

CAN EDUCATIONAL PROGRAMS HELP EASE PARENTAL ANXIETY FOLLOWING THEIR CHILD FIRST FEBRILE CONVULSION?

A.R. Farsar MD¹,
A.A. Kolahi MD²

Abstract Objective

Compared to other pediatric emergencies, febrile convulsions (FC), despite having an excellent prognosis, are a main cause of considerable anxiety among mothers of children faced with their child's first febrile convulsion. Consequently, one of the physician's most important responsibilities in the management of pediatric febrile convulsions is to educate and guide mothers on how to reduce their anxiety. This study was performed on mothers whose children had been admitted to Mofid Children's Hospital following a first febrile convulsion, to determine the effect of education on lowering the levels of maternal anxiety after their child's first febrile convulsion.

Materials and Methods

In this sequential control clinical trial, 84 volunteering mothers were divided in two matched groups, the intervention and the controls. Maternal anxiety levels were determined in both groups by the State Trait Anxiety Inventory (STAI) standard questionnaire (pretest). Following this, the intervention group of mothers underwent face-to-face education for 3 hours, whereas no intervention was used for the control group. After nine days, anxiety levels were determined in the two groups using the same questionnaire (post-test). The data was analyzed using the Mann-Whitney, the Wilcoxon Signed Rank Sum, and the McNemar tests, and chi-square analysis.

Results

Results show that in the intervention group, maternal anxiety decreased significantly ($p < 0.001$), whereas no significant difference was seen in the control group.

Conclusion

This study demonstrates that maternal education on FCs significantly reduces maternal anxiety, in coping with stress following their child's first febrile convulsion, and considering the results of similar studies, educational programs are highly recommended for mothers having children who suffer from the condition.

Keywords: Febrile Convulsion, Education, Anxiety

Introduction

Febrile convulsions generally occur in children between the ages of 3 months to 5 years and are characterized by an absence of any symptoms or evidence indicating intracranial infection(1-2). The prevalence of febrile convulsions has been estimated to be 2-5%(1). Recurrence is seen in 30% of the patients and epilepsy has been observed in 2-4%(3-4), these two being considered the most important

1. Assistant Professor of Pediatrics, Mofid Children Hospital, Shahid Beheshti Medical University
2. Associate Professor in Community Medicine, Shahid Beheshti Medical University

Corresponding Author:
A.A. Kolahi MD, Department of
Community Medicine,
Faculty of Medicine
Tel: +98 21 2387 2567-8
Fax: +98 21 2241 4108
Cell: +98 912 134 0541
Email: a.kolahi@sbmu.ac.ir

complications of first episode febrile convulsions(5). Febrile convulsions have not been reported to have any effect on intellectual outcomes(6), and there are no documented cases of febrile seizure-related deaths on record(4), making the overall prognosis of febrile convulsions excellent (4,7-8).

Although the management of febrile convulsion is an extremely controversial issue among specialists (9), the intervention generally agreed upon is educating the parents and providing reassurance to help decrease their anxiety; although this measure has been referred to as being the most important role of the physician (10), the practical methods and details of such interventions have rarely been explained or discussed.

Causes for parental anxiety, in addition to the grotesque manifestation of the convulsions, may be fear of infant death, helplessness of the mother due to ignorance towards the nature of the incident, uncertainty of the prognosis, worries of recurrence with subsequent fevers, and fear of the complications and effects that the convulsions could have on the neurological development and performance of the child. Parental awareness and education can increase and enhance knowledge, induce changes in attitude, boost maternal self-confidence, all of which, in turn, lessen the anxiety and stress and greatly improve/hasten/ speed up the well being of both the child and family.

A previous study demonstrated that 77.9% of the parents believed that their convulsing child was dead or dying, 15.4% thought that their child was choking, and overall 65.4% showed signs of anxiety (11). Parents believe that when confronted with convulsion, there is a large difference between their attitudes and that of physicians, and most parents would like to know more about febrile convulsion(12). All parents with a child diagnosed with febrile convulsion have experienced high levels of anxiety, which can be attributed to a lack of knowledge regarding the management of a convulsing child, cerebrospinal fluid taps, and electroencephalograms (EEGs) (13).

