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Febrile seizures: What do you want to know?

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Abstract

Background: Febrile seizures are benign, self-limiting, and most common convulsive disorders that occur between the age of 6 and 60 months, but at the same time, it is also a major challenge in pediatric practice and it is an alarming event in the lives of both child and parents. **Objectives:** To detect the incidence, causes of febrile seizures and to find out the correlation between febrile seizures and certain parameters. **Materials and Methods:** An observational organized prospective clinical study was performed on 235 children with febrile seizures attending the pediatric department in Tobruk Medical Center 2018. A questionnaire was administered to parents who included items regarding age at admission, gender, recurrence, mode of delivery, cause of fever, family history of febrile seizures, and family history of epilepsy with febrile seizures. **Results:** Febrile seizure represent (7 %) of total admission in the pediatric department at Tobruk Medical Center 2018. Most commonly occur in the second year of life, (40.4 %) of cases diagnosed as febrile seizures in this age group. It's more common in males than females with a male-female ratio of (1.53:1). Simple febrile seizures were more common than complex febrile seizures (85.5% vs. 14.5%). Respiratory tract infection is the main cause of fever in patients with febrile seizures (74%). Most of the case is the first attack (88.5%). A family history of febrile seizures was present in (24%) of the cases, while a family history of epilepsy was present with (11 %) seizures of the cases. **Conclusions:** The febrile seizures are a benign condition and all admitted Children recovered and discharged without any significant complication. Incidence and prevalence are different according to many factors. It is predominantly seen in males. The most causative factor was the respiratory tract infection. With the peak age of incidence in the second year of life. Simple febrile seizures were a more common type. Family history of febrile seizures and epilepsy are significant risk factors for the recurrence of febrile seizures and for the development of epilepsy.

Keywords: Febrile seizures; Tobruk; Libya; knowledge; Tobruk Medical Center.

Introduction

The American Academy of Pediatrics published a clinical practice guideline defining a febrile seizure as "a seizure that occurs between the age of 6 and 60 months with a temperature of 38 °C (100.4 °F) or higher, that is not the result of central nervous system infection or any metabolic imbalance, and that occurs in the absence of a history of prior afebrile seizures"[1, 2].

It is divided into simple febrile seizures and complex febrile seizures[3]. A simple febrile seizure is a generalized, usually tonic-clonic, lasting for a maximum of 15 min, and not recurrent within a 24-hour period. A complex febrile seizure is more

prolonged (>15 min), is focal, and/or reoccurs within 24 hours[2]. Rarely, Postictal drowsiness occurs for a brief period[4].

Differentiation between simple and complex febrile seizures is important as the approach and work-up for each is different[5]. More than 90% of febrile seizure are simple[2, 6], Between 9% and 35% of all first febrile seizure are complex[7]. Febrile status

epilepticus develops in 1-2% of children with febrile seizures[8].

The exact causes of febrile seizure are still unknown. However, some studies indicate a possible association with environmental and genetic factors[9]. Cytokines network activation may have a causative role[10]. Some other studies reveal the occurrence of febrile seizures due to a neuronal tendency of immature brains to depolarize and fire spontaneously[4].

A febrile seizure is usually very frightening for parents to watch; may think that their child is dying. Parents need to be reassured that the seizure is not harmful and will not cause brain damage[3].

Risk factors for recurrence of febrile seizure are male gender, a family history of febrile seizure, an elevated peak body temperature, certain underlying causes of the fever, prenatal and natal complications, low serum calcium, sodium or blood sugar, iron deficiency anemia, zinc deficiencies[9], daycare, duration of fever 24 hours and age 1 year[2]. Some studies show increased Von Willebrand factor parameters in children with febrile seizures[11].

Risk factors for the occurrence of subsequent epilepsy after febrile seizure in the literature include a family history of epilepsy, neurodevelopmental abnormality, complex febrile seizure, and short fever interval before a seizure (1 HR)[12], recurrent febrile seizure[2]. The risk of epilepsy after febrile seizures increased between 3% to 7% compared with nearly 0.5% of the general population, which makes febrile seizures a significant health problem[13].

Febrile seizures are benign[14], self-limiting[15], it is also a major challenge in pediatric practice because of its high incidence in young children and its tendency to recur[16]. Febrile seizure recurs in approximately 25–50% of children with febrile seizures[12].

Incidence and prevalence of febrile seizures are thought to vary depending on geographic, socioeconomic variations, and genetic disposition[12]. The overall prevalence of febrile seizures between 2% and 5% of children[17, 18]. The peak age of onset is 18 months[9]. The concordance rate is about 35–69% and 14–20% in monozygotic twins and dizygotic twins, respectively[16].

