Research Article
CODEN (USA): IJPLCP

ISSN: 0976-7126
Otman & Saed, 11(8):6914-6920, 2020

International Journal of Pharmacy & Life Sciences
Open Access to Researcher

Febrile seizures: What do you want to know?

Muftah A. Otman* and Mohamad M. Saed

Pediatric Sciences Department, Faculty of Human Medicine, University of Tobruk, Libya

Article info

Received: 06/07/2020

Revised: 24/07/2020

Accepted: 27/08/2020

© IJPLS

www.ijplsjournal.com

Abstract

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. To detect the incidence, causes of febrile seizures and to find out the correlation between febrile seizures and certain parameters. 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. 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. 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].

***Corresponding Author**
E.mail: muftah.otman@tu.edu.ly

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, neuro developmentalabnormality, 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, febrilemyoclonus, 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

ISSN: 0976-7126
Otman & Saed, 11(8):6914-6920, 2020

children with complex seizures, the full neurological examination should guide further management. The routine use of antiepilepticsis 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

- To detect the incidence and causes of febrile seizures.
- 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 pretested questionnaire 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:

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

Exclusion criteria:

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

Results and Discussion

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

Table 1: 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 1 : Age distribution

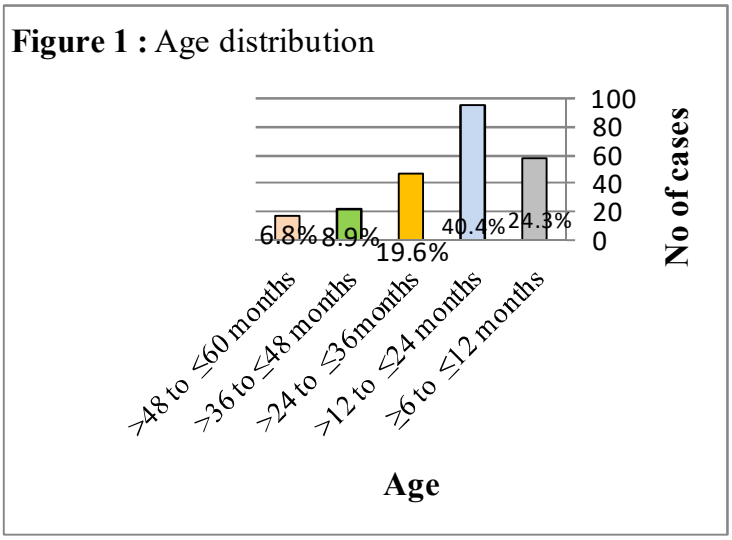


Table 2: Gender distribution

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

ISSN: 0976-7126
Otman & Saed, 11(8):6914-6920, 2020

Figure 2: Gender distribution

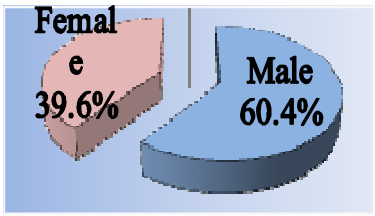


Table 3: Mode of delivery

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 3 : Mode of delivery

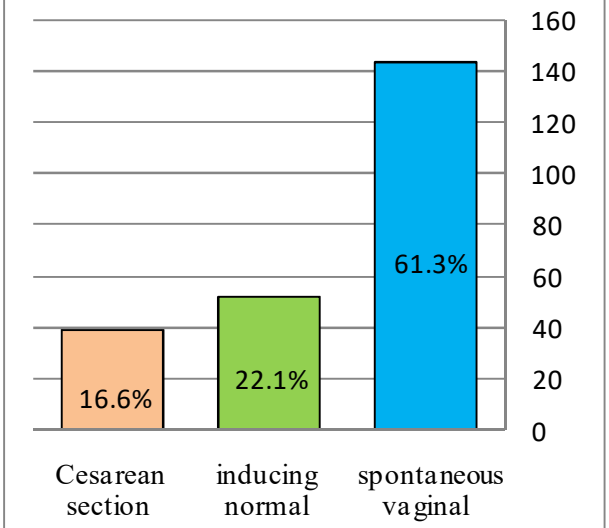


Table 4: Cause of fever

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 4 : Cause of fever

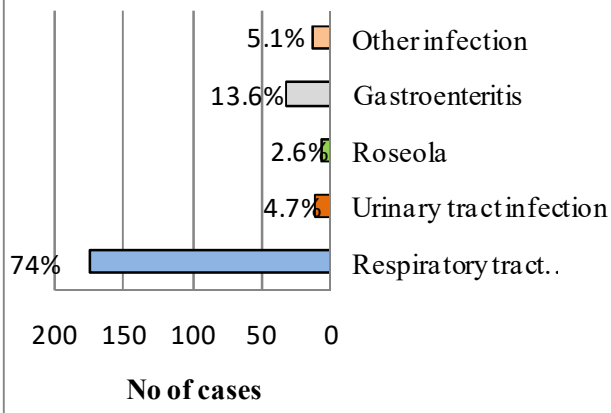


Table 5: Family history of febrile seizures

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

Figure 5: Family history of febrile seizures

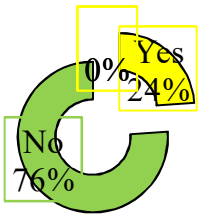


Table 6: Family history of epilepsy

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

ISSN: 0976-7126
Otman & Saed, 11(8):6914-6920, 2020

