

## Parental Knowledge and Practices Regarding Febrile Convulsions in Turkish Children

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**Aims:** Families with children afflicted with febrile convulsions must be given adequate information regarding seizures and fever, and they need emotional support and first-aid demonstrations. In this study, we aimed to determine parental knowledge and practices regarding febrile convulsions in Turkish children.

**Materials and Methods:** Questionnaires were given to 122 parents whose children were admitted to the emergency service of Behçet Uz Children's Hospital between July 2006 and April 2007 with febrile convulsion episodes. Sixty-three parents whose children had a febrile convulsion for the first time (Group 1) and 59 parents whose children had a recurrent febrile convulsion (Group 2) completed the survey. Differences in parental knowledge and practices regarding febrile convulsions in the two groups were tested by Student's test or chi-square ( $\chi^2$ ) test.

**Results:** Parents in both groups generally believed that febrile convulsion is a life-threatening event (81.2% and 90%), and that EEG and CT were necessary (81% and 88.1%). Forty-seven parents (73.4%) in Group 1 and 52 (85.2%) in Group 2 had concerns about possible development of epilepsy in their children in the future. Approximately half of the parents did not know what to do during a febrile convulsion episode.

**Conclusions:** We believe the questionnaire facilitates the quantitative measurement and systematic evaluation of the knowledge, attitude and concerns of families in the matter of febrile convulsions. Furthermore, the efficiency of parental first-aid practices can be evaluated and significant improvement can be achieved by giving adequate information to the parents.

**Key Words:** Febrile convulsion, childhood, parental knowledge, practice, questionnaire

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### Türk Çocuklarında Ailelerin Febril Nöbetler Hakkındaki Bilgi ve Uygulamaları

**Amaç:** Febril nöbetleri olan çocuğa sahip ailelere nöbetler ve ateş ile ilgili yeterli bilgi verilmelidir ve bu ailelerin duygusal destek ve ilk yardım uygulamalarına ihtiyaçları vardır. Bu çalışmada biz Türk çocuklarında ailelerin febril nöbetlere karşı bilgilerini ve uygulamalarını araştırmayı amaçladık.

**Yöntemler:** Behçet Uz Çocuk hastanesi acil servisine Haziran 2006 ve Mart 2007 arasında febril nöbet epizodu ile çocuklarını getiren 122 aileye anket formu verilmiştir. İlk kez febril nöbet geçiren çocuğu olan 63 aile (Grup 1) ve tekrarlayan febril nöbetleri olan 59 aile (Grup 2) araştırmayı tamamladı. Her iki gruptaki ailelerin febril nöbetlere karşı olan bilgi ve uygulamaları arasındaki farklar student's ve ki-kare testleri ile araştırıldı.

**Bulgular:** Hem Grup 1 hem de Grup 2'deki ailelerin çoğunluğu febril nöbetlerin yaşamı tehdit edici bir bulgu olduğunu (% 81.2 ve %90) ve EEG ve BT'nin gerekli olduğunu (% 81 ve % 88.1) düşünüyordu. Grup 1'deki 47 (%73.4) ve Grup 2'deki 52 (% 85.2) aile ilerde çocuğunda epilepsi gelişebileceği endişesini duyuyordu. Ailelerin yaklaşık olarak yarısı febril nöbet epizodu sırasında ne yapması gerektiğini bilmiyordu.

Sonuç olarak, anket formunun ailelerin bilgi, tutum ve endişelerini sistematik olarak değerlendirmemize ve kantitatif olarak ölçmemize yardım edebileceğini düşündük. Bundan daha fazlası, ailelerin ilk yardım uygulamalarının etkinliği değerlendirilebilir ve ailelere yeterli bilgi verilmesiyle önemli iyileşme sağlanabilirdi.

**Anahtar Sözcükler:** Febril nöbet, çocukluk çağı, uygulama, ailelerin bilgisi, anket formu

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#### Introduction

Febrile convulsion (FC), the most common type of convulsion in childhood, is frightening to parents; it is also one of the most common causes of hospital admissions in children under five years of age (1). The National Institute of Health Consensus Statement (1980) defines a FC as event in infancy or childhood usually occurring between 3 months and 5 years of age, associated with fever but without evidence of intracranial infection or defined cause for the seizure. The prevalence of FC ranges

