 2             | 2.00           |
| Epilepsy with lobar pneumonia                              | 1             | 1.00           |
| Hepatic encephalopathy                                     | 2             | 2.00           |
| Intracranial tumor with obstructed hydrocephalus           | 1             | 1.00           |
| Kwashiorkor with hypoglycemia                              | 1             | 1.00           |
| Kwashiorkor with hyponatremia with hypocalcemia            | 1             | 1.00           |
| Kwashiorkor with pyogenic meningitis                       | 1             | 1.00           |
| Operated meningocele with hydrocephalus with epilepsy      | 1             | 1.00           |
| Pyogenic meningitis  | 8             | 8.00           |
| Pyogenic meningitis with pneumonia                         | 1             | 1.00           |
| Septicemia   | 3             | 3.00           |
| Shigella encephalopathy                                    | 1             | 1.00           |
| Sturge weber syndrome                                      | 1             | 1.00           |
| Typhoid encephalopathy                                     | 2             | 2.00           |
| Tubercular meningitis                                      | 3             | 3.00           |
| Viral meningitis   | 3             | 3.00           |

**Table 5:** Distribution of childhood seizures according to type and underlying etiology (n=100)

| Causes of seizure  | Types of seizure |       |       |       |
|--|------------------|-------|-------|-------|
|  | Generalized      |       | Focal |       |
|  | n                | %     | n     | %     |
| Febrile seizure  | 43               | 47.77 | 3     | 30.00 |
| Acute lymphoblastic leukemia                               | 0                | 0.00  | 1     | 10.00 |
| Acute watery diarrhea with hypernatremia with hypoglycemia | 2                | 2.20  | 0     | 0.00  |
| AGN with hypertensive encephalopathy                       | 2                | 2.20  | 0     | 0.00  |
| Cerebral malaria   | 2                | 2.20  | 0     | 0.00  |
| Cerebral palsy epilepsy with bronchopneumonia              | 2                | 2.20  | 0     | 0.00  |
| Cerebral palsy with epilepsy with developmental delay      | 3                | 3.30  | 0     | 0.00  |
| Cerebral palsy with epilepsy with kwashiorkor              | 1                | 1.10  | 0     | 0.00  |
| Dengue hemorrhagic fever with intracranial hemorrhage      | 2                | 2.20  | 0     | 0.00  |
| Encephalitis   | 1                | 1.10  | 0     | 0.00  |
| Epilepsy   | 4                | 4.40  | 2     | 20.00 |
| Epilepsy & hydrocephalus due to post meningitis sequelae   | 1                | 1.10  | 1     | 10.00 |
| Epilepsy with lobar pneumonia                              | 1                | 1.10  | 0     | 0.00  |
| Hepatic encephalopathy                                     | 2                | 2.20  | 0     | 0.00  |
| Intracranial tumor with obstructed hydrocephalus           | 0                | 0.00  | 1     | 10.00 |
| Kwashiorkor with hypoglycemia                              | 1                | 1.10  | 0     | 0.00  |
| Kwashiorkor with hyponatremia with hypocalcemia            | 1                | 1.10  | 0     | 0.00  |
| Kwashiorkor with pyogenic meningitis                       | 1                | 1.10  | 0     | 0.00  |
| Operated meningocele with hydrocephalus with epilepsy      | 1                | 1.10  | 0     | 0.00  |
| Pyogenic meningitis  | 8                | 8.90  | 0     | 0.00  |
| Pyogenic meningitis with pneumonia                         | 1                | 1.10  | 0     | 0.00  |
| Septicemia   | 3                | 3.30  | 0     | 0.00  |
| Shigella encephalopathy                                    | 1                | 1.10  | 0     | 0.00  |
| Sturge weber syndrome                                      | 0                | 0.00  | 1     | 10.00 |
| Typhoid encephalopathy                                     | 2                | 2.20  | 0     | 0.00  |
| Tubercular meningitis                                      | 2                | 2.20  | 1     | 10.00 |
| Viral meningitis   | 3                | 3.30  | 0     | 0.00  |