Figure 6: Family history of epilpsy

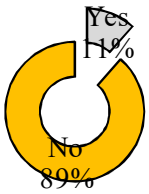


Table 7: Recurrence febrile seizure

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 7 : Recurrence febrile seizures

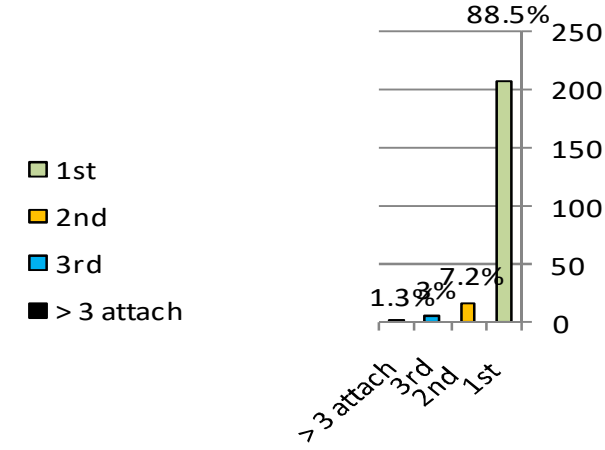
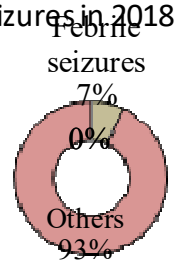


Table 8: Incidence of patients with febrile seizures in 2018

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

Figure 8: Incidence of patient with febrile seizures in 2018



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.

ISSN: 0976-7126
Otman & Saed, 11(8):6914-6920, 2020

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 that showed nearly almost the same cause in (75.3 %) of the patient[12].

In addition, the number of episodes experienced by parents was for the first time in (88.5%) of the cases and (11.5%) had more than one attack; this result is compatible to study done by Elbilgahy et al, that dissects nearly exact result (82.2%) for the first time and (17.8 %) for more than one attack[27] and not agree with Shibeeb et al, that shows the number of episodes experienced by parents was for the first time in (69%) of the cases and (31%) had more than one attack[7], these differences may be explained by the lack of information in the recording of cases which could be due to the failure of parents to describe or recognize the fit in later study. Write In this research (24%) of the patient had a family history of febrile seizures, which compatible with Khalaf, D.K et al, that is said (25 %) of the patient had a family history of febrile seizures[1] and is higher than Saqib et al; that exhibit much less percent (10 %) of the patient had a family history of febrile seizures[23], most likely because of geographical, ethnic, genetic factors.

Write here. In this study (11 %) of the patient had a family history of epilepsy which appear less than other studies Carman, K.B., et al., that said (18 %) had a family history of epilepsy[19] and Abzug, M.J., et al. that said the risk of epilepsy after febrile seizures is still only in the range of 15– 20%, although it is increased if more than one risk factor are there[6].

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.

Ethical Consideration

The study protocol was approved by the ethics committee of the scientific research in Tobruk University and Tobruk medical center. All parents of children with febrile seizures were informed about the research and gave oral consent. No parent refused our aim for this study.

Acknowledgments

We highly appreciate the help of Dr. Ahmed Gouda Youssef; Dr. Ayman Salah Eldin Abdul Salam ; Dr. Khalid Elmahdy, Statistical Department of Tobruk medical center.