between 3% and 8% in children up to 7 years of age (2,3). Variation in prevalence relates to differences in case definitions, ascertainment methods, geographical variation, and cultural factors. Parents are shocked to see their children experience a seizure and consider it to be life-threatening. The daily life of some parents is negatively affected by FC, with parents frequently waking at night to follow their children's temperature (4). The best approach for FC should involve establishment of a good communication with parents and should improve their responses to seizures at home. It is of particular importance that the families are relieved of their concerns and are capable of intervening optimally with the disease (5-7). Accordingly, understanding and improving parental knowledge, attitudes, concerns and practices (KACP) toward FCs are essential. Therefore, a quick assessment tool for obtaining information about parental responses to FCs is warranted for educating parents and for use in clinical practice and research (8). Many studies have investigated the etiology and natural history of febrile seizures and evaluated various management strategies, but very little information is available about parental KACP. Various questionnaires about KACP can be found in the literature. However, further studies are required for the application of questionnaires among different cultures (9-11). A literature search did not reveal any study on this aspect from Turkey. Thus, this is the first study in our country that aims to determine via questionnaire the KACP status of parents whose children experience their first or recurrent FC.

## Materials and Methods

In this prospective study, children with FC between 6 months and 5 years of age who were admitted to the emergency service of Behçet Uz Children's Hospital in İzmir, Turkey, between July 2006 and April 2007 were included. Children with prior afebrile seizure history were not included. One hundred and twenty-two parents were asked to fill out the previously prepared questionnaire. When the children's seizure had ceased and his/her condition stabilized, the forms were completed under supervision of a resident. The questionnaire included items regarding family characteristics; their knowledge, attitudes and concerns; and their first-aid practices with FC (Appendix). The questionnaire, which was modified from that by Huang et al. (10), included the following sections: 1) parents' demographic characteristics, 2) past

experiences and beliefs about FC, 3) FC knowledge (11 true/false questions), 4) attitudes and concerns toward FC (7 true/false questions), and 5) performed first-aid practices during FC (14-item yes/no behavior checklist). All the data collected were entered and analyzed using SPSS 12.0 for Windows (SPSS Inc., Chicago, USA). Differences in KACP between the two groups were tested by the Student's test or chi-square ( $\chi^2$ ) test.

## Results

The study group consisted of 70 (57.4%) boys and 52 (42.6%) girls; a total of 122 children. Patients were separated into the following age groups: 6-12 months (29; 23.7%), 1-2 years (61; 50%), 2-3 years (13; 10.7%), and 3-5 years (19; 15.6%). Questionnaires were completed by the mother in 90 (73.8%) cases and by the father in 32 (26.2%). Table 1 lists family characteristics, and no difference was determined between parents of first and of recurrent FC patients. Parents of 63 (51.6%) children with first FC (Group 1) and 59 (48.4%) children with recurring FC (Group 2) completed the questionnaire. In both groups, families believed that FC was associated with fever attacks and the child's age (34, 53%; 35, 57%) ( $P = 0.76$ ) (Table 2).

Regarding general information, families in Group 1 and Group 2 believed that FC was a life-threatening disease (52, 82.5%; 55, 93.2%) and that it could cause brain injury (58, 92%; 59, 100%), and as such, that electroencephalography and cranial computerized tomography (CT) had to be performed immediately (51, 81%; 52, 88.1%). Rates of parents who thought that lumbar puncture should be performed when necessary were 32 (50.7%) and 38 (64.4%) in Group 1 and Group 2, respectively. A major portion of the Group 1 parents, 46 (73%), insisted on use of folk medicine, while this rate in Group 2 parents was only 2 (3.3%) ( $P = 0.00$ ) (Table 3).

As for parental attitudes toward FC, most parents (119, 97.5%) believed that children with FC required frequent body-temperature measurement and special attention for daily care. With a slightly negative attitude toward FC, 60 (49.2%) parents were ashamed of having an FC child and 3 (2.6%) of them believed that FC was due to possession by evil spirits. Parents in both groups indicated concerns such as not being able to predict seizure attacks (44, 68.7%; 43, 70.5%), possibility of

Table 1. Demographic characteristics of parent groups of children with first or recurrent FC.

Items	First FC (n = 63)	%	Recurrent FC (n = 59)	%	P-value
Responder					
Father	18	56.2	14	43.8	0.68
Mother	45	50	45	50	
Family structure					
Core	50	50.5	49	49.5	0.77
Extended	13	56.5	10	43.5	
Location					
Village	4	44.4	5	55.6	0.77
Town	20	48.8	21	51.2	
City	39	54.2	33	45.8	
Children's age at first FC					
6-12 months	20	69	9	31	0.17
1-2 years	27	44.3	34	55.7	
2-3 years	7	53.8	6	46.2	
3 years and above	9	47.4	10	52.6	
Maternal education					
Elementary school	27	53	24	47	0.51
Middle school	5	62.5	3	37.5	
High school	12	66.7	6	33.3	
College	3	50	3	50	
Uneducated	2	28.6	5	71.4	
Paternal education					
Elementary school	5	62.5	3	37.5	0.79
Middle school	5	45.4	6	54.6	
High school	2	40	3	60	
College	3	75	1	25	
Uneducated	2	50	2	50	

Table 2. Parental beliefs regarding cause of FC according to first and recurrent FC groups.

