

INFECTIOUS CAUSES ASSOCIATED WITH FEBRILE SEIZURE IN CHILDREN: SINGLE CENTER EXPERIENCE:

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Abstract- Objective: To establish the infectious causes associated with the increase in temperature in patient with febrile convulsion admitted to the Prince Hashem Hospital and its association with the season.

Methods: Retrospective study, including all children hospitalized with the diagnosis of febrile convulsion from February 2007 through February 2009.

Results: We included 88 patients. Infectious diarrhea was the most common cause of fever (43%), followed by acute pharyngitis (36%), and bronchopneumonia (5%). Less common causes were; cellulitis, urinary tract infection and post-vaccination reactions in a small number of cases. In our study, winter time is more commonly associated with infectious disease outbreaks of gastrointestinal and respiratory infections (42%), followed by summer season (24%).

Conclusions: Gastrointestinal and upper respiratory tract infections were the most common causes of elevated temperature and subsequent febrile seizure. The epidemics of respiratory and diarrheal infections in winter season resulted in increasing the incidence of this disease.

Key words: Convulsion, Diarrhea, Febrile seizure.

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I. INTRODUCTION:

Seizures in the setting of fever may be caused by infections of the nervous system; meningitis, encephalitis, or brain abscess, unrecognized epilepsy triggered by fever, and simple febrile seizure. The latter represents a common genetic predisposition to seizures in children between 6 months and 5 years that is precipitated by fever. Febrile convulsions occur in 2% to 4% of children; most occur between ages 1 and 2 years with mean age of 22 months [1]. Simple are generalized major motor seizures lasting less than 15 minutes that occur only once in a 24-hour period in a neurologically and developmentally normal child.

If there are focal features, the seizures last longer than 15 minutes, the child has preexisting neurologic challenges, or the seizures occur multiple times within one event, the seizure is referred to as a complex or atypical seizure [1-3]. Febrile seizures are usually benign but can cause fear to the parents. The pathophysiology of this base still uncertain, but clearly genetic predisposition contributes to the occurrence of this disease. This is supported by genetic linkage studies of several families in which the gene was located in 19p and 8q locus of chromosome 13 and 21, showing in some families an autosomal dominant inheritance pattern [4, 5]. Any event capable of producing fever is potentially a risk factor for a febrile seizure in a predisposed patient. In the literature there are some studies and case reports that found a specific association of herpes virus 6 infections with febrile seizures

[6, 7], but no studies generally show which are the infectious more commonly associated with febrile seizures. We believe it is important to try to find an association and precedence over the fever infection can produce potentially febrile seizures. We tried to realize this aim in our study.

II. MATERIAL AND METHODS

We performed a retrospective, and descriptive study, reviewing files of all patients admitted to Pediatric Ward in Prince Hashem Hospital with a diagnosis of febrile seizure (simple or complex) between the ages of 6 months to 5 years during the period from February 2007 to February 2009. Work up of the patients included: one blood cultures, chest radiograph, blood count, C reactive protein, urinalysis and culture, stool analysis and culture and lumbar puncture if it was clinically indicated. Additional studies such as Brain CT scan, EEG and others are requested if indicated to rule out other diagnostic possibilities.

We excluded those patients who during hospitalization the diagnosis of febrile seizures were changed and those who had more than two infectious processes capable of raising the temperature.

Patients were classified according to age in three age groups: younger infants (6 to 12 months of age), older infants (12 to 24 months of age) and the group of preschoolers (2 to 5 years of age). Depending on the season, patients were classified into those admitted in winter (December 22 to March 21), spring (March 22 to June 21), summer (June 22 to 21 September) and

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autumn (September 22 to December 21). We depend in our statistics on simple tabulation of our results.

III. RESULTS

The work was carried out with 94 patients. Six patients were excluded: two final diagnosis of epilepsy, one with meningitis, two by having two infectious diagnoses and the last for failure to comply with all the studies planned for the work. In relation to gender: 36 (41%) were female and 52 (59%) male. The most affected age group corresponding to 1 to 2 years with 38 (43%) cases, followed by the group of 2 to 5 years with 30 (34%) cases, ending with the group of 6 months to 1 year in 23% (20 cases). We found that the season with highest number of cases was winter with 37 (42%), followed by summer with 21 (24%), While it was 19% (17 cases) and 15% (13 cases) in spring and autumn respectively. Family history of febrile seizures was present in 14 cases (16%).

The diagnoses as a cause of fever were: gastroenteritis in 38 (43%), of which 13 attributed to viral, 8 to Giardia, 4 Amebiasis and 13 cases without finding etiology. Acute pharyngitis was the second leading cause of febrile seizure in 32 (36%) patients. Bronchopneumonia in 4 cases (5%), 3 (4%) patients seizures within 24 hours after they had received a vaccine. 2 patients with cellulitis and one urinary tract infection. In 8 cases no infectious cause had been isolated (table 1). The etiology of the infectious process according to the season was found during the winter, respiratory tract infection were 51% (19 patients) of cases followed by diarrheal in 32% (12 patients) of cases, during the summer and spring seasons, the most prevalent cause was the gastroenteritis with 52% and 70% of cases respectively.

IV. DISCUSSION

Febrile convulsions occur in 2-4% of children, although the incidence in Jordan is not known, it is evident that febrile convulsions account for a significant proportion of morbidity and hospital admissions. The study showed predominance in males which is compatible with the worldwide literature [3]. Season with the highest incidence of febrile seizures is winter followed by summer; they were associated with the outbreak of infectious respiratory and diarrheal respectively. The clinical and laboratory analysis showed that the most common cause of elevated temperature processes are infectious diarrheal disease. A sixteen percent of our patients had an affected first degree relative with febrile convulsions and it is comparable to the available information in the literature [8-11]. In general, the parents did not have adequate knowledge on febrile convulsions highlighting the need for parental health education [12-15]. There is evidence that parents' poor knowledge, negative attitudes, anxiety, and inadequate first-aid measures toward febrile convulsions can be effectively improved by parent education [16, 17]. Febrile seizures are divided into 2 types: simple febrile seizures [which are generalized, last < 15 min and do not recur within 24 h and complex febrile seizures [which are prolonged, recur more than once in 24 h, or are focal [18].

Complex febrile seizures may indicate a more serious disease process, such as meningitis, abscess or encephalitis. Current recommendations include consideration of a lumbar puncture, especially in children younger than 18 months, because meningeal signs are less reliable in this group [19]. The

prevalence of meningitis among patients with a febrile seizure was 1 to 2 percent, which correlate with our study, one out of ninety four patients had meningitis, about 1 percent [20]. In our study, the diagnoses as a cause of fever were: gastroenteritis in 38 (43%) and acute pharyngitis was the second leading cause of febrile seizure in 32 (36%) patients. The etiology of the infectious process according to the season was common during winter; respiratory tract infection was 51% [19 patients] of cases followed by diarrheal in 32% (12 patients) of cases, which correlate with another study done in Iraq [21].

The intention of our study is to generalize the results with what happens in other parts of the country and compare it with the international data trying to show the different variables found, and its association with febrile seizures, which may be useful for better handling and prevention of febrile convulsions.

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Table 1: Diagnosis of Febrile convulsion:

Etiology	No. of patients	%
Acute Pharyngitis	32	36
Bronchopneumonia	4	5
Gastroenteritis	38	43
Post vaccination fever	3	4
Cellulites	2	2
Urinary tract infection	1	1
Unknown cause	8	9