References

1. Khalaf, D.K., Y.K. Al-Rawi, and M.S. Abdulrahman, Relationships between serum electrolytes and febrile seizure. The Pharma Innovation Journal 2018; 7(8): 227-23
2. Kliegman, R., et al., Febrile Seizures. Nelson Textbook of Pediatrics, 2019; 611.1(21):p.12071-12079.
3. El-Radhi, A.S., PaediatricSymptom and Sign Sorter. CRC Press,2019;(2);p240
4. Maheshwari, N., et al., Febrile Seizure. The Professional Medical Journal, 2018; 25(03): p. 461-465.
5. Xixis, K.L. and M. Keenaghan, Febrile Seizure, in StatPearls. 2019;
6. https://www.ncbi.nlm.nih.gov/books/NBK448123/#_NBK448123_pubdet_
7. Abzug, M.J., et al., Febrile Seizures. Current diagnosis & treatment : Pediatrics. 2018;9(23):p697-698
8. Shibeeb, N.F. and Y.A.S. Altufaily, Parental knowledge and practice regarding febrile seizure in their children. Medical Journal of Babylon, 2019. 16(1): p. 58-64.
9. Baran, G. andE. Turan, Investigation of the effect of the training on fever and febrile convulsion management given to pediatric nurses on their knowledge level. International Journal of Caring Sciences, 2018. 11(1): p. 478.487.

10. Laino, D., E. Mencaroni, and S. Esposito, Management of Pediatric Febrile Seizures. International journal of environmental research and public health, 2018. 15(10): p. 2232.
11. Şahin, S., et al., Reduced cerebrospinal fluid levels of interleukin-10 in children with febrile seizures. Seizure, 2019. 65: p. 94-97.
12. Pechmann, A., et al., Increased von Willebrand factor parameters in children with febrile seizures. PloS one, 2019. 14(1).
13. Canpolat, M., et al., Investigating the prevalence of febrile convulsion in Kayseri, Turkey: An assessment of the risk factors for recurrence of febrile convulsion and for development of epilepsy. Seizure, 2018. 55: p. 36-47.
14. Ateşoğlu, M., et al., Prevalence of Febrile Seizures in School-Aged Children: A Community Based Survey in Izmir, Turkey.J Pediatr Res,Orginal article 2018.5(4):p208-213
15. Vezzani, A. and T. Bartfai, Febrile Response and Seizures, in Stress: Physiology, Biochemistry, and Pathology. 2019, Elsevier. p. 403-411.
16. Byeon, J.H., G.-H. Kim, and B.-L. Eun, Prevalence, incidence, and recurrence of febrile seizures in Koreanchildren based on national registry data. Journal of Clinical Neurology, 2018. 14(1): p. 43-47.
17. Leung, A.K., K.L. Hon, and T.N. Leung, Febrile seizures: an overview. Drugs in context, 2018;7:212536 p1-12
18. Kaboré, A., et al., Febrile Convulsions in Infants atthe Pediatrics University Hospital Center Charles de Gaulle of Ouagadougou (Burkina Faso). Open Journal of Pediatrics, 2018. 8(2): p. 199-206.
19. Yau, M., K. Hon, and C. Cheng, Febrile seizures in children: a condensed update. Hong Kong Medical Journal =Xianggang yi xue za zhi, 2019. 25(6): p. 499-500.
20. Carman, K.B., et al., Viral etiological causes of febrile seizures for respiratory pathogens (EFES Study). Human vaccines & immunotherapeutics, 2019. 15(2): p. 496-502.
21. Gvozdenovic, E., et al., Impact of history of febrile convulsions on the risk difference of febrile convulsions with the tetravalent measles–mumps–rubella–varicella vaccine: Post-hoc exploratory analysis of results from a matched-cohort study. Vaccine, 2018. 36(39): p. 5803-5806.
22. Harriet Lane, S., H. Hughes, and L. Kahl,Febrile illness–associated seizures The Harriet Lane handbook : a manual for pediatric house officers. 2018.60(21)p555-556
23. Smith, D.K., K.P. Sadler, and M. Benedum, Febrile Seizures: Risks, Evaluation, and Prognosis. American family physician, 2019. 99(7) :p. 445-450.
24. Saqib, N. and M. Qazi, Association between serum zinc level and simple febrile seizures in children: a hospital-based study. International Journal of Research in Medical Sciences, 2018. 6(9): p. 3116.
25. Ghosh, N.K., et al., Association between serum zinc level and simple febrile seizures in children: a hospital-based study. International Journal of Research in Medical Sciences. 2018;6(9):3116-3119.
26. Ganie, N.A., et al., Is there a need for routine screening and treatment of iron deficiency anemia in early childhood to decrease incidence of febrile seizures? Innovative Journal of Medical and Health Science, 2018. 8(7): p. 94-101.
27. Nisar Ahmad Ganie, Is there a need for routine screening and treatment of iron deficiency anemia in early childhood to decrease incidence of febrile seizures? Innovative Journal of Medical and Health Science, 2018. 8(7):p94-101

Cite this article as:
Otman M.A and Saed M. M. (2020). Febrile seizers: What do you want to know? , *Int. J. of Pharm. & Life Sci.*, 11(8): 6914-6920.
Source of Support: Nil
Conflict of Interest: Not declared
For reprints contact: ijplsjournal@gmail.com