Etiology, Epidemiologic Characteristics and Clinical Pattern of Children with Febrile Convulsion Admitted to Hospitals of Germi and Parsabad towns in 2016

Mehri Seyed Javadi (1)
Roghayeh Naseri (2)
Shohreh Moshfeghi (1)
Irandokht Allahyari (1)
Vahid Izadi (3)
Raheleh Mohammadi (1)

(1) Instructor and Faculty Member of Ardabil University of Medical Science, Nursing and Midwifery School, Ardabil, Iran
(2) Instructor and Faculty Member of Ardabil Islamic Azad University, Ardabil, Iran
(3) BA in Nursing, Student Research Committee of Ardabil University of Medical Science, Ardabil, Iran

Correspondence:
Raheleh Mohammadi
Instructor and Faculty Member of Ardabil University of Medical Science, Nursing and Midwifery School, Ardabil, Iran
Email: r.mohammadi@arums.ac.ir

Abstract

Background and Purpose: Febrile convulsion is the most common neurological disorder in children. Despite the studies, there are always controversies about the clinical and epidemiological patterns regarding the effect of genetic factors and climatic conditions on its incidence. The present study was carried out to investigate the etiologic, epidemiologic and clinical features of febrile seizure in children admitted to the Children's Hospital of Germi and Parsabad in Ardebil province.

Methodology: This retrospective descriptive cross-sectional study was conducted on 148 cases of admitted children due to febrile convulsion from April to March 2016 in Parsabad and Germi hospitals. The used instrument was a researcher-made questionnaire including demographic data and characteristics of the child's seizure attack. Validity of questionnaire was determined using the content validity method and its reliability was also measured by the observational method. Data were analyzed using SPSS version 22 and descriptive statistics of mean and standard deviation, Chi-square and T-test.

Findings: The prevalence of febrile convulsion in Germi and Parsabad during a year was 6.25%. Among 148 children, 87 children were male and 61 of them were females. The average age of patients was 24.6 ± 15.15 months and the peak of febrile seizure prevalence was between the ages of 1 to 2 years, and the majority of the cases had (81.8%) simple febrile seizure. The most common cause of fever in patients was upper respiratory infection (39.2%) and diarrhea (18.2%), respectively. There was a significant relationship between previous history of seizure, duration of seizure, age of child, duration of fever onset to seizure occurrence and seizure type(p<0/05).

Conclusion: This study showed that the prevalence of febrile convulsion in children younger than 2 years old is more common in males and prevalence of simple seizure is more common compared to complexseizure. Also, the history of seizure, seizure duration, child's age, and duration of fever onset to seizure occurrence are effective in seizure incidence.

Key words: Febrile seizure, children, etiology, clinical pattern, epidemiologic characteristics

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Introduction

Febrile seizure is the most common neurological disorder in children (1), and it happens in 3-5% of American and European children and over 14% in Asian children under the age of 6 (2). Febrile seizure refers to those cases where seizure occurs at temperatures higher than 38 ° C in children from one month to seven years, who are neurologically healthy and have no sign of CNS infection or acute electrolyte imbalance and previous history febrile seizure (3). Febrile seizures mostly occur in children between the ages of six months and six years (2). The most prevalent age for affected children is 10 to 18 months and in 75%, it occurs in children younger than 3 years old (4,5). Febrile seizure occurs at temperatures above 38 ° C and it requires acute, emergency, chronic and long-term control (6). The cause of febrile seizure remains unknown, and so far 3 categories of dominant autosomal genes have been identified that justify the occurrence of familial fever and seizure (7). Positive family history has been confirmed as one of the predisposing factors for febrile convulsion (8,9,10). There is some seasonal differences in febrile convulsion occurrence and maximum prevalence can be observed in November and January (probably due to infection of the upper respiratory tract), June and July (possibly due to intestinal infection) in children (11). Viral infections of the upper respiratory system, Acute Otitis Media, gastroenteritis and roseola infantum are among the most common causes of fever in these patients. Fever and convulsion based on clinical symptoms are divided into two groups of simple and complex seizure (12, 13). Despite the existing studies in children's neurology, the discussion of febrile seizure is one of the topics which is always a lot of controversy about clinical and epidemiological patterns regarding the effect of genetic factors and climatic conditions on its incidence (14,15,16). Therefore, regional and global studies are needed to investigate the characteristics of febrile seizure and in identifying the patients who are at risk, and investigating demographic characteristics such as age, sex, family history, type of seizure, and the interval between febrile onset and seizure so that extra measures can be taken to prevent the recurrence of attacks. For example in Iran, various studies reveal different statistics. A study in Tabriz in 2004 showed that, 40% of children were admitted in hospital because of febrile convulsion (17), and in Birjand in 2007, 70.4% of children admissions was due to febrile convulsion (16). Due to the lack of studies regarding demographic and etiological characteristics and clinical patterns of fever and seizure in Germi and Parsabad, the aim of this study was to assess the etiology, epidemiology and clinical characteristics of children with febrile seizure in hospital in 2016. So, the medical and nursing staff take them into account to take the needed action in the treatment of febrile seizures.