Parental education increases their knowledge and significantly decreases their anxiety (14). Most parents of children with febrile convulsions have been reported to have inadequate knowledge, high concerns, and improper first-aid practices and to be in need of the appropriate information, emotional support, and first-aid demonstrations(15). Other recent studies also confirm the

lack of adequate knowledge in parents whose children had experienced febrile convulsions(16-17).

One study demonstrated that knowledge played an important role in anxiety; 79% of the parents of convulsing children with no knowledge experienced severe anxiety, compared to 59% of the parents who had the related information knowledge, a difference that although significant statistically, still showed a high incidence of anxiety in parents with knowledge(18).

As mentioned earlier, in the management of febrile convulsion, anxiety reduction is one of the most important interventions of the treating physician; details on how this may be accomplished however are unfortunately are not yet clear. The question this study was designed to answer is to what degree can education per se reduce parental anxiety?

Materials and Methods

The current study was performed as a sequential clinical trial. Subjects included mothers whose children were admitted to Tehran's Mofid Children's Hospital for a first episode of febrile convulsion; 84 participants, following obtaining of written consent, were divided in two, the intervention and the control, groups, based on date of admission. First, the mothers of all FC patients were included in the intervention group until the group contained the required number of subjects. Subsequently, mothers of all remaining febrile convulsion patients were included in the control group until they met the required number; random assignment of the mothers to the two groups was not feasible, because concurrent presence of mothers from both groups in the same ward would cause information to be exchanged between the intervention and the control group.

The inclusion criteria for the study included: a diagnosis of first episode febrile convulsion, no history of prior convulsions without association to fever, no history of neurological deficit or other serious medical conditions, no family history of convulsions with or without association to fever and no history of psychiatric disorders in mothers. The mothers were interviewed on the second day of hospital admission, using questionnaires requiring demographic information on the mother and child, the mother's interpretation of the incident, her reaction to the convulsions, the child's underlying diagnosis that caused

fever, whether they had been seen by a physician or not, medications used, and maternal worries about the child's prognosis. Maternal anxiety levels were assessed using the State Trait Anxiety Inventory (STAI) questionnaire, an evaluation which served as a pretest. The STAI questionnaire was created by Berger and includes 20 items that determine the total level of anxiety at the time of the interview(19). Each item is given a score from 1 to 4, with total scores ranging between a minimum of 20 (20×1) and a maximum of 80 (20×4). This questionnaire had already been standardized in Farsi by a researcher in Iran (20).

Following this, a 3-hour face-to-face educational session was arranged inside the hospital for mothers in the intervention group; in addition, educational material was handed out to them as small pamphlets, which included the definition of convulsions, categorization of convulsions, febrile convulsions, etiologies, complications, management, prognosis, practical ways to prevent febrile convulsion, how to measure fever, ways of lowering fever without medication, determining the necessary amount of Acetaminophen for every child contracting fever, necessary measures in case of recurrence, and the relative safeness of lumbar punctures and EEGs (21-23). The post test was performed 9 days after discharge by measuring anxiety levels with the STIA questionnaire. The ninth day was chosen because hospital guidelines schedule routine EEGs for convulsion patients on the tenth day after discharge. Since the results of the EEG could affect maternal anxiety levels, the post test was

performed one day previous to the EEG. Following the post test, and completion of data collection educational programs were arranged for mothers in the control group as well.

Data obtained was analyzed using the Mann-Whitney, the Wilcoxon Signed Rank Sum and the McNemar tests, and chi-square analysis.

Results

Following their child's first convulsion, most mothers, of both groups had immediately taken the child to the nearest medical center or private physician's office (95.2%). Of all subjects, 75% were transferred to the hospital within the first hour of the convulsive episode and 92.8 % were admitted within the first two hours.

Tables 1 and 2 represent the characteristics of the children and mothers in both the intervention and control groups and demonstrate the absence of statistically significant differences of the studied variables between the two groups.

The educational strategy/intervention provided to the mothers was observed to have relieved anxiety due to all /any causes, and the differences between anxiety levels in the intervention group, before and after education, were found to be significant for every subgroup (p<0.001). In the control group no significant difference was observed in any of the subgroups (table 3).

Overall anxiety levels in the control group, however, showed no statistical differences between the pretest and the posttest evaluation results (table 4).

