



CASE REPORT ON IRON DEFICIENCY ANAEMIA WITH FEBRILE SEIZURE

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ABSTRACT

Febrile Convulsions (FC) refer to the convulsions that occur in children between the ages of 6 months and five years, with body temperature of 38°C or higher not resulting from Central Nervous System (CNS) infection or any metabolic imbalance without any prior afebrile seizures. This condition occurs in 2-5% of the children who are neurologically healthy.^[1] The precise cause of FC is not known, but several genetic and environmental factors have been implicated.^[2] The maximum age of FC occurrence is 14-18 months, which overlaps with the maximum prevalence of Iron Deficiency Anemia (IDA) which is 1

-2 years old.^[3] Febrile seizure (FS) is a common cause of seizure in young children and occurring in 3-4% children under 5 years of age. Iron deficiency is reported as commonest micro-nutritional deficiency worldwide and has been associated with febrile seizures.^[4] We report a case of 1 year old female child who presented with the complaints of 2-3 episodes of loose motion and one episode of seizure with genetic predisposition of iron deficiency anemia.

KEYWORDS: UTI, Febrile Seizure, Iron deficiency anaemia.

INTRODUCTION

Febrile seizure is the most common convulsion disorder in children which occur 2–5% worldwide. febrile seizures are a form of acute symptomatic seizure occurring between ages 5 month and 5 years, associated with fever but without any evidence of intracranial infection or other defined causes of seizures.^[5,6]

Febrile seizures, though has excellent long term prognosis with risk of epilepsy in less than 1% but occurrence of seizures can lead to increased morbidity and mortality because of risk of aspiration and hypoxia during prolonged febrile seizures. Therefore it is attempted to identify the risk factors associated with febrile seizures and their recurrence including, family history of febrile seizures, degree of rise of temperature with seizures threshold, Perinatal factors and iron deficiency anemia.^[7,8]

IDA is the most common nutritional deficiency in the world. Iron is an important micronutrient which is used by roughly all the cells in the human body. It is well understood that iron is a cofactor for several enzymes in the body and has a role in the neurotransmitters production and function, hormonal function and DNA duplication.^[9] Iron deficiency stimulates the function of neurons and, consequently, increases the risk of convulsions.^[10]

Considering the age prevalence of iron deficiency anemia and febrile seizures, which are the same, role of iron has been studied. Some studies deduced that iron deficiency might have protective role on febrile seizures. Other believed that in patients with iron deficiency anemia there was a higher incidence of febrile seizures.^[11]

Febrile seizures affect 2–4% of all children and have a strong genetic component. Recurrent mutations in three main genes (*SCN1A*, *SCN1B* and *GABRG2*).^[12,13,14] have been identified that cause febrile seizures with or without epilepsy.

CASE REPORT

A 1 year old female child was admitted in pediatric ward from another hospital with complaints of 2-3 episodes of loose motion, one episode of seizure. Her family history shows genetic predisposition of anemia. The laboratory examination reveals the abnormality in MCV, MCH, MCHC, Hemoglobin, Serum iron, to a greater extent indicates Iron deficiency anemia. During on the 1st admission she was given with Inj.Ceftriaxone for Urinary tract infection as the urine examination reveals the presence of pus cells, which leads to the occurrence of loose motion, it is an Adverse drug reaction of Inj.ceftriaxone. Later the child was treated with Enterogermina and Syp.Nitrofurantion. Even though she was not prescribed with any anemic medications.

DISCUSSION

Febrile seizures [FS] are the most common seizures in children. Their incidence is range between 2-5 %.^[15] Febrile seizures is more common in boys, usually manifesting as tonic-clonic convulsion.^[16] Although FS is benign and rarely leads to brain damage, it causes emotional, physical, and mental damages, which are stressful for parents, and affects families' quality of life.^[17,18]

Some recent studies have reported that iron deficiency anemia (IDA) could be a risk factor for FS, because the latter is more common in children under two years of age and IDA is also common in children of the same age. Iron plays a critical role in the metabolism of several neurotransmitters, and in low iron status, aldehyde oxidases and monoamine are reduced. In addition, the expression of cytochrome C oxidase, a marker of neuronal metabolic activity, is decreased in iron deficiency. It is interesting to note that reduction in the levels of several neurotransmitters, monoamines and aldehyde oxidase is also critically associated with iron deficiency which proved to influence normal behavioral and developmental processes.^[19,20]

Anemia is the most common clinical manifestation of iron deficiency, but other organs and systems may also be affected. Cognitive dysfunction, psychomotor retardation, behavioral problems, pica, breath holding spells, restless leg syndrome, and thrombosis could be associated with iron deficiency. The effect of iron deficiency in a developing brain and mechanisms such as altered development of hippocampus neurons, impairment of energy metabolism, delayed maturation of myelin, slowed visual and auditory evoked potentials, and alterations in synaptic neurotransmitter systems including norepinephrine, dopamine, glutamate, gamma-aminobutyric acid (GABA), and serotonin may be responsible for these symptoms.^[21,22]

The cause of febrile seizures is multifactorial in nature and whereas there is increasing evidence for susceptibility genes, we know no single gene to be responsible. Identification of genetic mutations has been successful in certain groups of children prone to recurrent febrile seizures, particularly those with SCN1A mutations often associated with family members with Dravet syndrome and Generalized Epilepsy with Febrile Seizures Plus (GEFS+).^[23, 24]

CONCLUSION

Early detection and timely correction of iron deficiency may be helpful for prevention as well as recurrence of febrile seizures in children of this age group.

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