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THE CLINICAL CHARACTERISTICS OF FEBRILE SEIZURE AMONG LESS THAN FIVE-A CASE SERIES STUDY CONDUCTED IN MOSUL-IRAQ

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ABSTRACT

Background: Children between the ages of six months and five years old are commonly affected by febrile seizures which is the most prevalent kind of seizure among this age group. Dealing with children who have febrile seizures at the emergency department raises the following challenges: considering whether the fever is caused by an acute symptomatic disease like bacterial meningitis or encephalitis/encephalopathy, if the seizure is the first triggered seizure of epilepsy, or if it may progress to epilepsy later, and if there is a possibility of recurrent seizure during the febrile illness. **Objectives:** To assess the clinical characteristics of febrile seizure among less than five years in Mosul province-Iraq. **Methods:** A case series study was carried out at Ibn Al Atheer Teaching Hospitals in Mosul, Iraq, from March 2024 until the end of March 2025. The study included seventy-two children aged eighth mouths to five years with convulsion that were suggested to be febrile in nature depending on the following criteria; their ages were between six months-five years, the presence of high fever (more than 39°C) and absence of signs of central nervous system (CNS) infection by a normal CSF finding. The questionnaire includes three parts; part one for socio-demographic information. Part two for details of seizure. Part three for associated clinical presentation. **Results:** Among 72 patients enrolled in the study, 41 (56.6%) subjects were male and 31 (43.1%) subjects were females with male to female ratio of 1.32:1. Statistically significant difference (P-Value = 0.021) was found regarding the patients' residency with more patient reside in urban area. Thirty-four (47.2%) subjects in this study, were aged between 12-24 months, followed by 27 (38.8%) subjects were aged between 24-60 months and lastly; 11 (14%) subjects were aged less than 12 months. Statistically significant differences regarding seizure duration, type of seizure and family history of febrile seizure (P-Value <0.001) of all of them. Lastly; the most frequent underlying cause for febrile seizure is upper respiratory tract infection followed by pneumonia and gastroenteritis. **Conclusion:** Febrile seizure is a frequent problem in Mosul city. It's more frequently found among children with age group 1-2years. There was no sex difference and most of febrile seizure is simple type. Positive family history of febrile seizure is found to have a significant role in the possibility of occurrence of febrile seizure.

KEYWORDS: Fever, Convulsion, Mosul, Iraq.

1- INTRODUCTION

Children between the ages of six months and five years old are commonly affected by febrile seizures (FS) which is the most prevalent kind of seizure among this age group.[1-2] Febrile seizures are often self-limiting and do not require special treatment. However, parents may be concerned when their healthy child experiences such an episode.[3] Parents who have seen FS many times may acquire "fever phobia."[4] Dealing with children who have FS at the emergency department (ED) raises the following challenges: considering whether the fever is caused by an acute symptomatic disease like bacterial meningitis or encephalitis/encephalopathy, if the seizure is the first triggered seizure of epilepsy, or if it may progress to epilepsy later, and if there is a possibility of recurrent seizure during the febrile illness.[5]

If a seizure is focused, lasts longer than 10-15 minutes, or occurs many times within a 24-hour period, healthcare practitioners may need a more thorough evaluation.[6] Hospitalization and neurodiagnostic testing may be part of this evaluation. However, recent studies indicate that neuroimaging, urgent electroencephalography (EEG), and regular lumbar puncture (LP) offer poor diagnostic results.[7-8] The American Academy of Pediatrics (AAP) guidelines for treating simple febrile seizures (SFS) considered a reduction in unnecessary diagnostic testing, hospitalizations, and costs. But, with no delay in bacterial meningitis diagnosis.[9] Since the introduction of *Hemophilus influenzae* type b and *pneumococcal* vaccinations, bacterial meningitis has been found in 0.3% to 0.7% of FS patients. As a result; invasive procedures, such as LP, should be done cautiously for children with special indication, for example complex febrile seizure (CFS).[10] Testing for intracranial abnormalities in CFS patients is unnecessary unless abnormalities or localized findings are discovered during neurological examination.[11] Patients with CFS have an estimated 2% and 10% chance of developing future seizures.[12] This risk increases with focal seizure features and longer seizure durations.[13] On the other hand, the probability of developing epilepsy later on is the lowest when FS recurs within a 24-hour period.[14] Interictal EEG is not a reliable predictor of FS and does not help with its acute treatment.[15] The current study was conducted to assess the clinical characteristics of febrile seizure among less than five years in Mosul province-Iraq.

2-PATIENTS AND METHODS

Following permission from the Nineveh Health Directorate's ethical committee. From March 2024 until the end of March 2025, a case series study was carried out at Ibn Al Atheer Teaching Hospitals in Mosul, Iraq. The study included seventy-two children aged eighth mouths to five years with convulsion that were suggested to be febrile in nature depending on the following criteria; their ages were between six months-five years, the presence of high fever (more than 39°C) and absence of signs of central nervous system (CNS) infection by a normal CSF finding.

Each of these patients was studied for the following: age, sex, and residence, number, type and duration of convulsion. Associated symptoms: like cough, ear discharge, rash, vomiting, diarrhea, dysuria; and family history. The investigations that were done included LP for children if they were, under 2 years of age or having doubtful CNS infection. Other investigations that were indicated for some of them included Chest X-ray, General Urine examination, Random Blood Sugar, and Serum calcium in those with prolonged seizure.

Statistically analysis done by using SPSS 30.0 software application. To compare the means, Chi square and Student's t-test were employed. The p-value was considered statistically significant if it was less than 0.05.

