

RESEARCH ARTICLE

Seizure in pediatric age group

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ABSTRACT

Background: Seizures are the most common pediatric neurologic disorder, with 4% to 10% of children suffering at least one seizure in the first 16 years of life.

Objectives: To determine the characteristics of seizures among pediatric age group and to identify the most common causes and risk factors associated with such seizures.

Methods: The present study was conducted as a cross sectional study on a group of 300 pediatrics with seizures admitted to the pediatrics department of the Misurata Central Hospital, Libya during the period from January to December 2013 aiming to: determine the characteristics of seizures among pediatric age group and to identify the most common causes and risk factors associated with such seizures.

Results: Among the studied group (56.7%) were males and (43.3%) were females, mainly of 1-6 years old (about 47.7%). Seizure was of generalized type (about 94.0%), while only (6 %) was of partial type with equal distribution on both sides. The majority of seizure was simple (65.7%) and of duration <15 Minute (86.7%). Fever is the main cause of seizure (62.7%) followed by neurological problems and idiopathic issue (21.3% and 11.7%) respectively.

Conclusion: Seizures are a common pediatric neurologic disorder, mainly it is of generalized type, simple character with duration <15 Minute and of febrile origin without associated CBC or electrolyte abnormalities.

Key words: Questionnaire, Statistical analysis of the Results.

INTRODUCTION

A seizure occurrence of signs and/or symptoms resulting from abnormal excessive or synchronous neuronal activity in the brain account for 1% of all pediatric emergency department visits. Seizure disorder is a general term that is usually used to include any one of several disorders include epilepsy, febrile seizures, and possibly single seizures secondary to metabolic, infectious, or other etiologies (e.g. hypocalcemia and meningitis). Seizure provoked by a reversible insult (e.g. fever and hypoglycemia) do not fall under definition of epilepsy (unless epilepsy occurs in 15-60% of children with cerebral palsy (Ricordo and Kliegman, 2011). Epileptic seizure is sometimes used to distinguish a seizure caused by abnormal neuronal firing from a paroxysmal non epileptic event such as pseudoseizure or syncope (Jose and Cavazos, 2004). Febrile seizures are seizures that occur between the age of (6 and 60 months) with a temperature of 38°C or higher, that are not the result of central nervous system infection or any metabolic imbalance, and that occur in the absence of history of prior a febrile convulsion. A simple febrile seizure is a primary generalized, usually tonic-clonic, attack associated with fever, lasting for a maximum of 15 min, and not recurrent within 24-hour period. While, a complex febrile seizure is more prolonged (>15min), is focal, and/or recurs within 24 hour. Febrile status epilepticus is a febrile seizure lasting (>30min).

Epilepsy is a disorder of the brain characterized by an enduring predisposition to generate seizures and by the neurological, cognitive, psychological, and social consequences of this condition. The clinical diagnosis of epilepsy usually requires the occurrence of at least (1) unprovoked epileptic seizure with either a second such seizure or enough not recurrent within 24 hour period (Jose and Cavazos, 2004). Status epilepticus is a medical emergency that should be anticipated in any patient who presents with a seizure activity or recurrent seizure without regaining of consciousness lasting for > 30 min. Approximately 4 – 10 % of children experience at least 1 seizure in the first 16 years of life. Between 2 % and 5 % of neurologically healthy infants and children experience at least (1), usually simple, febrile seizure (Berg, 2002). Approximately 30 % of patient who have a first febrile seizure have later epilepsy: the risk is about 20 % if neurologic examination, EEG and neuroimaging are normal (Tang-Wai et al., 2005). Febrile seizures recur in approximately 50 % after 2 or more episodes, and in 50 % of infants < 1 years old at febrile seizure onset. Several factors affect recurrence risk, although about 15 % of children with epilepsy have had febrile seizures, only 2-7% of children who experience febrile seizures proceed to develop epilepsy later in life (Luis and Febrile, 2010).

MATERIALS AND METHODS

Study design and setting: The present study was conducted as a cross sectional study on a group of pediatrics with seizures admitted to the department of pediatrics of the Central Hospital

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in Misurata city, Libya during the period from January to December 2013.

Subjects

The study sample involved a group of 300 peditrics with seizures aged < 14 years. They were randomly selected from peditrics admitted to pediatric department of Misurata Central Hospital suffering from seizures. They were included as follow:

Inclusion criteria were as follow

- Being younger than 14 years of age
- Being admitted to pediatric department of Misurata Central Hospital
- Developmentally well patient
- Developmentally delayed or mentaly retarded patient
- Exclusion criteria were as follow:
- Being older than 14 years
- Patients who were seen as outpatient
- Patients who were admitted to surgical ward post accidental injury
- Having no clear seizure events (mimic seizure)

MATERIALS AND METHODS

Questionnaire

The study group was interviewed by a pre-constructed questionnaire that was developed for the purpose of this study. Detailed data were collected on a special data collecting sheet including data about age, sex, seizure character as generalized or partial, simple or atypical, duration of seizure (<15 min or > 15 min), site of seizure, recurrence of seizure and the presence of abnormal neurological signs. Also, it contains data about the history of prior seizure, history of previous neurological insult, birth history, history of neonatal convulsion, family history of seizure, and history of parental consanguinity. Finally, it included data about the probable causes of such seizures. Detailed physical and neurological examination was done on all studied children in our study.