Children of all ethnic groups may present with febrile seizures, but there is a higher prevalence in some ethnic groups, in particular Guamanians

(14%), Japanese (6%–9%), and Indians (5%–10%)[4]. In Western Europe and the United States prevalence of 2%–5%[9]. In Africa, studies on the frequency of febrile seizures vary according to the studies from Yaoundé (6.1%), Nigeria (3.5%), and the Congo (1.4%)[17]. A frequency of 10% febrile seizure was noted in the offspring of families with febrile seizures[4]. Male children have a double chance of febrile seizures compared to female children[4].

A febrile seizure is more common in children belonging to a lower socioeconomic status, probably because of inadequate access to medical care. Seasonal and diurnal variations in the occurrence of febrile seizures have been detected by researchers in the United States, Finland, and Japan. Basically, the preponderance of febrile seizures occurs in the winter months and in the afternoon[16].

The viral infection is the cause of fever in about 80% of cases of febrile seizures[16]. Acute respiratory illnesses are most commonly associated with febrile seizures[6]. Human herpes virus-6 (HHV-6) and influenza infections are mainly reported cause of febrile seizures due to high fever during these infections[19]. Tooth infections, and gastroenteritis[9]. Urinary tract infections and Roseola infantum are less common causes[6]. There is an increased risk of occurrence of febrile seizures after vaccination mainly MMRV[20].

Febrile seizures should be differentiated from other causes of seizures like shaking chills, febrile delirium, breath-holding spells, Central Nervous System infection, febrile myoclonus, generalized/genetic epilepsy with febrile seizures plus, new-onset refractory status epilepticus, and febrile infection-related epilepsy syndrome[16].

No further workup is necessary for simple febrile seizures[6], in a neurologically intact child who appears well, has a normal neurological examination, is fully immunized, and has no meningeal signs, So neuroimaging and electroencephalography are not routinely recommended[21], and do not require routine diagnostic laboratory testing, except as indicated to discern the cause of the fever[22].

For febrile seizures lasting more than five minutes, a benzodiazepine should be given. For children

with complex seizures, the full neurological examination should guide further management. The routine use of antiepileptics not recommended because of the adverse effects of these medications. The use of antipyretics does not decrease the risk of febrile seizures[6], although rectal acetaminophen reduced the risk of short-term recurrence following a febrile seizure[22]. Although febrile seizures have an excellent prognosis, they are also a source of anxiety for both parents and family members, and so it is, therefore, important to determine the exact incidence and recurrence rates[15]. There are no cognitive adverse effects of having febrile seizures. These patients do not have any increased risk of abnormalities of attitude, attention, or school performance compared with age-matched controls[13].

AIM OF STUDY

- 1 -To detect the incidence and causes of febrile seizures.
- 2 -To find out the correlation between febrile seizure and Age at admission, gender, recurrence, mode of delivery, cause of fever, family history of febrile seizure, and family history of epilepsy.

PATIENT AND METHODS

This is an observational organized prospective clinical study; this study was carried out at the pediatric department of Tobruk medical center, which is one of the tertiary care governmental teaching hospitals located in the Tobruk city in northeastern Libya.

From January 1, 2018, to December 31, 2018. This hospital has a 450-bed capacities and provides health care services for the area from 150 km to the east to 75 km to the west and 300 km to the south. All cases of febrile seizure examined in private clinics were transferred to the Tobruk medical center and included in this study.

The total number of children admitted to the Pediatric ward in 2018 was 3332 of which 235 were diagnosed as Febrile Seizure. Data were collected using a well-prepared structured pretestedquestionnaire included (age at admission, gender, recurrence, mode of delivery, cause of fever, family history of febrile seizures, and family history of epilepsy).

ENROLLMENT CRITERIA

Inclusion criteria

- 1 - All children of age group 6 to 60 months with febrile seizures.
- 2 - Fever of 38 degrees Celsius or higher.

Exclusion criteria

- 1 - Children with metabolic disorders.
- 2 - Children with previous afebrile seizures.
- 3 - Children with central nervous system diseases and infections.

RESULTS

All next tables and figures show the relationship between febrile seizure and the following parameters:

Table 01:Age distribution

Age	No of cases	%
≥6 to ≤12 months	57	24.3
>12 to ≤24 months	95	40.4
>24 to ≤36months	46	19.6
>36 to ≤48 months	21	8.9
>48 to ≤60 months	16	6.8
Target group	235	100

