



Iron Deficiency And Convulsion In Children

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Introduction

Febrile seizure is the most common convulsion disorders in children, between 3 to 60 months of age. Child will become stiff or their arms and legs may start to twitch with lose consciousness and may wet or soil themselves and may also vomit and foam at the mouth, and their eyes may roll back. The exact cause is unknown but the high temperature usually those greater than 38 °C (100.4 °F) can be caused by an infection. There may also be a genetic link to febrile seizures and the chances of having a seizure are increased if a close family member has a history of them. Some studies have reported that iron deficiency could be a risk factor for febrile seizure. The present study was conducted to compare the rate of iron deficiency anemia in febrile children with and without seizure.



Methods and Materials

This case-control study evaluated 200 children aged 6-60 month (6 months to 5 years) with normal development in two 100 person groups (febrile seizure and febrile without convulsion). In all cases, after the goals of the study were explained to the parents, they were asked to sign the consent form. Personal information about the children, including age, gender and family history of seizure were collected from parents through an interviewed questionnaire.

In both groups, body temperature was also measured and recorded by axillary method. The blood tests of CBC , serum Iron, and TIBC were conducted. Anemia was defined as Hb < 10.5g/dl for children from the age of six months to two year olds, and Hb < 11.5g/dl for 2-5 years old children. The normal level of serum iron was determined as Fe > 40 µg/dl for children younger than one year and Fe > 50 for children over one year. The normal range of TIBC was considered 210-430 µg/dl. The normal transferrin saturation percentage was considered higher than 15 percent. Diagnosis of iron deficiency anemia based on mentioned criteria.

Results

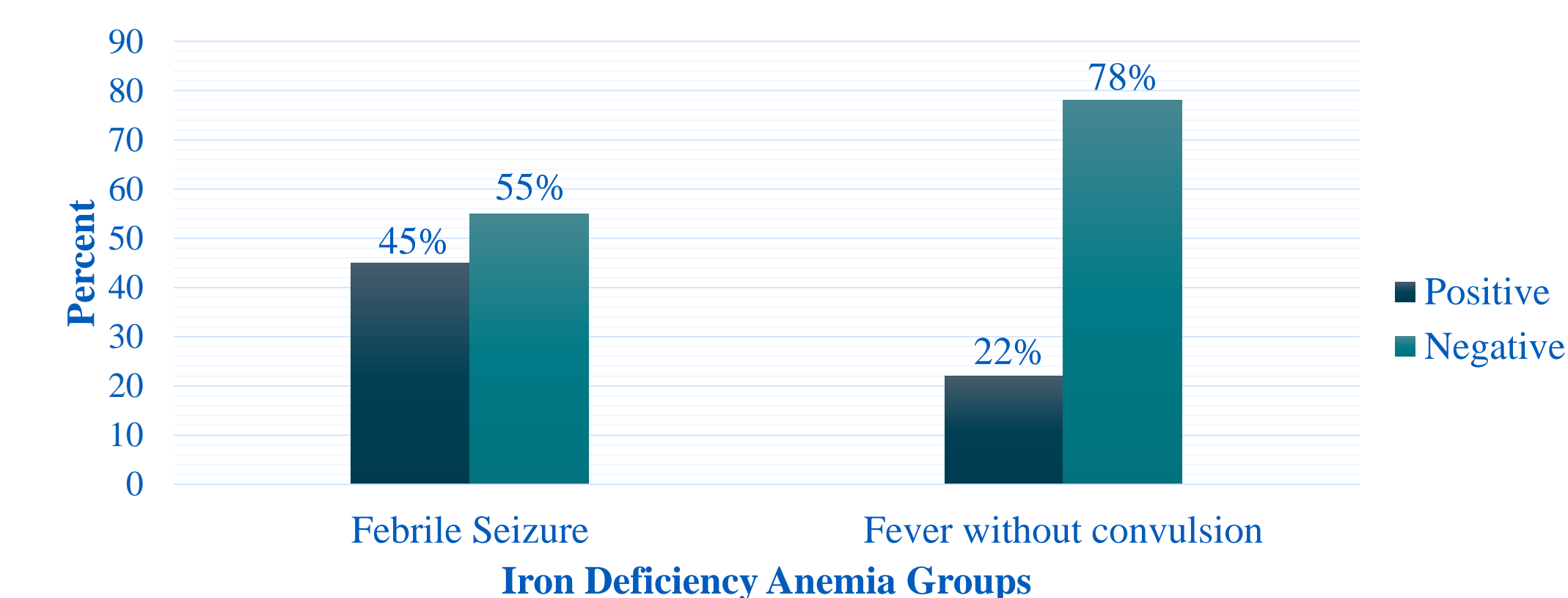
When studying the personal characteristics, no significant differences were found in two groups in terms of age, gender. Regarding the family history of convulsion, there was a significant difference between the study groups. In two groups there is no significant difference in terms of the disease causing the fever. The diseases causing the fever in both groups were respiratory and digestive infections.

Personal Information	Group	Febrile seizure	Fever Without convulsion
Gender	Boy	62	56
	Girl	38	44
Family History of seizures	Yes	27	10
	No	73	89
Infectious Disease Type	Respiratory	64	60
	GIT	33	38
	Others	3	2

The average of serum Iron and TIBC were significantly different in two groups

Group Iron Anemia	Febrile seizure	Fever Without convulsion
Hb	11.45 ± 1.34	11.82 ± 1.45
Serum iron	42.62 ± 28.02	52.45 ± 34.76
TIBC	393.22 ± 39.61	345.94 ± 26.82
Transferrin saturation percentage	12.77 ± 8.26	14.41 ± 10.60

The presence of iron deficiency anemia was 45% in the convulsion group, 22% in the group with fever without convulsion. The Chi Square test indicated a significant difference between the groups.



Discussion

In this study, the incidence of iron-deficiency anemia in the febrile convulsion group was obviously higher than the control group. Like this research:

- Study of Vaswani, 68% of cases were iron deficient compared to 30% of the controls.
- Study of Sadeghzadeh, although anemia was not common among febrile seizure patients, iron deficiency was more frequent in these patients.
- Study by Ur-Rahman and Billoo on 30 children with febrile convulsion and 30 children with other febrile diseases indicated that iron-deficiency anemia in the case group was significantly more common than in the control group.

This study, can simply assess its role in increasing the iron and in the reduction of febrile convulsions. Some studies have reported findings that are not similar to the result of this study:

- Study of Kobrinsky, the febrile convulsion group suffered less from iron deficiency. They concluded that iron deficiency could have a protective effect against febrile convulsions

- Paper by Bidabadi, iron deficiency in the febrile convulsion group (44%) was less than in the control group (48%).

The major causes that lead to different results between studies, include the difference in the age, number of samples, and the diagnostic criteria of anemia. In this study, all cases suffered from the febrile convulsion for the first time, but in most of the mentioned studies, some samples had a history of febrile convulsion. According the findings of this study, the incidence of iron deficiency in children with fever and convulsion is more than that the fever without convulsion group. That suggest low iron levels and the presence of anemia can serve as factors for the febrile seizures in children. Thus, iron deficiency can be added to the list of risk factors for febrile convulsions. Accordingly, children with febrile seizures are suggested to be monitored for diagnosis and treatment of iron-deficiency anemia.

Conclusion

The findings suggest that a considerable percentage of children having febrile seizure suffer from iron-deficiency anemia and low serum iron. This means the low serum iron and presence of anemia can serve as a reinforcing factor for the febrile seizure in children.

References

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