Parental beliefs of FC caused by	First FC (n = 63)	%	Recurrent FC (n = 59)	%	P-value
Abnormal brain electricity	6	35.3	11	64.7	0.23
Fever episode and child's age	34	50.7	33	49.3	0.97
Child's predisposition	9	47.4	10	52.6	0.87
Inheritance	8	61.5	5	38.5	0.64
Supernatural spirits	3	100	0	0	0.26
Lack of knowledge	3	100	0	0	0.26

Table 3. Percentage of correct responses by parents to knowledge-oriented questions in the first and recurrent FC groups.

Questions	Correct answer	Total (n = 122) (%)	First (n = 63)	Recurrent (n = 59)	P-value
FC is epilepsy	F	35(28.7)	17(27)	18(73)	0.81
Anticonvulsant drugs are required for every FC child	F	59(48.4)	24(38)	35(59.3)	0.03
Parents should take their children's temperature frequently	F	119(97.5)	61(96.8)	58(98.3)	0.95
FC is a life-threatening event	F	107(87.7)	52(82.5)	55(93.2)	0.12
FC can cause brain damage	F	117(95.9)	58(92)	59(100)	0.05
Folk medicine is also necessary	F	48(39.3)	46(73)	2(3.3)	0
FC can be outgrown	F	92(75.4)	41(65)	51(86.4)	0.01
More attention and care are needed for FC child	F	119(97.5)	60(95.2)	59(100)	0.26
If necessary lumbar puncture is acceptable	T	70(57.4)	32(50.7)	38(64.4)	0.18
It is shameful to have an FC child	F	60(49.2)	31(49.2)	29(49.1)	0.86
EEG or CT is necessary for every FC child	F	103(84.4)	51(81)	52(88.1)	0.39

occurrence of convulsions at night (55, 85.9%; 59, 100%), and the possibility that convulsions could lead to epilepsy in the future (47, 73.4%; 52, 85.2%) (Table 4).

About half of the parents in both groups did not know what to do during convulsion (32, 50%; 28, 46%), and had concerns regarding a delayed treatment at the next FC attack (32, 50%; 28, 45.9%) and about further seizure attacks (44, 68.7%; 58, 95%). Both groups of parents tried to reduce fever (95.3%, 95%) and take the child to a soft and safe surface (82.8%, 72.1%). Parents in the recurrent convulsion group had better experience in first-aid practices. Higher percentages of parents in the first group compared with the second group shook the child (42.1%, 26.2%), tried to stimulate him/her (75%, 60.8%), and were too overwhelmed to respond (73.4%, 49.1%). As non-recommended first-aid practices, parents described removing oral and nasal secretions (29, 45.3%; 37, 60.1%) and trying to pry the convulsing child's clenched teeth apart and placing things into the mouth (23, 35.9; 25, 40.9%). Unfortunately, 9 parents (14%) in Group 1 and 3 (5%) in Group 2 expressed that they performed cardiac massage during the seizure attack (Table 5).

## Discussion

FCs are the most common seizure disorder in childhood. They are benign and have a normal cognitive outcome (12). Health specialists must better understand the behaviors of parents whose children have FC to ensure appropriate care. Our study demonstrated that a questionnaire could facilitate the quantitative measurement and systematic evaluation of the parental KACP status toward FC. Furthermore, the efficiency of parental first-aid education can be evaluated (9). Results showed that a high proportion of parents perceived FC as epilepsy, believed epilepsy may develop and believed that anticonvulsants were necessary. These findings are in accord with those of previous studies (10,11). However, risk of epilepsy following simple FC (SFC) or complex FC (CFC) is 1-2.4% and 4.1-6%, respectively. Use of anticonvulsants does not reduce the risk of epilepsy development. Furthermore, long-term anticonvulsant medication could cause side effects that dominate over minor risks of SFC (13,14). Hence, parents must be informed that most FCs spontaneously recover with excellent long-term prognosis. Children with frequently recurrent SFC and CFC (and accompanying cerebral palsy

Table 4. Percentage of parents' responses to attitude- and concerns-oriented questions in the first and recurrent FC groups.