**Table 6:** Distribution of patient with seizures according to age group (n=100)

| Causes of seizure  | Age group (month) of seizure |      |       |       |        |
|--|------------------------------|------|-------|-------|--------|
|  | 1-6                          | 7-12 | 13-24 | 25-60 | 61-120 |
| Febrile seizure  | 5                            | 15   | 18    | 6     | 2      |
| Acute Lymphoblastic leukemia                               | 0                            | 0    | 0     | 1     | 0      |
| Acute watery diarrhea with hypernatremia with hypoglycemia | 0                            | 2    | 0     | 0     | 0      |
| AGN with hypertensive encephalopathy                       | 0                            | 0    | 0     | 1     | 1      |
| Cerebral malaria   | 0                            | 0    | 0     | 0     | 2      |
| Cerebral palsy with epilepsy with bronchopneumonia         | 0                            | 1    | 1     | 0     | 0      |
| Cerebral palsy with epilepsy with developmental delay      | 1                            | 0    | 1     | 1     | 0      |
| Cerebral palsy with epilepsy with kwashiorkor              | 0                            | 0    | 0     | 1     | 0      |
| Dengue hemorrhagic fever with intracranial hemorrhage      | 0                            | 0    | 0     | 0     | 2      |
| Encephalitis   | 0                            | 0    | 0     | 0     | 1      |
| Epilepsy   | 1                            | 1    | 3     | 1     | 0      |
| Epilepsy with lobar pneumonia                              | 0                            | 0    | 0     | 1     | 0      |
| Hepatic encephalopathy                                     | 0                            | 0    | 0     | 2     | 0      |
| Epilepsy & hydrocephalus due to post meningitis sequale    | 0                            | 0    | 0     | 2     | 0      |
| Intracranial tumor with obstructed hydrocephalus           | 0                            | 0    | 1     | 0     | 0      |
| Kwashiorkor with hypoglycemia                              | 0                            | 1    | 0     | 0     | 0      |
| Kwashiorkor with hyponatremia with hypocalcemia            | 1                            | 0    | 0     | 0     | 0      |
| Kwashiorkor with pyogenic meningitis                       | 0                            | 1    | 0     | 0     | 0      |
| Operated meningomyelocele with hydrocephalus with epilepsy | 0                            | 1    | 0     | 0     | 0      |
| Pyogenic meningitis  | 3                            | 1    | 3     | 1     | 0      |
| Pyogenic meningitis with pneumonia                         | 1                            | 0    | 0     | 0     | 0      |
| Septicemia   | 3                            | 0    | 0     | 0     | 0      |
| Shigella encephalopathy                                    | 0                            | 0    | 0     | 1     | 0      |
| Sturge weber syndrome                                      | 0                            | 0    | 0     | 1     | 0      |
| Tubercular meningitis                                      | 0                            | 2    | 0     | 1     | 0      |
| Typhoid encephalopathy                                     | 0                            | 0    | 0     | 0     | 2      |
| Viral meningitis   | 0                            | 2    | 1     | 0     | 0      |

**Table 7:** Convulsion types by history and associated conditions

| Variables  | Types of convulsions |       |       |       |
|--|----------------------|-------|-------|-------|
|  | Generalized          |       | Focal |       |
|  | n                    | %     | n     | %     |
| <b>Seizure Occurrence by antenatal and perinatal history</b> |                      |       |       |       |
| Antenatal history was eventful                               | 8                    | 8.90  | 0     | 0.00  |
| History of perinatal asphyxia                                | 12                   | 13.30 | 3     | 30.00 |
| <b>Convulsion type by associated condition</b>               |                      |       |       |       |
| Gastroenteritis  | 14                   | 15.60 | 2     | 20.00 |
| Respiratory tract infection                                  | 32                   | 35.60 | 3     | 30.00 |
| Hepatic encephalopathy                                       | 2                    | 2.20  | 0     | 0.00  |
| AGN  | 2                    | 2.20  | 0     | 0.00  |
| None   | 40                   | 44.44 | 5     | 50.00 |