Methodology

This study was a retrospective descriptive cross-sectional study. In this study, all files of children admitted to the Parsabad and Germi Hospitals from April to March 2016 due to febrile seizure were studied. Cases with incomplete information, or patients who were discharged in less than 24 hours, or patients with signs of central nervous system infection or electrolyte and metabolic disorders, and feverless seizures, were excluded and finally, 148 cases were included in the study. In this study, after obtaining permission from competent authorities, data were collected using a researcher-made questionnaire. The questionnaire consisted of two parts. The first part included demographic information, and the second part contained 20 questions about the characteristics of seizure including the age of the first seizure attack, the type and duration of seizure, the frequency of convulsion, temperature during the seizure, family history and cause of fever and pre-seizure measures to reduce fever. Validity of questionnaire was evaluated using content validity method and was evaluated by faculty members of Ardabil University of Medical Sciences. The reliability of questionnaire was also obtained by using the observational method (r = 0.89). Data were analyzed using SPSS version 22 and statistical descriptive (mean and standard deviation) and analytical (Chi-square and T-test) methods.

Findings

The analysis showed that during one year, 148 children with febrile seizure were admitted to the two hospitals and compared to the total number of children admitted in the same year, the incidence of seizure was 6.25%. In this regard, 121 children (81.8%) had simple seizure and 27 children (18.2%) had partial seizure. Among these children, 87 (58.8%) cases were males and 61 (41.2%) cases were female. Chi-square test showed that, there is no significant relationship between sex of child and type of seizure (p = 0/27).

Investigating the duration of seizure showed that, in the majority of children, or in 65 cases (43.9%), seizure duration was less than or equal to 5 minutes. Previous history of seizure was negative in 116 children (78.4%) and was positive in 32 children (21.6%). Family history of seizure was positive in only 14 children (9.5%) and family history of epilepsy was positive in 8 children (5.4%) in the immediate family. Chi-square test showed a significant relationship between seizure type and previous history of seizure as well as seizure duration with seizure type (p = 0.000). However, there was no significant relationship between the duration of seizure with previous history of seizure.

In both types of simple and partial seizure, natural delivery was the most common type of delivery, however, the Chi-square test showed that there is no significant relationship between type of delivery and type of seizure (p = 0.09). In this study, 73 children (49.3%) had the first birth rank, 57

children (38.5%) had a second birth rank and 14 children (9.5%) had a third birth rank and four children (2.8%) had fourth or more birth rank. According to Chi-square test, there was no significant relationship between birth rank, type of delivery with seizure type, previous history of seizure in childhood and cause of febrile convulsion.

The average age of patients was 24.6 ± 15.15 months; the minimum age was three months and the maximum age was 66 months. Most of the cases, or about 50 children (33.7%) were in the age range of 1 to 2 years old and the lowest rate, or 3 children (2.1%) were in the age range of 5 to 6 years. The results of t-test showed that, there is a significant relationship between age of child and type of seizure ($p = 0.023$). So, complex seizure mostly occurred in older children. However, no significant relationship was found between the cause of febrile seizure and the age of child. Investigating the duration between fever onset and seizure occurrence showed that, in 126 children seizures occurred (85.1%) in less than 24 hours after the onset of fever. Chi-square test showed a significant relationship between duration of febrile seizure and seizure type ($p = 0.009$). However, no significant relationship was found between previous history of seizure and the cause of febrile convulsion. The average temperature of children with fever and seizure was 38.86 ± 0.85 ° C after first hospitalization; in children with simple seizure it was 38.969 ± 0.88 and in children with complex seizure it was 64.40 ± 91.9 ° C. T-test showed that, there is no significant relationship between average temperature and seizure type, previous history of seizure and cause of febrile convulsion.