Blood samples for laboratory investigations

All patients were investigated for (CBCs, serum electrolytes, ABG).

Others

Lumber puncture was restricted to first febrile seizure for those aged <1 year, complex febrile seizure, those received antibiotics or those septic look patient, here we always take a consideration to do fundal examination in case of the fontanlla closed . A though most patients their seizure attack didn't take long to stop it with anticonvulsants unless the most common drug was used is Diazepam I.V except in few occasions where I.vacces was defficult to obtain I.M midazolam has been used Immaging study was taken in certain events where local CNS cause has been put in the mind. EEG mostly prescribed in follow up clinic.

Statistical analysis of the results

The collected date was analyzed by SPSS software version 18 and the results was summarized as frequencies and percentage for qualitative data, and as mean + SD for quantitative

measurements and then data was presented and displayed in suitable tables and graphs.

Statistical analysis was performed using Chi-square test for qualitative data, and student's test for quantitative measurements. Logistic regression models were used to assess the relationship between vaccine response and variables. Results were considered significant when P≤ 0.05.

RESULTS

(56.7%) of studied group was males and (43.3%) was females. The majority of the studied group was 1-6 years old (about 47.7%). There was no significant difference among different age groups regarding sex distribution

Table 1. General characteristics of the studied group

		Age				Total
		Up to 1 Month	> 1 Month - 1 Year	> 1 Year - 6 Years	> 6 Year - 14 Years	
Sex Male	Number	1	74	77	18	170
	%	33.3%	60.7%	53.8%	56.3%	56.7%
Female	Number	2	48	66	14	130
	%	66.7%	39.3%	46.2%	43.8%	43.3%
Total	Number	3	122	143	32	300
	%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square = 1.92

p- value = 0.589 (Non Significant)

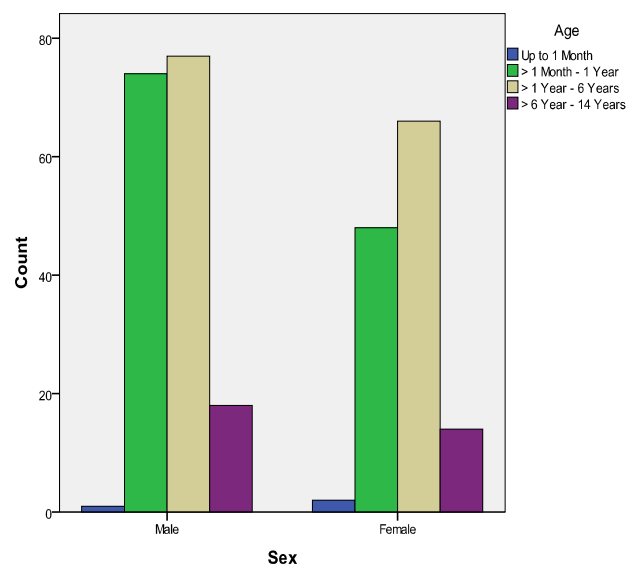


Table 2. Type of seizure among the studied group

Type of seizure	Frequency	Percent
Partial	18	6.0
Generalized	282	94.0
Total	300	100.0

Chi-Square = 141.9 p- value < 0.001 (Highly Significant)

The majority of seizure among the studied group was of generalized type (about 94.0%). And that was highly significant.

The majority of seizure duration among the studied group was <15 Minute (about 86.7%). And that was highly significant.

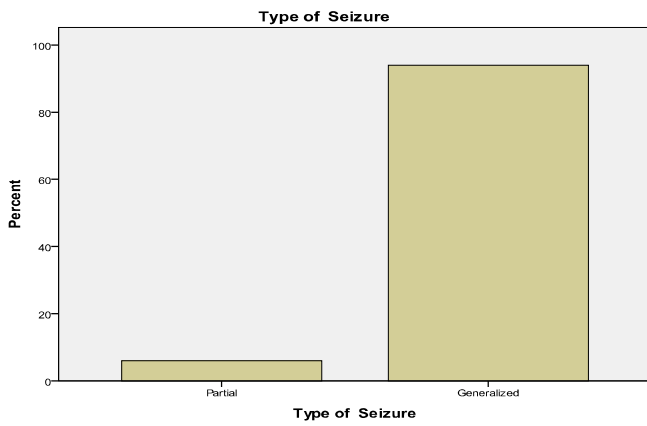


Table 3. Duration of seizure among the studied group

Duration of Seizure	Frequency	Percent
< 15 Minute	260	86.7
≥ 15 Minute	40	13.3
Total	300	100.0