Questions	Total (n = 122) (%)	First (n = 63)	Recurrent (n = 59)	P-value
One cannot foresee a seizure attack	69.6	44(68.7)	43(70.4)	0.98
Further seizure attacks will occur	81.6	44(68.7)	58(95)	0.00*
Do not know what to do for child during FC attack	48	32(50)	28(45.9)	0.77
Fear of delayed treatment at next FC attack	44.8	32(50)	28(45.9)	0.95
Siblings will also have FC	66.4	39(60.9)	44(72.1)	0.25
FC will develop into epilepsy	23(18.4)	47(73.4)	52(85.2)	0.15
Seizure will occur at night	92	55(85.9)	59(100)	0.01*

Table 5. Percentage of parental experience with the recommended and non-recommended first-aid practices during attacks in the first and recurrent FC groups.

Recommended items of first-aid practices	First (n = 63) Performed	%	Recurrent (n = 59) Performed	%	P-value
Lower the child's body temperature	61	95.3	57	93.4	0.94
Protect on a soft and safe surface	53	82.8	44	72.1	0.22
Lay the child on his/her side	30	46.8	33	54	0.52
Remain calm	18	28.1	23	37.7	0.34
Observe seizure manifestations and duration	44	68.7	48	78.6	0.29
Non-recommended					
Rush the child to doctors without first-aid	50	78.1	43	70.4	0.85
Shake and arouse the convulsing child	27	42.1	16	26.2	0.09
Try to pry the convulsing child's clenched teeth apart and put things into mouth	23	35.9	25	40.9	0.63
Attempt mouth-to-mouth resuscitation	9	14	3	4.9	0.15
Suck discharge from nose and mouth	29	45.3	37	60.6	0.12
Perform cardiac massage	9	14	3	4.9	0.15
Restrain the convulsing child	51	79.6	44	72.1	0.43
Stimulate the convulsing child	48	75	37	60.6	0.12
Too overwhelmed to respond	47	73.4	30	49.1	0.01

and growth retardation), multiple CFC and febrile status epilepticus must be given prophylactic treatment (15,16).

When the two groups were compared, it was noted that a significant portion of the parents in the first group believed that FC would be progressive, would require anticonvulsant medication and that folk medicine was also necessary. On the contrary, interestingly, parents in the second group were less likely to believe that folk medicine was also necessary. In a study performed in Malaysian children, folk medicine was given to 12% of children with FC (17). Recurrence rate of FC after the first episode is 30%; half of the convulsions recur in the first 6 months, three-quarters within a year, and 90% within 2 years (15,16). Risk factors identified for recurrence include (i)

young age (<18 months), (ii) family history of FCs in a first- or second-degree relative, (iii) a low temperature at the initial FC, and (iv) multiple FCs occurring during the first episode (16,18). Even febrile status epilepticus in a neurologically normal child does not increase the risk for recurrence (19). It should be remembered that an episode of fever is, in fact, the only time that the child is at risk of recurrence (20).

Our study showed that parents have significant concerns regarding recurrence and prognosis of FC, and furthermore, concerns that FC will develop into epilepsy. A higher number of parents in the recurrent FC group had concerns regarding further seizure attacks and night-time convulsions. However, there is no evidence that

recurrent SFCs lead to brain damage, learning problems or premature death (13). FCs have an excellent outcome; population studies show normal intellect and behavior, even for children with CFC (21,22). Recent population-based prospective case controlled studies from Taiwan found that children who had FC did at least as well as, if not better, than controls on measures of intelligence, academic achievement, behavior, and working memory (23). Hence, families must be informed regarding recurrence and prognosis of FC, and the benign nature of the disease must be emphasized.

Our study showed, in good accord with that of Huang et al. (10), that although parents faced a FC episode on several occasions, they still described inadequate first-aid practices. We determined that 78.1% and 70.4% of the parents in the first and second groups, respectively, admitted their children to the hospital without giving prior first-aid. Similarly, this rate has been reported as 36-90% in previous studies (4,11,24). Parents in the first group commonly tried to insert an object in the child's mouth and to shake the child to receive a response, and they also attempted cardiovascular resuscitation, which could be more hazardous. Thus, giving adequate first-aid information may reduce parental anxieties (8).

Our results showed that some parents frequently measured the child's temperature. Most parents had concerns regarding high fever and believed that it would cause brain damage and subsequent seizures. A previous study showed that 24% of the families developed dyspepsia, 74% developed insomnia and a portion of them lost weight (4). Some parents developed a fear of fever, with each fever episode resulting in nightmares in some (25). Hence, the fear towards fever must be reduced in families.