Among the causes of fever in children with seizure, 58 cases of upper respiratory tract infection (39.2%), 27 cases of dysentery (18.2%), 24 cases of idiopathic factors, (16.2%), 16 cases of pneumonia (10.8%), 14 cases of urinary tract infection (9.5%), 5 cases of otitis media (3.4%) and 4 cases after vaccination (2.7%) were the most common causes of fever in children with febrile seizure. Chi-square test showed no significant relationship between the cause of fever in children with seizure type and previous history of seizure in children. In this study, Spring with 45 cases was the season with the most incidence of seizure (30.4%), after that winter with 37 cases (25%), autumn with 35 cases (23.6%) and summer with 31 cases (21%) were in the next rankings, respectively. Chi-square test showed that, there is no significant relationship between season of febrile convulsion, seizure type and previous history of seizure, but there is a significant relationship between the cause of fever and the season of febrile convulsion ($p = 0.0337$). In spring and winter, the most common cause of febrile seizure was upper respiratory tract infections and dysentery was the most common cause in Summer (Table 1 - next page).

The findings of mothers' demographic data showed that, the average age of mothers of children with convulsion was 28.54 ± 5.48 years old. 67 (45.3%) mothers had under diploma, 58 (39.2%) of mothers had diploma and 23 (15.5%) had university education. T-test showed that, there is no significant relationship between mothers' age with seizure type, previous history of seizure and cause of febrile seizure in children. Also, Chi-square test did not show a significant relationship between mothers' education and type of seizure, history of seizure and the cause of febrile seizure in children. 138 (93.2%) mothers mentioned the absence of perinatal problems, and only 10 (6.8%) mothers mentioned perinatal problems. 139 (93.9%) mothers mentioned the absence of a history of disease, and only 9 (6.6%) of mothers referred to diseases such as neurological problems, depression, diabetes, and previous history of seizure. 143 (96.6%) mothers mentioned non-smoking during pregnancy, and only 5 (3.4%) mothers mentioned the history of smoking during pregnancy. According to Chi-square test, no significant relationship was found between prenatal problems, history of disease in mothers, and smoking during pregnancy with seizure type, history of seizure and febrile convulsion.
126 (85.1%) mothers did some fever reduction measures before their children's seizure, and only 22 (14.9%) of them did not take any measures to reduce fever. 48 (32.4%) mothers tried to reduce the fever, using foot-bath and acetaminophen, 33 (22.3%) mothers only used acetaminophen, 8 (4.5%) mothers only used ibuprofen and 8 mothers (4.3%) used foot-bath and other medicines. There was no significant relationship between pre-seizure measures and seizure type, previous history of seizure and the cause of febrile convulsion (Table 2 - next page).

Discussion

In this study, 148 children with febrile convulsion with an average age of 24.6 ± 15.15 months were studied and the minimum and maximum ages were 3 and 66 months, respectively. 65.7% of children had febrile seizure in the first 2 years of life. Most studies confirm this case. In a study by Ghasemi et al most of the hospitalized children were between 9 months to 2 years (18). In a study by Fallah and colleagues, 66% of febrile convulsion cases were under 2 years (15). In a study by Khoda Panahandeh and colleagues, the average age of children with febrile seizure was 20.5 ± 9.8 months and the minimum and maximum age of children was 6 and 45 months, respectively (19). In a study by Bazegar and colleagues, the average age of children was 29.9 ± 21.2 months (14). In a study by Abbas khaniyan and his colleagues, the average age of children with febrile seizure was 5.1 ± 0.88, and the highest incidence was in the range of 1 to 2 years old (20). In a study by Namakin and colleagues, the average age of children was 25.5 ± 18.6 months and 61.8% of children with febrile convulsion were under 2 years old (16). The current study, similar to other studies, showed the higher prevalence of seizure following fever in children under the age of 2. Given that the child is at a very vulnerable stage in terms of physical and mental development, therefore, preventing seizure as much as possible and raising the awareness of parents are important measures in controlling seizures and preventing serious physical and mental harm. In the present study, there was a significant relationship between age and type of seizure, so that seizures occurred more often in older children. This finding contradicted the findings of Barzegar and his colleagues, and in their study

