Research Article

Epidemiological Characteristics of Febrile Convulsions in Children Referred to the Pediatric Ward of One of the Educational Hospitals in Birjand in 2015-2020

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INTRODUCTION

Febrile Convulsion (FC) is the most common type of seizure and childhood neurological problem in children, occurring in 2-5% of children between 6-60 months of age, at temperatures above 38°C. This study aimed to investigate and describe Febrile Convulsion's demographic, clinical, and laboratory characteristics in children admitted to the pediatric ward of one of the educational hospitals in Birjand from 2015 to 2020.

Methods: In this cross-sectional study, 589 children with febrile convulsion referred to the pediatric ward of one of the educational hospitals in Birjand from 2015 to 2020 participated. The checklist was completed according to the patients' files. Data were collected in SPSS software (version 16) and analyzed by chi-square and Mann withney U tests at a significance level of α = 0.05.

Results: The mean age and birth weight of the children were 24.16 ± 13.14 months and 3021.82 ± 576.8 g, respectively. The mean hospital stay was 2.14 ± 1.43 days. The majority were in the age group of 1 to 2 years and were male. 21.5% had a family history of Febrile Convulsion. Most patients had simple seizures. There was a statistically relationship between the type of seizure and birth weight and blood calcium levels (p < 0.05). There was no statistically relationship between Type of seizure with the age and sex of the child, type of delivery, history of hospitalization, previous history of Febrile Convulsion and other laboratory markers in children (p > 0.05).

Conclusion: Since most patients with febrile convulsion were in the age group of 1 to 2 years and were male and had a positive family history, it is recommended to be educated about the importance of Febrile Convulsion and the need for prompt referral and additional examinations in health centers.

Keywords: Febrile convulsion, Epidemiology; Birjand; Children
The most complex seizures were in the 2 to 3 years’ age group and the lowest in the age group of more than three years. There was no significant difference in the type of seizure (simple-complex) with age in the studied children \( (p = 0.25) \).

Complex seizures were more common in boys than girls, but this difference was not significant \( (p = 0.43) \).

Most cases of complex seizures were in the fall and spring. But there was no significant difference in the type of seizure with the season of its occurrence \( (p = 0.45) \).

The frequency of seizures was not significant according to the history of hospitalization and previous history of febrile seizures in children with febrile convulsion \( (p > 0.05) \).

The frequency of complex seizures in infants born with a vaginal delivery was significantly higher than in cesarean section \( (p = 0.02) \).

The frequency of complex seizures was higher in infants weighing less than 2500 g than in infants weighing more than 2500 g, but this difference was not significant \( (p = 0.92) \) (Table 2).

Among the laboratory tests performed in children with febrile seizures, only blood calcium was significantly higher in patients with complex FC than in patients with simple FC \( (p = 0.01) \).

Other laboratory tests did not differ significantly between the complex and straightforward FC groups (Table 3).

**DISCUSSION**

The present study, which aimed to determine the epidemiological characteristics of FC, showed that most cases were in the age group of 1 to 2 years and were male.

FC prevalence before six months and after six years is rare, and its highest prevalence has been reported between 14 and 18 months of age [10].

In the studies of Ardabil and Tabriz, the highest prevalence of FC in the second year of life [2,11] and Abbasghanian study [10] in Mazandaran, the most common age group was 1 to 2 years old. In Stelzle’s study in an urban Tanzanian population, most febrile seizures occurred before the age of two, too [12].

In the present study, the majority of patients were boys. In the studies conducted in Sari, Isfahan, Tehran, Sanandaj, Ardabil, and Tabriz, the majority were male [2,3,8,10,11,13].

