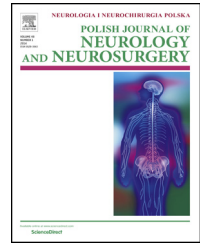


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Original research article

The assessment of risk factors for febrile seizures in children

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ABSTRACT

Objective: The aim of the paper was to assess the risk factors of febrile seizures in children. **Methods:** The paper presents an analysis of a group of 176 children aged 6 months to 5 years who were admitted to A&E because of febrile seizures.

Results: The analysed group of 176 children comprised 61.96% boys and 38.07% girls, and the average age equalled 23 months. Family history was significant in 9.66% of patients. A statistically significant difference was noticed between insignificant family history and the incidence of febrile seizures. In all the studied groups of children the factor that determined the incidence of febrile seizures was a sudden increase in the body temperature with an infection of the upper respiratory tract of several day's duration as another cause. Febrile seizure incident was most frequently associated with a sudden increase in the body temperature in 53.40% children. A statistically significant difference was observed between persisting fever and an increase thereof during the day. Yet another factor predisposing for febrile seizures incidence was an infection of the upper respiratory system that could be observed in 32.95% patients. The mean body temperature when the seizures occurred was 38.9 °C.

Conclusions: A sudden increase in the body temperature within the first day of pyrexia predisposes for the incidence of febrile seizures and it was proved that it depends on how long fever persists during the day. The other factor triggering the seizures was an infection of the upper respiratory tract of several days' duration.

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1. Introduction

Febrile seizures (FS) are the most common neurological disorder occurring in children and have been known since ancient times. Hippocrates described children with high fever who developed seizures that most often accompanied teething. There is the division of febrile seizures into 3 groups, as follows: simple febrile seizures (SFS), simple febrile seizures plus and complex febrile seizures (CFS). Duration of SFS in less than 15 min, seizures are described as generalised tonic clonic. Simple febrile seizures plus are characterised by more than 1 attack SFS, no neurological abnormalities are found. On the other side, we have got CFS with prolonged duration (over 15 min), focal symptoms or multiple seizures occur in close succession. FS should not be caused by meningitis, encephalitis, any other illness affecting the brain or electrolytes disorders. Recently the issue of febrile seizures has become an area of numerous research studies that allowed better understanding of the causes of the disorder and made it possible to devise the rules of medical proceedings [1–3]. The aim of the paper was to assess the risk factors of febrile seizures in children.

2. Materials and methods

The paper presents an analysis of a group of 176 children aged 6 months to 5 years who were admitted to Accident and Emergency Department (A&E) of Specialised Health Care Centre for Mother and Child in Poznan because of FS between 1st January 2008 and 31st December 2009.

The research was a retrospective one and the following factors were taken into consideration during medical records analysis: family history indicative of febrile seizures, if it was the first febrile seizure, body temperature during febrile seizures, the course of a convulsive fit (febrile seizure incidence time, level of child's alertness and consciousness during a convulsive seizure, the exact nature of febrile seizures, post-seizure symptoms), the incidence and character of infection symptoms.

The analysed group of patients was divided into three research subgroups according to age:

- *group 1* (infancy) comprising 27 children aged 6–12 months (including 18 males and 9 females),
- *group 2* (post-infancy) comprising 118 patients aged 12–36 months (including 73 males and 45 females),

- *group 3* (kindergarten) comprising 31 children aged over 36 months and up to 60 months of age (including 18 males and 13 females).

The dependency between the studied characteristics was assessed using Spearman's rank correlation coefficient r_s . $p < 0.05$ value was considered statistically significant.

3. Results

The analysed group of 176 children comprised 61.96% ($n = 109$) boys and 38.07% ($n = 67$) girls, and the average age equalled 23 months \pm SD 13 months.

During the interview information on the past history of febrile seizures in first-degree relatives (siblings and parents) and second-degree ones (the remaining family members) was obtained. Family history was significant in 9.66% of patients with an incidence of febrile seizures in childhood present in 5.11% of parents, 3.41% of siblings and 1.14% in second-degree relatives of the studied group children (Table 1).

Insignificant family history for febrile seizures was observed as follows in all studied groups: *group 1* – 96.30%, *group 2* – 87.29%, and *group 3* – 100%. A statistically significant difference was noticed between insignificant family history and the incidence of febrile seizures ($p < 0.0001$).

In *group 1* 24 (88.89%) out of 27 children developed simple febrile seizures, the remaining part were patients with complex febrile seizures. In *group 2* in 112 children (94.12%) there could be observed simple febrile seizures and 6 (5.08%) patients developed complex ones. In *group 3* no complex febrile seizures were observed.

The first episode of febrile seizures was reported in 150 children (85.23%), the second one in 21 patients (11.93%), and remaining 5 patients related more than three incidents of febrile seizures.

In all the studied groups of children the factor that determined the incidence of febrile seizures was a sudden increase in the body temperature with an infection of the upper respiratory tract of several day's duration as another cause and gastroenteritis (Table 2). The history with the disease shows that three children (1.70%) had been preventively vaccinated a week before having an episode.

Febrile seizure incident was most frequently associated with a sudden increase in the body temperature in 94 children (53.40%) on the first day of fever and concerned 75 patients (42.62%) and with the body temperature increased above 39 °C in 35 (19.89%) children (Table 3).

Table 1 – Family history for the presence of febrile seizures in the studied age groups.

	Group 1			Group 2			Group 3		
	<i>n</i>	%	% total	<i>n</i>	%	% total	<i>n</i>	%	% total
Insignificant	26	96.30	14.77	103	87.29	58.52	31	100	17.61
Febrile seizures in parents	0	0	0	9	7.63	5.11	0	0	0
Febrile seizures in siblings	1	3.70	0.57	5	4.24	2.84	0	0	0
Febrile seizures in distant family	0	0	0	2	1.69	1.14	0	0	0

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