Table 1: Comparison of Variables with Febrile Seizure Type

Variables / Seizure Type		Simple Seizure	Complex Seizure	P-value
Average age (in month)		23/2±15/39	30/88±17/37	0/023
Sex	Male	(49.3 %)73	(%9/4)14	0/275
	Female	(%32/4)48	(%8/7)13	
Type of delivery	Natural delivery	(%42/5)63	(%13/5)20	0/094
	Cesarean section	(%39/2)58	(%4/7)7	
The most common cause of Febrile Seizure	Infection of respiratory system	(%33/1)49	(%6)9	0/265
	Dysentery	(%16/2)24	(%2)3	
Previous history of Seizure	Yes	(%12/8)19	(%8/7)13	0/000
	No	(%68/9)102	(%9/4)14	
Family history of febrile convulsion	Yes	(%7/4)11	(%2)3	0/746
	No	(%74/3)110	(%16/2)24	
Seizure duration	Less than 5 minutes	(%42/5)63	(%1/3)2	0/000
	Between 6 to 10 minutes	(%36/4)54	(%5/4)8	
	More than 10 minutes	(%2/67)4	(%11/4)17	
Duration of fever onset to seizure occurrence	Less than 24 hours	(%70/3)104	(%14/8)22	0/009
	More than 24 hours	(%11/5)17	(%3/4)5	
Average temperature		38/69±0/84	38/64±0/91	0/811
Previous history of hospitalization	Yes	(%19)28	(%8/7)13	0/009
	No	(%62/8)93	(%9/4)14	
Seizure fever season	Spring	(%24/3)36	(%6)9	0/802
	Summer	(%18/2)27	(%2/7)4	
	Autumn	(%19/6)29	(%4)6	
	Winter	(%19/6)29	(%5/4)8	

Table 2: Comparison of mother variables with febrile seizure type

Variables / Seizure Type		Simple Seizure	Complex Seizure	P-value
Mothers' age		28/52±5/35	28/37±6/26	0/859
Fever reduction measures	Without any measure	(%10/8)16	(%3/4)5	0/704
	Foot-bath	(%18/2)27	(%4)6	
	Acetaminophen	(%15/5)23	(%5/4)8	
	Ibuprofen	(%4/7)7	(%0/6)1	
	Foot-bath and Acetaminophen	(%27/7)41	(%4/7)7	
	Foot-bath and other medicines	(%4)6	(%0)0	
	Other medicines	(%0/6)1	(%0)0	
Mothers' level of education	Under diploma	(%34/4)51	(%10/8)16	0/133
	Diploma	(%35/1)52	(%4)6	
	University education	(%12/1)18	(%3/4)5	
Drug abuse during pregnancy	Yes	(%3/4)5	(%0)0	0/283
	No	(%78/3)116	(%18/2)27	

complex seizures mostly occurred in children with lower age (14). In some other studies, no significant relationship was found between age and type of seizure (21, 16). These differences in results can be due to the difference in the number of samples in different studies. In this study, the incidence of febrile convulsion in males was more than females, which is similar to the results of other studies. They showed that the febrile convulsion prevalence was higher in boys than in girls (1,20,21,22). Therefore, male sex can be considered a risk factor for fever and seizure occurrence.

In the present study, 21.6% of children had a history of febrile convulsion. In the study of Fallah and colleagues, 29%, and in the study of Mohammadi and colleagues, 34% of children had previous history of seizure (15 and 1). In this study, 9.5% of children had a family history of seizure and only 4. 5% of children had a family history of epilepsy in their immediate family, while in other studies it was reported at about 20-30%. This difference can be due to the lack of memory of parents regardingchildhood seizures or the refusal to express their own history of seizure due to cultural and personal issues (23 and 24). There was no meaningful relationship between febrile seizure and family history of seizure in the present study. However, there is a significant relationship between the previous history of seizure in children with current type of seizures, so that complex seizures are more common in these children. This finding was consistent with the results of studies by Sanaei Dashti and his colleagues (25). According to studies, one third of children with febrile seizure will experience its recurrence and 10% of children will have three or more seizure attacks. Age is the most important risk factor in recurrence of febrile convulsion and in the first seizure the lower the age, the risk of recurrence is more (26). Considering that in this study, the age of most children is between the ages of 1-2, serious measures should be taken to prevent the occurrence of serious complications in the child. In the present study, most children had simple febrile seizures. In other studies, this finding is also confirmed (14,15,20,21). It can be concluded that epidemiologically, the prevalence of simple seizure is more than complex seizure in children with febrile seizure. In the majority of children in this study, the duration of seizure was less than 15 minutes. In the study of Khoda Panahande, 85% of cases of seizures were less than 15 minutes, and in the study of Bazgar and colleagues, 94.1% had seizures less than 15 minutes, which is consistent with the results of this study (7.14). Since the prevalence of fever attacks and simple seizures was higher in this study, one of the main attributes of this kind of attack is the duration of attack, which should be between 10-15 minutes.

