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Iron deficiency anemia presenting with behavioral problem in prolonged exclusive breast– fed infant.

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Abstract :

Iron deficiency is a common nutritional problem in infants and children and in adolescents with obesity. Exclusive breast feeding for prolonged period can result in iron deficiency anemia in late infancy and early childhood (1).

Iron deficient children during development are particularly prone to impaired cognitive and behavioral functions. Verbal learning and memory can be affected in these children (2,3).

Infants and children with iron deficiency state are also found to score low on mental development index (MDI) in Bailey scales of infant development (BSID), and scores of such infants usually increase after proper iron therapy (1,4).

We present here a baby boy of 2 yrs who attended the outpatient clinic due to fidgety and overactive behavior for previous 5 to 6 months. He had a normal growth and development after a normal birth and postnatal period. He had been given exclusive breast feeding by his mother since his birth without any attempt to wean him. On evaluation he was found to have moderate iron deficiency anemia. He was treated with oral iron in a therapeutic dose and gradual weaning from breast milk of his mother and introduction of other nutritional supplements. He showed clinical and hematological improvement in following 2 months. His behavioral problem and fidgetiness also improved.

Case report:

A 2 yr old boy, the first child of non-consanguineous parents from a lower socio-economic community presented with history of multiple episodes of breath holding spell and fidgety behavior for a period of 5- 6 months. He did not have any history of convulsion, fever or chronic diarrhoea. Earlier, the baby suffered from two episodes of febrile seizure, one at his 6 months of age and other at 10 months, both of which responded to treatment with paracetamol and diazepam (prn) for 2 -3 days during the febrile paroxysms. The parents also complained that the baby was inattentive and overactive and he would not listen to his parents and relatives. Dietary history revealed that the boy had been exclusively breastfed by his mother since his birth and was not given any other food or milk/milk product as the baby would not take anything except breastmilk from his mother. There was no history of any bleeding disorder or passing blood with stool or urine. There was no history of PICA or ingestion of lead containing substance what so ever.

His birth and neonatal history was unremarkable. Growth and developmental history, as obtained from the parents, did not reveal any significant

abnormality. The baby was immunised according to schedule from birth till date.

On examination, his growth parameters (weight 10 kg, height 83 cm, head circumference 47 cm, chest circumference 45 cm) were within normal range. His developmental milestones since birth were not delayed or abnormal. He could follow 2 step command and build a tower of 6 cubes, and walk alone, run with occasional fall, and climb upstairs holding railing one step at a time.

General examination showed moderate pallor.

Icterus, clubbing, edema were absent.

Systemic examination of chest, abdomen and cardio vascular system were normal. There was no hepatosplenomegaly.

He showed inappropriate behavior and impaired attention, but his motor skills were normal. His language development was normal as could follow 2 step command and speak 2 word sentences.

Hematologic investigation including peripheral smear showed moderate microcytic, hypochromic anemia (Hb 7 gm/ dl, PCV 20%, RBC count 3.2 million /cu mm). MCV was 64, MCHC 27% (approximately). No basophilic stippling found in RBC, and serum lead level was normal. There was no abnormal or immature cell in blood. Reticulocyte count was normal.

Serum iron was low (14 mcg/ dl) with increased TIBC (468), and low ferritin (11 nanogram / ml).

His liver function and renal function tests did not show any abnormality.

Electroencephalogram (EEG) was normal.

A diagnosis of iron deficiency anemia was postulated and the cause considered was nutritional deficiency due to prolonged exclusive breast feeding leading to insufficient iron supplements in his feeding.

The baby was treated with oral iron 5 mg elemental iron per kg body weight per day in 2 divided doses. This was continued for 2 months after which his hematological parameters became normal. During this period his parents were counselled to gradually wean the baby from breast milk and to supplement his diet with cereals like soft rice, roti and dal, suji, etc. Oral iron therapy was continued prophylactically in a dose of 2 mg elemental iron per kg per day for another 2 months. After 2 months the baby showed significant improvement in attention and hyperactive behavior.

Discussion :

The 2 yr old boy presented with fidgety behaviour and anemia. Iron deficiency was the cause of anemia as his serum iron and ferritin were decreased and TIBC was elevated. Low MCV and MCHC were consistent with microcytosis and hypochromia respectively. Thalassemia and hemoglobinopathies were excluded due to absence of hepatosplenomegaly, and normal hemoglobin electrophoresis. Absence of pica and basophilic stippling of RBC excuded lead intoxication.

Prolonged exclusive breastfeeding extending beyond 1 yr of age can predispose to iron deficiency due to lack of cereal containing food in infant's diet (1). Though breast milk iron has a good bioavailability, about 50 percent of ingested iron in breast milk get absorbed in small intestine, it may be insufficient to provide adequate iron to the baby after 9 to 15 months of life unless some cereal containing food is added to the infant's diet with weaning (1,2).

Incidentally,the parents of the baby sought

medical advice predominantly due to the behavioural disturbance, which is prone to occur in iron deficiency (3,4).

Oral iron therapy continued for 6 to 8 wks after hematologic improvement can replenish the stored iron and also result in improvement of behaviour and intellectual function in young children (4,5,6).

Conclusion :

Prolonged breastfeeding and delayed weaning without supplements can lead to iron deficiency anemia in infants and young children. Those with anemia should be initially evaluated for having iron deficiency and treated accordingly. Proper and timely weaning from breast milk and introduction of cereal in baby's diet should protect the baby from nutritional iron deficiency anemia.

Also, infants and children with behavioral disturbance should be evaluated for associated iron deficiency anemia and treated accordingly before being levelled as attention deficit hyperactive disorder (ADHD).

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