**Table 8:** Distribution of seizure according to past history

| Past history of seizure          | Types of seizure |       |       |       |
|----------------------------------|------------------|-------|-------|-------|
|                                  | Generalized      |       | Focal |       |
|                                  | n                | %     | n     | %     |
| Neonatal jaundice                | 11               | 12.20 | 0     | 0.00  |
| Meningoencephalitis              | 2                | 2.20  | 1     | 10.00 |
| Measles                          | 11               | 12.20 | 0     | 0.00  |
| Intracranial tumor               | 0                | 0.00  | 1     | 10.00 |
| Trauma to brain                  | 1                | 1.10  | 0     | 0.00  |
| Hydrocephalus                    | 1                | 1.10  | 2     | 20.00 |
| Metabolic disorder               | 0                | 0.00  | 0     | 0.00  |
| Congenital malformation of brain | 0                | 0.00  | 1     | 10.00 |
| Known epilepsy                   | 4                | 4.40  | 0     | 0.00  |

**Table 9:** Results of CSF study (n=30)

| Causes of seizure                    | Normal |       | Abnormal |       |
|--------------------------------------|--------|-------|----------|-------|
|                                      | n      | %     | n        | %     |
| Febrile seizure                      | 9      | 50.00 | 0        | 0.00  |
| Pyogenic meningitis                  | 1      | 5.56  | 7        | 58.33 |
| Kwashiorkor with pyogenic meningitis | 0      | 0.00  | 1        | 8.33  |
| Viral meningitis                     | 2      | 11.11 | 1        | 8.33  |
| Tubercular                           | 0      | 0.00  | 2        | 16.67 |
| Septicemia                           | 3      | 16.67 | 0        | 0.00  |
| Encephalitis                         | 1      | 5.56  | 0        | 0.00  |
| Epilepsy                             | 1      | 5.56  | 0        | 0.00  |
| Cerebral malaria                     | 1      | 5.56  | 0        | 0.00  |
| Acute lymphoblastic leukemia         | 0      | 0.00  | 1        | 8.33  |

## Discussion

Seizure is a common neurological disorder of children which leads to hospital admission. Illingworth reported that seizures occur in 7% of all children in the first five years of life and 1% of all new born [15]. A study was done by Islam M N *et al* in the department of paediatrics, BSMMU, Dhaka, Bangladesh showed that neurological cases were 8.9% of total hospital admission during one year period [16]. In this study during the 6 months period of time total number of patients admitted in the paediatric department was 2273 out of them 165 patients presented with seizures or history of seizures. The proportion of seizures was found 72 per thousand in 6-month period or 7.2 percent of all hospital admitted patient. It is lower than that of the study in BSMMU because that study included all the neurological cases irrespective of seizure disorder. Though admitted patients do not represent whole population proportion of seizure which is shown here cannot be said to be the incidence rate of that population, but it is representative of population because all the patients of this area whether with seizure or not, come to ad-din medical college hospital for treatment. Further population based multi centre study is needed to understand the exact incidence of seizures. Out of 165 seizure cases, 26.06% (n=43) cases presented with CNS infection which is lower than the study of Islam MN *et al* where CNS infection present in 36% cases [16]. Without sign symptoms of CNS infection was 73.94% (n=122). Highest number of patients presented with CNS infection at the month of August (13), lowest at the month of December (4). 27 patients presented with seizures without CNS infection at the month of September, which is highest, 16 at July and December which is lowest. Out of 100 seizure patient 59% (n=59) were male and 41% (n=41) were female. A total of 100 cases were studied of them 46% (n=46) presented with febrile seizures. Out of 46, 43 developed generalized and 3 developed focal seizure which is higher than study of Haque *et al.* 53% & Biswas *et al.* 61.2% [17, 18]. Current study febrile seizure was more common in boys 29(63.04%), 17(36.95%) were female. Febrile seizure is slightly more in boys, out of 46 febrile seizures cases 65.2% (n=32) was simple and 34.75% (n=16) were atypical febrile seizure which is consistent with the study by al -Eissa *et al* in 1992, 62% cases were simple and 38% were atypical nature [19, 20]. In present study 43.34% (n=20) of children had febrile seizure below 12 months, 82.6% (n=38) below 24 months. Most febrile seizure was occurred between 13-24 months age 39.13% (n=18) of total febrile seizure. These study correlate with study conducted by Siddiqui (2002) where 39.5% cases were below 12 months [21]. In this study febrile seizure occurred 60.86% (n=28) due to respiratory tract infection, gastroenteritis 28.26% (n=13) and 10.86% (n=5)