In the present study, 85.1% of children had seizure during the first 24 hours after the onset of fever. This finding is also confirmed by other studies, and over 80% of seizures occurred in the first 24 hours after onset of fever (27, 20, 16, 14). The results show that, in the case of fever in a child, the first 24 hours is the most probable time for the occurrence of seizure and this should be taught to parents to try to reduce fever in different ways or transfer the baby to the nearest health center.

In this study, seizure prevalence mostly occurred in Spring, then Winter, Autumn and Summer, respectively. In the study of Abbaskhaniyan et al., the highest prevalence of febrile convulsion was in Winter (68.4%) then Autumn, Summer and Spring, respectively (20). In the study of Amini et al., the highest prevalence of febrile convulsion was in Summer (43.9%), Spring (43.6%), Winter (42.7%) and Autumn (35.7%), respectively (11). This could be due to climatic differences in the studied areas.
In the present study, the most common cause of fever in patients was upper respiratory tract infections and diarrhea. In the study of Imani et al., the most common cause of febrile seizure was unknown fever and then upper respiratory tract infections (21). But in the study of Abbaskhanian, Falah and colleagues, the results were exactly the same as the results of the present study (20 and 15). Different results may be due to different climatic conditions and common diseases of each region in different seasons.

Conclusion

This study showed that, the prevalence of febrile convulsion in Germi and Parsabad towns was 6.25% during a year. It was more common in children less than 2 years old and in males, and simple seizure type was more common. There was a significant relationship between previous history of seizure, duration of seizure, age of child, duration of fever onset to seizure occurrence and type of seizure.

Febrile convulsion is a common neurological disorder in children and is one of the reasons for child hospitalization. Hence, providing accurate evidence of attacks over time can help to identify potential triggers and factors accelerating attacks. So, in this way we can control the recurrence of attacks and reduce the incidence of seizure events in children. Based on the results, febrile convulsion occurrence can be prevented in children by identifying risk factors and those who had a previous history of disease and by providing training to parents.

References

1- Mohammadi R, Rostamnejad M, Seyedjavadi M, Allahyari I, Mazaheri E. Knowledge and Practice of Mothers of Children with Febrile Seizure in Bou Ali Medical Education Hospital in Ardabil. Journal of Health and Care. 2010.12(2):15-21.
2- Farell K. The Management of Febrile Seizures. BC Medical Journal. 2011; 53(9): 268-273.
3- Commission on Epidemiology and Prognosis, International League against Epilepsy. Guidelines for epidemiologic studies on epilepsy. Epilepsia. 1993; 34:592-8
4- Mohammadi M. Evidence Based Approach to Children with Fever and Seizure. Iran J Pediatr. 2002; 3(12): 3-8.
5- Waruiru C, Appleton R. Febrile Seizures: an Update. Arch Dis Child. 2004; 89(8): 751-6.
6- Moayedi A, Nazemi Gheshmi A, safdariyan F. Etiology and Epidemiology of Febrile Convulsion in Children Admitted to Pediatric Hospital in Bandar-Abbas. Medical