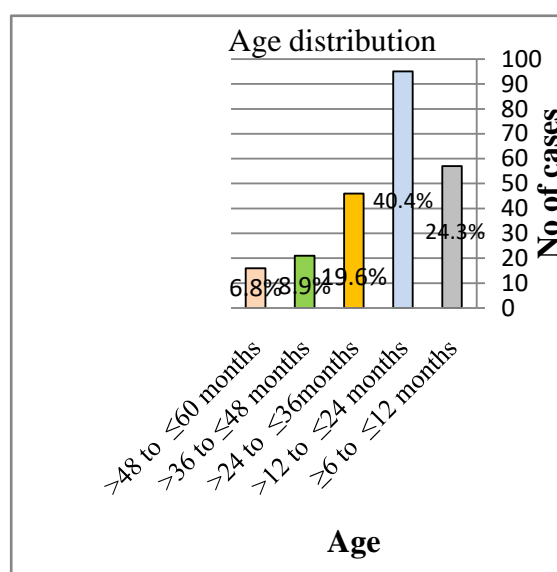


Figure 01 : Age distribution

Table 02: Gender distribution

Gender	No of cases	%
Male	142	60.4
Female	93	39.6
Target group	235	100

Figure 02: Gender distribution

Table 03: Mode of delivery

Mode of delivery	No of cases	%
Spontaneous vaginal delivery	144	61.3
Inducing vaginal delivery	52	22.1
Cesarean section	39	16.6
Target group	235	100

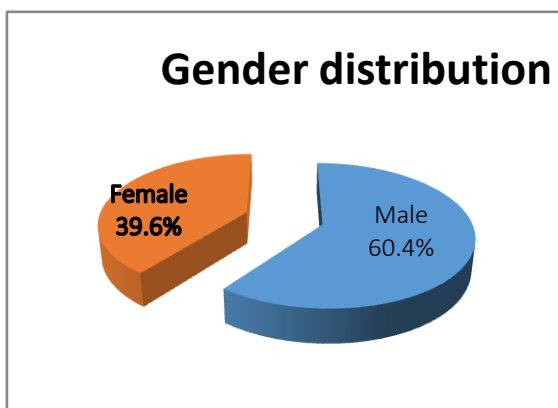


Figure 03 :Mode of delivery

Table 04: Cause of fever

Focus	No of cases	%
Respiratory tract infection	174	74
Urinary tract infection	11	4.7
Roseola	6	2.6
Gastroenteritis	32	13.6
Other infection	12	5.1
Target group	235	100

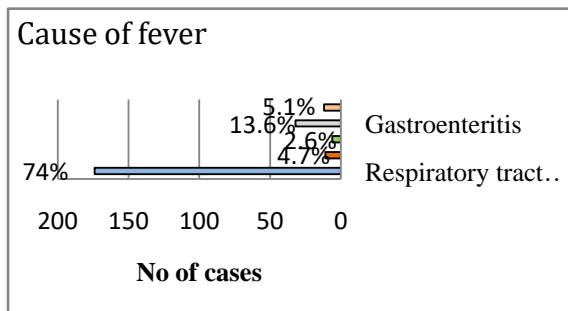


Figure 04 :Cause of fever

Table 5: Family history of febrile seizures

Family history of the febrile seizures	No of cases	%
Yes	56	23.8
No	179	76.2
Target group	235	100

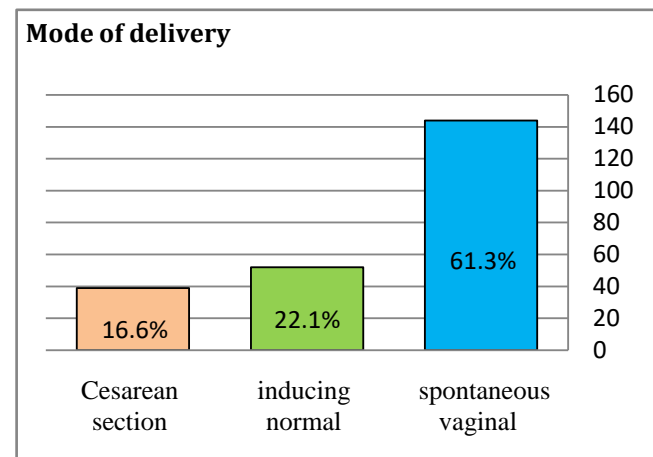


Figure 05:Family history of febrile seizures

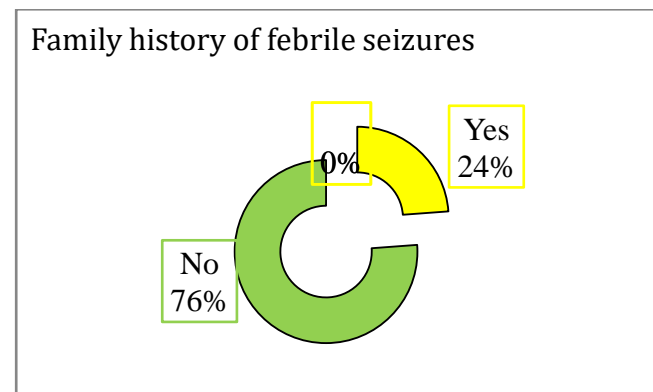


Figure 05:Family history of febrile seizures

Table 06: Family history of epilepsy

Family history of epilepsy	No of cases	%
Yes	27	11.5
No	208	88.5
Target group	235	100