Table 1: Characteristics of children in intervention and control groups

Variables		Intervention n=40	Control n=44	P value
Sex	Male	18 (45)	20 (45)	NS*
	Female	22 (55)	24 (55)	
Age of child (Months)	(Mean ±SD)	20.7±10.6	18.8±11.4	NS
Child's underlying illness	Respiratory infection	34 (85)	39 (89)	NS
	Diarrhea	6 (15)	4 (11)	
Acetaminophen use before convulsion	Yes	32 (80)	35 (80)	NS
	No	8 (20)	9 (20)	
Referral to physician before convulsion	Yes	32 (80)	33 (75)	NS
	No	8 (20)	11 (25)	
Referral to physician after convulsion	<30 minute	38 (95)	42 (95)	NS
	>30 minute	2 (5)	2 (5)	
Duration of convulsion	(Mean ±SD)	4.5±2.5	4.2±2.5	NS
Type of convulsion	Tonic-clonic	32 (80)	33 (75)	NS
	Tonic	8 (20)	11 (25)	
Time of hospitalization after convulsion episode	< 1 hour	32(80)	31 (70)	NS
	1-2 hours	6 (15)	9 (20)	
	>2 hours	2 (5)	4 (10)	

* Non-significant

Table2: Characteristics of mothers in intervention and control groups

Variables		Intervention n=40	Control n=44	P value
Age of mother (Years)	(Mean ±SD)	27.6±5.2	28.8±5.4	NS
Mother's Education	Primary school	4 (10)	5 (11)	NS
	Secondary school	6 (15)	9 (20)	
	High school	24 (60)	24 (55)	
	University	6 (15)	6 (14)	
Mother's occupation	Householder	34 (85)	33 (75)	NS
	Employed	6 (15)	11(25)	
Maternal interpretation of incident	Convulsion	20 (50)	20 (45)	NS
	Death	14 (35)	18 (41)	
	Other**	6 (15)	6 (14)	
Measures taken by mother during convulsion	Partially correct	2 (5)	8 (18)	NS
	Incorrect	8 (20)	8 (18)	
	Nothing	30 (75)	28 (64)	
Causes of concern	Future well-being	38 (95)	42 (95)	NS
	Recurrence	30 (75)	26 (59)	
	Physical dysfunction	12 (30)	13 (30)	
	Mental retardation	18 (45)	22 (50)	
	Learning dysfunction	10 (25)	9 (20)	
	Paralysis	8 (20)	18 (41)	
	Others***	28 (70)	13 (30)	

** Did not know, fear, Paralysis.

*** Defect in vision, hearing loss, memory dysfunction, brain defect, somatic disability, delay in walking, disability for working in adulthood, adverse drug reaction, coma and death.

Table 3:Causes of maternal anxiety in intervention and control groups

Groups	Control (n=44)			Intervention (n=40)		
	Before	After	P value	Before	After	P value
Future well-being	42(95)	35(80)	NS	38 (95)	10(25)	<0.001
Recurrence	26 (59)	28(64)	NS	30 (75)	2(5)	<0.001
				12 (30)	2(5)	<0.001
Physical dysfunction	13 (30)	12(27)	NS	18 (45)	4(10)	<0.001
				10 (25)	2(5)	<0.001
Mental retardation	22(50)	20(45)	NS	8 (20)	2(5)	<0.001
				28 (70)	2(5)	<0.001
Learning dysfunction	9(20)	7(16)	NS			
Paralysis	18 (41)	15(34)	NS			
Others*	13 (30)	15(35)	NS			

* Defect in vision, hearing loss, memory dysfunction, brain defect, somatic disability, delay in walking, disability for working in adulthood, adverse drug reaction, coma and death

Table 4: Comparison of maternal anxiety in intervention and control groups

		Control n=44	Intervention n=40
Initial interview (Pretest)	(Mean ±SD)	61.5±7.5	60.4±7.2
Second interview (Posttest)	(Mean ±SD)	58.8±6.3	32.5±9.2
P value		NS	<0.001

Discussion

The findings of the current study show that parental education significantly decreased anxiety in the intervention group, a finding in accordance with those of the 1998 Taiwan study by Huang et al (14), whose study unlike ours was randomized; the main difference however was that our study was conducted within the first two days of admission, while their study was performed months after the convulsion episodes. Both studies showed a decrease in anxiety along with an increase in knowledge.