Journal of Hormozgan University. 2005; 9(3):159-156.
7- Khoda Panahandeh F, VahidHarandi N, Esma'ili Jazanabadi F. Evaluation of Seasonal Variation and Circadian Rhythm of Febrile Seizures in Children Admitted to the Pediatric Ward of Rasoul -e-Akram Hospital. Journal of Iran University of medical science. 2008.15(59):59-65.
8- Bron JK. Minns RA. Chapter of Neurology Campbell A.G.M Mcintosh Neil Forfar Textbook of paediatrics. 15 th Edition Churchill Livingston Company. 1998: 682-684.
9- Johnson EW. Dubovsky J. Rich SS. et al. Evidence for a Novel Gene for Familial Febrile Convulsions. Hum mol Gene. 1998. 7(1): 63-7.
10- Offringa M. Bossuyt PM, Lubsen J, Ellenberg JH, Nelson KB, Knudsen FU and et al. Risk Factors for Seizure Recurrence in Children with Febrile Seizures: A pooled analysis of individual patient data from five studies. Journal of pediatrics. 1994; 124(4): 574-84.
11- Amini AG, Kazemi A, Ghorbani A. Causes of Seizure in 1 Month to 15 Years Old Children in Isfahan. Iranian J Neurol. 2009; 24(7): 355-60.
12- Menkes HJ, Sankar R. Paroxysmal disorders. In: Menkes JH, Sarnat HB. Child Neurology, 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2000: 919-1026.
13- Aicardi J. Diseases of the Nervous System in Childhood: epilepsy. New York: Raven press; 2009: 253-753
14- Barzegar M, Kargar MH, Keivancher N. Epidemiologic and Clinical Features of First Febrile Convulsion in Children. Med J Tabriz Univ Med Sci. 2006; 28(4): 17-21.
15- Fallah R, Akavan-Karbasi S, MirNaseri FAS. Evaluation of Demographic and Clinical Characteristics of First Febrile Seizures in Children. J Shahid Sadough Univ Med Sci .2009; 16(5): 61-65.
16- NamakinGh, Sharifzadeh R, Rezaee S. Demographic and clinical characteristic of febrile convulsion in children admitted in Valiasr hospital of Birjand. J BirjandUniv Med Sci .2010; 17(4): 281-287.
17- SajadiHazaveh M, Shamsi M. Knowledge, Attitude and Practice of Mother Trying to Prevent Febrile Convulsion in Children in Arak. Journal of Urimia Nursing and Midwifery Faculty. 2011; 9(2): 76-83
18- Gasemi F, Valizadeh F, Mohsenzadeh A. Educational needs of mothers of children with febrile seizure. Journal of Khorramabad Nursing and Midwifery Faculty.2005; 1(1): 43-48.
19- Khodapanahandeh F. A Survey on 107 Children with Febrile Convulsion in Firooz-Abadi Hospital. RJMS. 2001; 8 (25): 269-272.
20- Abbaskhanian A, Rezai M S, Ghafarri J, Abbaskhani Davanloo A. Epidemiology and Clinical Pattern of First Attack of Febrile Seizure in Children. J Mazand Univ Med Sci. 2012; 22(94): 36-42.
21- Imani E, Khademi Z, Naghizadeh F, Askarnia M. Etiology and Characteristics of Febrile Convulsion in Children Admitted to Pediatric Hospital. Journal of health & care. 2012; 12(1&2): 61-68.
22- Imani E, Khademi Z, Naghizadeh F, Askarnia M, Imani A. Epidemiology of Seizure in Children of Bandar Abbas in 2008 Year. Iranian Journal of Epidemiology. 2012; 8(2): 48-53.
23- Bessisso MS, Elsaid MF, Almula NA, Kadomi NK, Zeidan SH, Azzam SB, et al. Recurrence Risk After a First Febrile Convulsion. Saudi Med J. 2001; 22(3): 254-258.
24- Ashrafzadeh F, Hashemzadeh A, Malek A. Acute Otitis Media in Children with Febrile Convulsion. The Iranian Journal of Otorhinolaryngology 2004; 16(1): 33-39.
25- SanaeiDashty A, Akhlaghi A K, Pazoki R. Clinical Risk Factors of Febrile Seizure in Children in a University Hospital in Bushehr port. Iran South Med J. 2007; 9 (2): 168-174.
26- Behrman RE, Kliegman RM. Paroxysmal disorders. Nelson Essential of Pediatric. Philadelphia, Saunders; 2013.
27- Ehsanipour F, Khodapanahandeh F, Aslani Z. The Prevalence of Meningitis in Children with Febrile Seizure Hospitalized at Hazrat Rasoul Hospital (1997-2002). RJMS. 2005; 11 (44): 907-911.