3. RESULTS

Among 72 patients enrolled in the study, 41 (56.6%) subjects were male and 31 (43.1%) subjects were females with male to female ratio of 1.32:1. Statistically significant difference (P-Value = 0.021) was found regarding the patients' residency with more patient reside in urban area. As shown in table 3.1.

Table 3.1: Distribution of the study participants according to their basic information.

Variable	Number	Percent	P- Value
Patient's sex:			
-Male	41	56.9 %	0.341
-Female	31	43.1 %	
Patient's residence:			
-Urban	48	66.5%	**0.021**
-Rural	24	33.5%	
Patient's age (months):			
-Mean ± Standard deviation	33.6 ± 11.76		
-Median ± Interquartile range	35 (8-54)		
Male to female ratio	1.32:1		

Thirty-four (47.2%) subjects in this study, were aged between 12-24 months, followed by 27 (38.8%) subjects were aged between 24-60 months and lastly; 11 (14%) subjects were aged less than 12 months. As shown in figure 3.1.

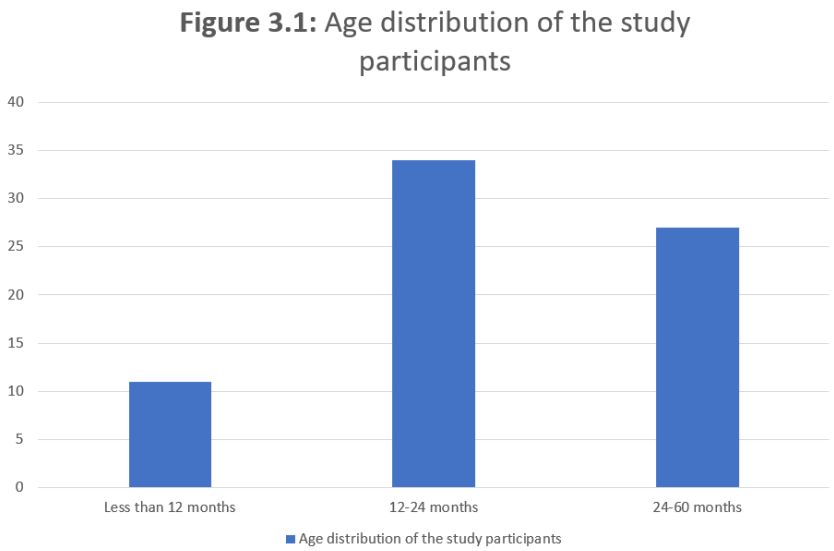

Table 3.2 shows the clinical characteristics of the study participants. Statistically significant differences (P-Value <0.001) regarding seizure duration, type of seizure and family history of febrile seizure.

Table 3.2: Distribution of the study participants according to their clinical characteristics.

Clinical Characteristics	Number (Percent)	P-Value
Seizure duration: - Less than 15 minutes - More than 15 minutes	 60 (83.4%) 12 (16.6%)	**<0.001**
Type of Seizure: -Generalized -Focal	 71 (98.6%) 1 (1.4%)	**<0.001**
Positive family history: - Positive - Negative	 27 (37.5%) 45 (62.5%)	**<0.001**

Table 3.3 shows the clinical presentation of children with febrile seizure, the most frequent underlying cause for febrile seizure is upper respiratory tract infection followed by pneumonia and gastroenteritis.

Clinical presentation	Number (Percent)
Upper respiratory tract infection	52 (72.2%)
Pneumonia	14 (19.4%)
Gastroenteritis	5 (7.0%)
Urinary tract infection	1 (1.4%)

4. DISCUSSION

Febrile seizures are the most prevalent neurological disorders in children aged six months to five years. They are induced by a rapid rise in body temperature.[16] It's evident that at least one episode of febrile seizure occurred in 2-5% of children during their childhood.[17]

This study found that no significant difference between sex regarding the presence of febrile seizure in spite of there was slight male predominance. Comparable findings obtained from Riyadh Abdulatif Al-Obeidi[18] and Sabah Hassan Alatwani et al.[19] But inconsistent with Hailah Othman Habeeb et al who showed sex significant difference, anyhow; small sample size and different study setting were the reason for such a difference.[20]

On the other hand; urban residence was found in this study to be significantly linked to febrile seizure, as parents with higher education levels and living in urban areas may have better orientation for febrile seizures, but this doesn't necessarily mean that urban residents are more likely to experience them. Awayi Ghazy Abdulkareem had closed results.[21]

This study found that about half of the study participants were aged between 1-2 years, as the developing brain of these children is more sensitive to fever and has a low threshold level for seizure attacks. Which is runs with Aakriti Tiwari study findings.[16]

Febrile convulsion was shown in this study of simple and generalized type in most of the patients, which is

consistent to Ram Prasad Pokhrel et al finding.[22] Moreover; 37.5% of the study participants showed positive family history of febrile seizure, as a positive family history can increase the risk of febrile seizures by a significant margin, and this suggests a strong genetic component to febrile seizures, with certain families having a higher predisposition to them, comparable findings was obtained by Hailah Othman Habeeb.[20] and Riyadh Abdulatif Al-Obeidi.[18]

Febrile convulsion was presented in this study with upper respiratory tract infection followed by pneumonia and gastroenteritis, this finding is going with 1 L. Chairman Muthu Prem Kumar et al[23] and Mohamed El-Sayed Hamed et al[24] studies' findings.

5. CONCLUSION

Febrile seizure is a frequent problem in Mosul city. It's more frequently found among children with age group 1-2years. There was no sex difference and most of febrile seizure is simple type. Positive family history of febrile seizure is found to have a significant role in the possibility of occurrence of febrile seizure.

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Conflict of intertest

About this study, the authors disclose no conflicts of interest.

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