Other laboratory tests did not differ significantly between the complex and straightforward FC groups (Table 3).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year</td>
<td>107</td>
<td>18.2</td>
</tr>
<tr>
<td>1-2 year</td>
<td>238</td>
<td>40.4</td>
</tr>
<tr>
<td>2-3 year</td>
<td>184</td>
<td>31.2</td>
</tr>
<tr>
<td>≥3year</td>
<td>60</td>
<td>10.2</td>
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<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>boys</td>
<td>346</td>
<td>58.7</td>
</tr>
<tr>
<td>girls</td>
<td>243</td>
<td>41.3</td>
</tr>
<tr>
<td><strong>Season</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>154</td>
<td>26.2</td>
</tr>
<tr>
<td>Summer</td>
<td>100</td>
<td>17</td>
</tr>
<tr>
<td>autumn</td>
<td>225</td>
<td>38.3</td>
</tr>
<tr>
<td>winter</td>
<td>108</td>
<td>18.4</td>
</tr>
<tr>
<td><strong>Type of delivery</strong></td>
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<tr>
<td>NVD</td>
<td>335</td>
<td>59.4</td>
</tr>
<tr>
<td>Cesarean section</td>
<td>229</td>
<td>40.6</td>
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<tr>
<td><strong>Birth weight</strong></td>
<td></td>
<td></td>
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<tr>
<td>&lt;2500 gr</td>
<td>78</td>
<td>14.9</td>
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<tr>
<td>≥2500 gr</td>
<td>444</td>
<td>85.1</td>
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<tr>
<td><strong>History of hospitalization</strong></td>
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<tr>
<td>87</td>
<td>15.1</td>
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<tr>
<td><strong>History of FC</strong></td>
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<tr>
<td>167</td>
<td>28.8</td>
<td></td>
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<tr>
<td><strong>Family history of FC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>124</td>
<td>21.5</td>
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</tr>
</tbody>
</table>

In terms of demographic characteristics, the participants in this study are similar to other studies conducted in the country. Still, since we examined only one center, patients referred to this center do not represent all patients with FC. There is a need for multicenter studies with larger populations.

Differences in studies can be due to how the study population was selected in various studies.

In the present study, most patients had referred in autumn. In studies in Isfahan and Sari, Febrile convulsion was more common in winter [8,10].

Because the rate of viral and bacterial infections that lead to high fever in children is higher in the cold seasons of the year, more febrile seizures are expected in autumn and winter.

Most patients had simple seizures in the present study, and 16.2% of cases had complex seizures. Simple fever convulsions account for 70-75% of all febrile convulsions [14]. In studies conducted in Ardabil [11] and Mazandaran [10], the most common type of FC was simple type.

The type of seizure in children with febrile seizures was insignificant in terms of age. Complex seizures were more common in boys than girls, but this difference was negligible.

In a study in Isfahan, there was no significant relationship between age, sex, and type of FC [8] which is consistent with our results.

21.5% of patients had a family history of febrile convulsion in the present study. Several studies indicate the role of genetics in the development of febrile seizures. The prevalence of family history of febrile convulsion is 26.4% in Isfahan and 35.5% in Tabriz [2,8].

In a study in Tehran, there was a history of first-degree familial seizures in 21.4% of children. 28.9% of children reported a history of recurrent seizures, and recurrent seizures were more common in children with a positive family history [13].

One of the reasons for different family history in studies can be due not remembering seizures in childhood or refraining from expressing their seizure history due to cultural and personal issues.
The frequency of complex seizures in infants born with a vaginal delivery was significantly higher than in cesarean sections. In a study in Isfahan, 66% of children with febrile seizures were born by cesarean section [8]. Differences in studies can be attributed to the number of cesarean sections performed in different places, especially the number of elective cesarean sections without indication. In Mahmood NS study, vaginal delivery was significantly associated with complex seizures, and no relationship was observed between other factors such as anemia, family history, previous history, birth weight, and type of seizure [15], which is consistent with our results.

Among the laboratory tests performed in children with febrile seizures, only blood calcium was significantly higher in patients with complex FC than in patients with simple FC. In a study in Isfahan, there was no significant relationship between serum potassium, calcium, and sugar levels with fever and seizures [8].

Also, in a study in Sanandaj was observed no statistical relationship between the type of seizure and the serum level of electrolytes [3].

There was no significant relationship between blood hemoglobin level and type of seizure, and the hemoglobin level of patients with febrile seizures was in the normal range. This is similar to the results of the Abbaskhanian, et al. [16] study.

Some studies have shown that anemia can be a risk factor for the onset and recurrence of febrile convulsion [10,17].

In the Razaq M study [18], the mean hemoglobin, hematocrit, and Iron in children with Febrile Convulsion were significantly higher than in the control group.

Since anemia and growth disorders can affect the function of the nervous system and affect the incidence of this disease in children, and inconsistent results in various studies, there is a need for further studies in this field.

CONCLUSION

Because most patients with febrile convulsion were in the age group of 1 to 2 years and were male and had a positive family history, it is recommended to be educated about the importance of febrile seizures and the need for prompt referral and additional examinations in health centers. It is also suggested that more studies be done about FC risk factors in different communities.

ACKNOWLEDGMENT

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REFERENCES