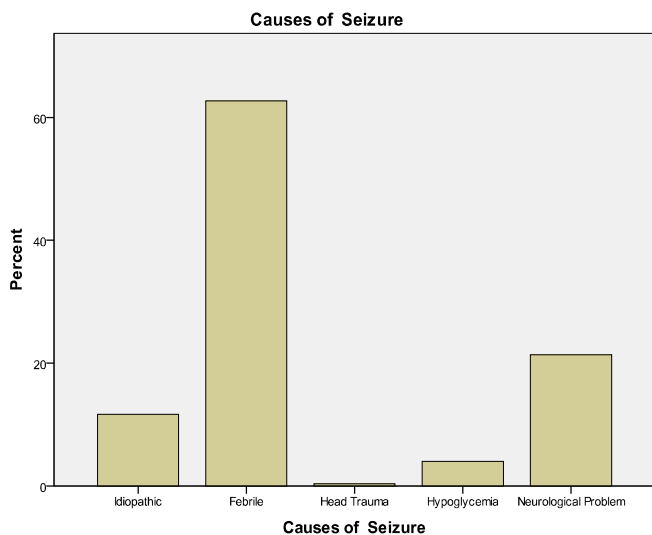
Chi-Square = 93.2 p- value < 0.001 (Highly Significant)

Table 4. Causes of Seizure among the studied group

Causes of Seizure	Frequency	Percent
Idiopathic	35	11.7
Febrile	188	62.7
Head Trauma	1	.3
Hypoglycemia	12	4.0
Neurological Problem	64	21.3
Total	300	100.0

Chi-Square = 161.8 p- value < 0.001 (Highly Significant)

The majority of seizure among the studied group was febrile or due to neurological problem (about 62.7% and 21.3%) respectively. And that was highly significant.



DISCUSSION

Seizures are the most common pediatric neurologic disorder, with 4% to 10% of children suffering at least one seizure in the first 16 years of life. The incidence is highest in children younger than 3 years of age, with a decreasing frequency in older children (Tang-Wai *et al.*, 2005). The present study was conducted as a cross sectional study on a group of 300 pediatrics with seizures admitted to the pediatrics department of the Misurata Central Hospital, Libya during the period from

January to December 2013 aiming to: determine the characteristics of seizures among pediatric age group and to identify the most common causes and risk factors associated with such seizures. The results of our study showed that the majority of seizure among the studied group was of generalized type (about 94.0%) but carrying a high significant value comparing with a study that was carried by Saravanan, in which 41% of studied group had partial seizures and 59 % had generalized seizure. The site of partial seizure among the studied group was equal right and left (50.0%). And that was non significant (Saravanan, 2013). Also, in our study, the majority of seizure duration among the studied group was that of <15 Minute (about 86.7%) and this emphasized by a normal PH (94.3%) in majority of patients. This is of course has effect of seizure recurrence and increase the chance of epilepsy occurrence. Dale *et al.* stated that like the distribution of afebrile seizure duration in children, the distribution of first FS duration is best modeled by assuming 2 populations. Developmental delay and younger age are associated with prolonged FSs. Our data lend further support to defining 10 minutes as the upper limit for a simple FS (Dale *et al.*, 2011). In our study The majority of seizure among the studied group was found the fever is the first associated risk factor which was (about 62.7%) this is indeed is supported by most studies documented in pediatric books in which categorized as a special identity named as febrile convulsion, while the other risks was the neurological problem (21.3%) taking the upper hand and this is of course affect the way of taking a special investigation and management in the mind. And that was highly significant. In a study, conducted by *Chen et al.*, it was found that among 319 patients, 218 (68%) presented with seizures and fever and 299 (94%) children were younger than 6 years of age. Generalized tonic-clonic seizures were the most common type (71.2%). Febrile seizures (62.1%) were the main etiology of the first seizure (p < 0.001). Abnormal brain images were noted in 16 (26%) of 61 patients, most (12/16, 75%) of whom had abnormal histories and physical or neurologic examinations (Chen *et al.*, 2010).

Conclusion

Among the studied group (56.7%) were males and (43.3%) were females and they were mainly of 1-6 years old (about 47.7%). The majority of seizure among the studied group was of generalized type (about 94.0%), while only (6 %) was of partial type with equal distribution on both right and left sides (50.0%). The majority of seizure was simple (about 65.7%) and of duration <15 Minute (about 86.7%). Fever still take the upper hand in the causes of seizure (62.7%) followed by neurological problems and idiopathic issue (21.3% and 11.7%) respectively.

Recommendation

- Early diagnosis and proper management of childhood seizures as it constitutes the commonest neurological problem in children. And to avoid a considerable treatment gap that exists in developing countries due to poverty, stigmatization, and lack of trained manpower. Uncontrolled seizures put patients at risk for significant morbidity and mortality.
- FS are the commonest, the majority of seizure was simple and of duration <15 Minute. Unfortunately, FSE is frequently not recognized and they should be

treated acutely if they continue for past 5 minutes to avoid long term consequences.

- Further studies with large sample size covering both urban and rural population will give more information about the characteristics and risk factors of pediatric seizure in our country.

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