due to urinary tract infection. Rantala *et al* showed that, the most common cause of fever leading to febrile seizure was respiratory tract infection 72% [22]. Out of 100 seizure cases, febrile seizure is the most common convulsive disorder in young children accounting for 46% of all seizure disorder. Pyogenic meningitis 8%, epilepsy 6% and TB meningitis 3% was leading cause of childhood seizure. This is similar to previous reported incidence of febrile seizure between 48-50% among patient presented with convulsion [23] which is some differ with the study of Islam M N *et al* where meningitis was 24.55%, febrile seizure 13.4%, epilepsy was 8.18% cause of childhood seizures [16]. Out of 100 cases 90% (n=90) presented with generalized seizures which is consistent with the study of Haque *et al.* 53% & Biswas *et al.* 61.2% [17, 18]. Where 10 cases presented with focal seizures. All patients of bacterial meningitis were under 5 years of age which is consistent with the study of Nakhaei *et al.* 37.4% [24]. Age of the patients range from 1 month to 15 years. Out of 100 seizure patients 68 (68%) were within 24 months of age which was higher with the study of Islam M N (47.33%) [16]. Total 15 patients had history of perinatal asphyxia; 80% (n=12) developed generalized seizure and 20% (n=3) were developed focal seizure. Out of 15 perinatal asphyxiated patient 46.67% (n=7) had either cerebral palsy with developmental delay or epilepsy alone. Out of 100 seizure cases 14 patients had positive family history of febrile seizure. Siddiqui TS has reported that 20% of children with positive family history [21]. Signs of meningeal irritation was present only 6 patient, 8 patient had bulging fontanel. Out of 100 seizure cases 55 patients had associated condition at admission. Out of 100 seizure cases 11% patient had past history of neonatal jaundice, 11% had patient measles, 3% had meningoencephalitis, and 4% was known cases of epilepsy. Those had fever (n=75), 61.33% (n=46) developed febrile seizure which is higher than study of Hamid *et al.* [25]. Status epilepticus was 18% in this study. CSF study was done in 30 cases; findings was normal in 60% (n=18), abnormal 40% (n=12). EEG and imaging studies were performed in 33 of the patients. MP was found in 2 cases. Sturge weber disease and intracranial tumour was confirmed by CT scan.

## Limitations of the Study

This study was conducted in a tertiary care single hospital in Dhaka, so the study findings may not reflect the exact scenario of the population. The current study was conducted among 100 patients, not a large study to draw a definite conclusion. Study was done in single centre; to find out exact incidence of seizures a vast population and multi-centre based study should be carried out.

## Conclusion and Recommendations

The study “Etiology and Incidence of Childhood Seizure Department of Pediatrics of a Tertiary Care Hospital” was done in the Ad-din women’s medical college hospital for a period of six months. Seizure disorder was found in 7.2% cases of all hospital admitted patients (1 month to 15 years age group). The common leading cause of childhood seizure due to febrile seizure (46%), meningitis (8%) and epilepsy (6%). Most of seizure patient was under 24 months of age. Many preventable causes of seizures which can be prevented by different measures like vaccination (pyogenic and TB meningitis) or public health awareness. Cerebral palsy and seizure disorder can be prevented by proper delivery at hospital. Recurrence of febrile convulsion can be prevented by lowering body temperature by antipyretics and lowering seizure threshold effectively by benzodiazepine during further episodes of fever due to any cause.

To find out exact aetiology of seizures a vast population and multi-centre based study should be carried out. Febrile seizure was the most leading cause of childhood seizure. Overall preventive measures can reduce the incidence of seizure in large scale.

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