Families generally insist that various tests be performed urgently. However, electroencephalography and cranial CT are not indicated after the first FC episode, and lumbar puncture is only indicated in the course of clinical suspicion. No evidence exists that epileptiform discharges in children with FC have any diagnostic or

prognostic implications, even in the subgroup with CFC. Therefore, no rationale exists for performing an electroencephalograph in FC (26). Neuroimaging is not necessary in children with SFC. According to a case series of 71 children, children who present with CFC and are otherwise neurologically normal are unlikely to have significant intracranial pathological conditions, such as a space-occupying mass lesion, hemorrhage, hydrocephalus, abscess, or cerebral edema, which require emergency neurosurgical or medical intervention. Elective magnetic resonance imaging should be considered in children with recurrent CFC who have other neurological findings, including abnormal head circumference, significant developmental delay, and persistent focal neurological abnormality (27,28).

Studies have reported that, compared with the control group, significant improvement was achieved by educating the parents regarding KACP (8,29). Advice regarding how to remain calm in the course of a seizure must be given to families. They should be taught how to measure temperature using a thermometer and how to do tepid sponging when the child has fever. They should be counselled regarding the correct dose of an antipyretic agent (paracetamol or ibuprofen) that needs to be given at home when fever is detected in order to comfort the child. They should consult a family physician quickly, since any febrile illness, per se, requires medical attention. They should also be taught by actual demonstration how to place their child in the left lateral position with chin up for optimal airway patency in case of recurrence (29).

In conclusion, we found that families with children with FC admitted several times to hospital still lacked adequate knowledge regarding FC; they had concerns regarding the child's health; and they were not conducting optimum first-aid practices. We also noted that although parents in the recurrent group had more information and better practice, they had increasing concerns and still tended to believe in folk medicine. We believe the questionnaire can be used to rapidly determine the KACP status of families with regard to FC.

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## Appendix

### Parental Responses to First and Recurrent Febrile Convulsions

Name of the child with febrile convulsion:

Age:

Sex: a) male b) female

Number of seizure episodes experienced by the child:

#### Family Characteristics

1-Who completed the questionnaire?

a) mother b) father

2-Family structure:

a) Core family

b) Extended family

3-Family residence:

a) village b) town c) country d) province

4-Child's age at the time of the initial FC episode:

a) 1-6 months

b) 6-12 months

c) 1-2 years

d) 2-3 years

e) >3 years

5-Parental education:

a) Primary school

b) Secondary school

c) High school

d) University

6-Mother's age:

7-Father's age:

#### Parental Belief Regarding Cause of FC

In your opinion, which of the following are the main causes of FC?

a) Abnormal conduction of electric current in the brain

b) Fever episode and child's age

c) Child's predisposition

d) Inheritance

e) Supernatural spirit

#### Knowledge about the Causes of FC

1-FC is epilepsy

a) True b) False

2-Anticonvulsant drugs are required for every child with FC

a) True b) False

3-Parents should take their children's temperature frequently

a) True b) False

4- FC attack is a life-threatening event

a) True b) False

5-FC can cause brain damage

a) True b) False

6-Folk medicine is also necessary

a) True b) False

7-FC can be outgrown

a) True b) False

8-More attention and care are needed for a child with FC

a) True b) False

9-If necessary, lumbar puncture is acceptable

a) True b) False

10-It is shameful to have a child with FC

a) True b) False

11. EEG or CT is necessary for every FC child

a) True b) False

#### Attitudes Toward FC

1-FC can develop into epilepsy

a) True b) False

2-One cannot foresee a seizure attack

a) True b) False

3-A further seizure attack will occur

a) True b) False

4-I do not know what to do for my child during the FC episode

a) True b) False

5-I am concerned that treatment for the next FC episode will be delayed

a) True b) False

6-Siblings will also have FC

a) True b) False

7-Seizure can occur during the night

a) True b) False

#### Parental Practices in Response to FC

1-Lower the child's body temperature

a) Yes b) No

2-Protect the child on a soft and safe surface

a) Yes b) No

3-Place the child on his/her side

a) Yes b) No

4-Remain calm

a) Yes b) No

5-Observe seizure manifestations and duration

a) Yes b) No

6-Rush the child to a doctor without first-aid

a) Yes b) No

7-Shake the convulsing child

a) Yes b) No

8- Pry the convulsing child's clenched teeth apart and put something in his/her mouth

a) Yes b) No

9-Attempt mouth-to-mouth resuscitation

a) Yes b) No

10-Suck discharge from the child's nose and mouth

a) Yes b) No

11-Perform cardiac massage

a) Yes b) No

12-Restrain the convulsing child

a) Yes b) No

13-Stimulate the convulsing child

a) Yes b) No

14-Too overwhelmed to respond

a) Yes b) No