In the present study, 47.6% of the mothers recognized the episode as a convulsion, and 38% believed the child was dying. In the 1991 Balslev study from Denmark, 77% of the mothers believed the child was dying, 33% recognized the episode as febrile convulsion, and 15.4% thought the child was choking or had meningitis(11). A more recent 2001 study of 140 parents by Parmar et al in India revealed that 40.7% of the parents recognized convulsions, others interpreted the seizure as an alteration of sensorium (29.2%), fainting spells (10.7%), shivering (9.3%), suffocation (6.4%), lethargy (2.1%), or drug reactions (1.4%)(16).

Although 88% of the mothers in our study recognized high fever as the cause of febrile convulsions, 77.3% had seen a physician, 79.7% had given the child a form of acetaminophen, and 67.8% were familiar with further necessary measures (which could have been learned during the two day period after admission and before the interview), 69% of the mothers had brought the children to the hospital with no measures taken whatsoever) and only 19% had taken inappropriate and unnecessary measures, such as placing the child in warm water, giving acetaminophen, opening the child's mouth, holding the child tight, blowing air in the child's mouth while holding the child's bottom tightly, or rubbing alcohol on the soles

of the feet. Just 11.9% had taken any reasonably correct measures. In the 1998 study by Huang et al, 41% tried opening the mouth and 56% had laid the child down on its side, and overall acted more correctly than mothers in our study (14). In the 2002 Huang et al study however, it was observed that during the first episode, objects were frequently inserted into the child's mouth and they were rushed to a hospital. One third of the parents lowered the child's body temperature, and 15% positioned the children on their side. For subsequent seizures, 80% anticipated rushing the child to a hospital, and 44% would put objects into the child's mouth(15). In the 2001 study by Parmar et al, 90.7% of the parents did not carry out any intervention prior to getting the child to the hospital. Others took measures such as shaking the child (2.1%), firm application of broken onion at the nostrils with forceful closure of mouth (4.3%) and tepid sponging (2.9%). Only 7.1% were aware of the risk of vomit aspiration; of these 2.9% knew the preventive measure of laying the child on one side to prevent its occurrence (16). The 2001 study by Flury et al done in Switzerland also exemplifies a high incidence of incorrect and potentially dangerous procedures. For the first febrile convulsion, 29% of the parents positioned the child to the side and 42% tried to control the fever with medication, but 5% performed chest compressions and 16% did mouth-to-mouth respiration(18).

The children in our study were immediately brought to a physician in 95.2% of the cases and 75% were hospitalized within the first hour. Not one the mothers definitely knew the correct measures to be taken should there be a recurrence of the convulsions. These facts demonstrate low levels of knowledge and the incorrect attitudes and practices of mothers regarding febrile convulsions.

Like the parents of FC children, in studies by Miller in 1996 in England (12) and Flury, et al in 2001 in

Switzerland (18), most mothers wished they had had more information beforehand or had, at least, been told about febrile convulsions during the first hours of admission.

The subjects of this study may not be representative of the entire community and it cannot be said that all mothers react to the first episode of febrile convulsion with the same level of anxiety. Perhaps for some unknown reason such as educational or socio-economical levels, these mothers might have had higher levels of anxiety to begin with and this factor itself has led to their children being hospitalized in the first place. One thing is certain, many cases of febrile convulsion are overlooked and do not result in hospital admission.

Staying in the hospital for at least two days without rest may have caused increased levels of anxiety in mothers. On the other hand, the pretest was performed on day two of admission, when the convulsions had been controlled and admission of the child may have provided some reassurance for the mother, lowering therefore somewhat the anxiety levels. Additionally, the interviews were not conducted by the treating physicians; hence factors such as the age and attitude of the interviewer may have influenced the maternal anxiety levels documented. Nonetheless, the design of the study with pretest and post test utilization and pairing of subjects, insures the credibility and validity of this study, at least under similar circumstances.

It must be mentioned that the objective of pairing subjects was to control external and coincidental factors that may have influenced the results. Thus, the difference induced by intervention (education) would not be affected by the existing individual differences of the subjects (24).

It also must be emphasized that when the data is already paired, like for a before and after an intervention, there may not be a need for a control group; but in this study a control group was added to rule out the possibility of having time and other nonspecific factors reduce anxiety levels.