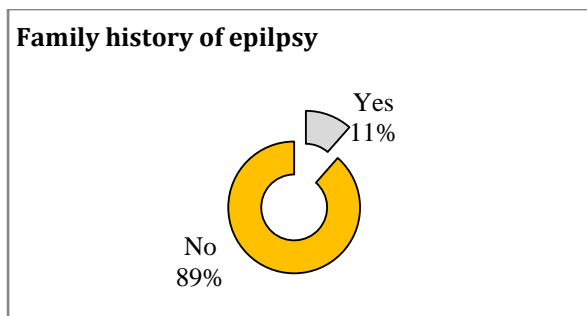


Figure 06: Family history of epilepsy

Table 07: Recurrence febrile seizure

Attach	No of cases	%
1st	208	88.5
2nd	17	7.2
3rd	7	3
> 3 attach	3	1.3
Target group	235	100

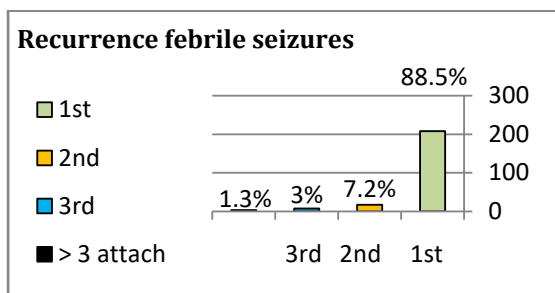


Figure 07 : Recurrence febrile seizures

Table 08: Incidence of patients with febrile seizures in 2018

Diagnosis	No of cases	%
Febrile seizures	235	7
Others	3097	93
Target group	3332	100

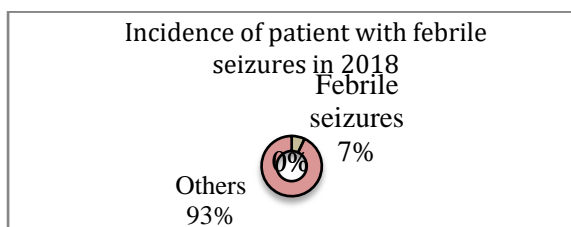


Figure 08: Incidence of patient with febrile seizures in 2018

DISCUSSION

Almost all patients with febrile seizures who are reviewing the pediatric department at Tobruk Medical Center, (7 %) of total admission in the Pediatric 2018 were diagnosed as Febrile Seizures,

which appear higher than the United States and Western Europe rate (2% to 5%)[2, 16, 22, 23], concomitant with the rate of 6%–9% in Japanese children, and 5%–10% in Indian children[9, 16] and In Africa, studies on the frequency of febrile seizures vary according to the reports from Yaoundé (6.1%), Nigeria (3.5%) and the Congo (1.4%) [17].

Our study shows that (40.4 %) of cases diagnosed as febrile seizures occur in the second year of life which consider as the peak age of incidence; this comes into agreement with Kaboré, A., et al. Ghosh, N.K., et al that conducts studies showing (38.7%) (39 %) respectively, of cases of febrile seizures, were recorded in children from 12 to 24 months[17, 24] and concomitant with Ganie, N.A., et al. that said, the (62 %) of cases occur in children from 1 to 2 years old which represents the peak age of incidence, this high percent more likely because the small sample is taken by researchers 50 patients[25].

Males predominated was clear in the present study with the male-female ratio of (1.53:1). This was similar to the gender ratio ranging from (1.63:1) as reported by two studies Ganie et al and Saqib, N. et al.[23, 25], also agreed with Shibeeb, N. et al that gives male to female ratio of 1.7:1.[7]and not agreed with Khalaf et al. that said the male to female ratio 1:1.14 was almost equal due to his sample small in size 30 patients[1].

In this study (61.3%) was delivered by spontaneous vaginal delivery, (22.15 %) by inducing vaginal delivery and (16.6%) by cesarean section; no other study is available for comparison.

Our study revealed that simple febrile seizures were more common than complex febrile seizures in all children between 6 months & 60 months of age (85.5% vs. 14.5%); this comes into agreement with Ganie et al., whose conducted a studies which showed almost same result (82% vs. 18%) [26] and Leung, A.K.et al, that mentions Simple febrile seizures account for about 80–85% of all febrile seizures[16]and not fully agreed with Ghosh, N.K., et al with same finding but percent different less than our study (66% vs. 34%)[24], this due to the small sample used 59 patients.

Our study demonstrates that respiratory tract infection is the main cause of fever in patients with febrile seizures (74%); this comes into agreement with Canpolat, M., et al, who conducted a study

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