Factors that may Anticipate Febrile Convulsion

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Abstract:

Febrile Convulsions are the most common seizure disorder in children under five years of age. This study was conducted to determine the risk factors that might potentiate febrile convulsion.

Methods: *This case-control study was carried out in Pediatric Department, Zawia Teaching Hospital over the period from 1st of January 2002 to 31st of December 2009. Data of 154 cases with febrile convulsion admitted to the Department, aged 6months- 6years were matched with other 154 patients having fever without convulsion with the same age range, presenting during the same period.*

Results: *The febrile convulsion accounts for 8.5 % of total admission. Febrile convulsions were slightly more common in males than females (1.2 : 1) and the mean age of presentation was 17.5 ± 8.8 months and for the control was 17.6±8.54 months. 75 % 0f patients has febrile convulsion for the first time and 25 % had recurrent febrile convulsion. The peak of cases were between 15-22 months and more common during Autumn season . In 26 % of the children there was positive family history of febrile convulsions and 23.4 % has family history of epilepsy and mental retardation.*

Conclusions: *Febrile convulsion is a common cause of admission and the majority of cases of febrile convulsions occur in second year of life. The presence of family history of febrile convulsion , epilepsy or mental retardation, history of prematurity and anemia tend to be risk factor for occurrence of febrile convulsions.*

Keywords*: Febrile convulsions****(FCs),*** *risk factors*

Introduction:

Febrile convulsion is the most common type of seizure in children, occur in 2-4 % of children under the age of five years.(1,2) They are generally of excellent prognosis and usually occurring in children with age between 6 months and 5 years precipitated by fever arising from infection outside the nervous system.

F C usually occurs early in the course of febrile illness and is often the first sign and usually develop when the core temperature reaches 39 °C or higher. (3) F Cs are classified as either simple or complex. Simple F Cs, are most common types (80%) and they are generalized tonic- clonic,

of duration lasts less than 15 minutes, do not occur more than once in a 24-hour period , and not followed by neurological deficit. Complex F Cs may be focal, prolonged, or recurrent within the same febrile illness, and associated with post ictal neurological abnormality including Todd's paralysis.

There is a genetic predisposition to FC supported by both twin and family studies, which indicates a higher concordance rate in monozygot twins than in dizygotic twins.(4)

Familial clustering studies demonstrate a double sibling risk when both parents had FC (55.6%) compared with a risk of 21.7% when only one parent was affected and 5.5% when both parents were not affected. (5). Recently three FC gene loci , FEB1(chromosome 8q) , FEB2 (chromosome19p) and FEB3(chromosome 2q) were mapped, which is strongly supporting evidence of genetic susceptibility (6,7,8). The exact role of fever in the etiology of F C is not clear and the definitive degree of fever is uncertain. Suggested risk factors include maternal smoking during pregnancy, prolonged neonatal hospital admission, iron deficiency anemia below age of 2 years, zinc deficiency and immune deficiency. (8,9,10).

The aim of this study was to determine the possible risk factors for FC among children attending Zawia teaching hospital.

Methods :

This case control study was done in the Pediatric Department, Zawia Teaching Hospital over eight years from 1st of January 2002 to 31st of December 2009 . Data of 154 patients with febrile convulsion, admitted to the department, aged 6months-6 years, were matched with other 154 patients having fever without convulsion with the same age

range, presenting during the same period. Diagnostic criteria for febrile convulsions (based on AAP Clinical practice Guidelines) included convulsions associated with fever, children are healthy without any evidence of CNS infection and metabolic disorders.(11).

Data were collected regarding the present child's illness , neonatal history, immunization, developmental milestone, family history of FC , epilepsy and mental retardation. Weight and head circumference were recorded , full systemic examination and axillary temperature were done for all patients. Blood sugar, serum calcium and full blood count were done. PCV values below 33 % were considered anemic according to Who definition .(12). Statistical analysis for collecting data was performed using the EpI info version 6 soft package. Data were presented in frequency, percentage, mean, and standard deviation. Student test and chi square test were used for the significant testing with P value < 0.05 as level of significance.

Results :

154 cases and 154 control were included in the study. The mean age of cases and control was 17.5 ± 8.8 and 17.6 ±8.54 months, respectively. This statistically not signifant (P value > 0.05). 115 of cases(75%) had febrile convulsions for the first time and 25 % had recurrent FCs. The mean temperature is highly significant difference between cases and control.

In cases, male account for 54% and female for 46% (male to female ratio 1.2:1) while in control patients less than that(0.9 :1). Twenty sex percent of cases had positive family history of F Cs compared to 13 % of control and this found to be risk factor for FCs (p value =0.004). in

addition, 23.4 % of cases compared to 11% of control had family history of epilepsy and mental retardation, this also found to be a risk factor FCs.

In cases also , history of prematurity account for 25.3% and this found to be strong risk factor for FCs with P value 0.002 while neonatal intensive care admission variable not significant risk factor.

Also anemia was found to be a strong risk factor for FCs as it present in 63.6 % of cases compared to 24.7 % of control(p value 0.001).

Variable	***Case N 154***	***Control N 154***	***P- value***
Mean age	*17.5±8.8*	*17.6±8.54*	*0.9*
Male	*83 (54%)*	*73 (47.4%)*	*0.524*
preterm	*39 (25.33%)*	*12 (7.79 %)*	*0.002*
NICU admission	*46 (29.87%)*	*37 (24 %)*	*0.248*
Family history of FC	*40 (26%)*	*20 (13%)*	*0.004*
Family history of Epilepsy& MR	*36 (23.4%)*	*17 (11%)*	*0.004*
Temperature on admission	*39±0.7°C*	*38.9± 0.5°C*	*0.001*
Anemia	*98 (63.6%)*	*38 (24.7%)*	*0.001*

This table shows the significant risk factors

Discussion:

In this study, FCs account for 8.5 % of total admission and the majority of cases occur in the second year of life, peak at 15-22 months. This in consistent with the results of other studies.(1,2).

The mean age for those with first febrile seizure was 17.5 months; this figure is similar to that found by Al-Eissa.(13).

Other study by Al zwaini revealed even higher figure of 23.5 months. (14) .

Male account for 54 % of cases with male to female ratio of 1.2:1 in this study . another studies revealed higher ratio than what this study shows.(14,-16)

Twenty six percent of the cases were found to have family history of febrile convulsions and when compared with controls were found statistical significance (P value 0.004). This finding is in agreement with those studies that showed strong evidence of a positive family history as risk factor of FCs. (9,14, 17)

Family history of epilepsy and mental retardation was also found a risk factor for FCs (p value 0.004). This is similar to the result of Al-zwaini et al and Fernandez et al. (14, 18)

In our study, FCs are more common during Autumn which reflect the association with viral infection. Many studies revealed most cases of FCs were due to viral infection. (19,20)

In this study anemia was found as a significant risk factor fo FCs . The association between iron deficiency anemia and FCs was studied by many authors, some of them confirm this association .(21,22)

A considerable number of infants in this study were premature and when compared with the control, prematurity was found to be a significant risk factor(p value 0.002). This is similar to the result of

Al-Sweidi et al. (23) In a community based case control study from Sweden, premature birth and neonatal hyperbilurbinemia were more common in cases.(24) However, admission to intensive care baby unit is not a risk factor.

The study does have limitations as it was a hospital based study where the prevalence of risk factors and outcome variables may be different from community setting.

Conclusions :

From this study we itcanbe concluded conclude that the major risk factors for FCs are history of prematurity, positive family history for FCs , epilepsy or mental retardation and anemia.

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