The main reason for maternal anxiety in this study as with most diseases/frightening encounters was a lack of knowledge. Febrile convulsion was chosen as an example to emphasize the importance of education and communication between physicians and health care personnel on one hand, and the patient and family on the other.

Conclusion

The current study showed that the education of mothers, faced with their child's first FC episode significantly decreases anxiety. Considering similar results reported from other studies, educational programs can be recommended for all mothers of children with febrile convulsions.

Reference

1. Fetveit A. Assessment of febrile seizures in children. *Eur J Pediatr* 2008;167: 17–27.
2. Huang MC, Huang CC, Thomas K. Febrile Convulsions: Development and Validation of a Questionnaire to Measure Parental Knowledge, Attitudes, Concerns and Practices. *J Formos Med Assoc* 2006;105(1): 38–48.
3. Gordon KE, Camfield PR, Camfield, CS, Dooley JM, Bethune P. Children With Febrile Seizures Do Not Consume Excess Health Care Resources. *Arch Pediatr Adolesc Med* 2000;154: 594–597.
4. Jones T, Jacobsen SJ. Childhood Febrile Seizures: Overview and Implications. *Int J Med Sci* 2007;4:110–114.
5. Hirtz DG. Febrile Seizures. *Pediatr Rev* 1997;18: 5-8.
6. Verity CM, Greenwood R, Golding J. Long-Term Intellectual and Behavioral Outcomes of Children with Febrile Convulsions. *NEJM* 1998;338:1723-1728.
7. Sadler LG, Scheffer IE. Febrile seizures. *BMJ* 2007;334:307-311.
8. Monsen RF, Graham WN, Snell, GF. Febrile Seizure: Caring for patients- and their parents, *Postgrad Med* 1991; 90: 217-8.
9. Camfield PR, Camfield CS. Management and Treatment of Febrile Seizures. *Curr Probl Pediatr* 1997; 27: 6-13.
10. Taylor RB. *Family Medicine Principles and Practice*. New York: Springer- Verlag ;1998.P. 555.
11. Balslev T. Parental Reactions to a Child's first Febrile Convulsion: A follow-up investigation. *Acta Paediatr Scand* 1991;80: 466-9.
12. Miller R. The Effect on Parents of Febrile Convulsion. *Pediatr Nurs* 1996;8:28-31.

13. Shupoer A, Gabbay U, Mimuni M. Parental Anxiety in Febrile Convulsion, *Isr J Med Sci* 1996;32: 1282-5.
14. Huang MC, Liu CC, Huang CC. Effects of an Educational Program on Parents with Febrile Convulsion Children, *Pediatr Neurol* 1998;18: 150-5.
15. Huang MC, Liu CC, Huang CC, Thomas K. Parental responses to first and recurrent febrile convulsions. *Acta Neurologica Scandinavica* 2002;105: 293-9.
16. Parmar RC, Sahu DR, Bavdekar SB. Knowledge, Attitude and Practices of Parents of Children with Febrile Convulsion. *J Postgrad Med* (2001) 47: 19-23.
17. Al-Eissa YA, Al-Sanie AM, Al-Alola SA. et al, Parental Perceptions of Fever in Children. *Ann Saudi Med* 2000;20: 202-5.
18. Flury T, Aebi C, Donati F. Febrile seizures and parental anxiety: does information help?. *Swiss Med Wkly* 2002;131: 556-60.
19. Berger S. Theory and Measurement of Anxiety State: *Handbook of Modern Personality Theory*. 3rd ed, Chicago: Aldine;1971.P.178-9.
20. Mosallaezadeh Yazdi M. The Effect of Viewing Procedure Videos on Anxiety Reduction in Patients of the Dental Surgery Ward. Kerman Medical University. Medical Doctorate Dissertation 1995; 23-47.
21. Hoare P, Russell M. The Quality of Life of Children with Chronic Epilepsy and their Families. *Develop Med Child Neurol* 1995;37: 689-696.
22. Kaplan HI, Sadock BJ. *Synopsis of Psychiatry*. 7th ed. NewYork: Williams and Wilkins;1994.P.573-616.
23. Behrman RE, Kliegman RM. *Nelson Essentials of Pediatrics*. 3rd ed, WB Saunders;1998.P.718-9.
24. Altman D. *Practical Statistics for Medical Research*. London: Chapman &Hall;1991.P.191-2.