Spectrum of Iron Deficiency Anemia at Children's Hospital & Research Center at Oakland

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Synopsis:

We wish to determine the number and age-distribution of children with iron deficiency seen in the hematology clinic at Children's Hospital and Research Center Oakland.

Iron deficiency is a multi-system disorder with profound effects on the central nervous system. Numerous studies during the past 20 years have clearly defined an effect of iron deficiency on mental development and often on motor functioning as well. The reduced activity of iron-containing enzymes in the central nervous system leads to deficits that appear to be irreversible despite iron therapy. It is imperative that pediatricians and other professionals caring for infants and young children be more attentive to good nutritional practices. In particular, everything possible must be done to assure adequacy of iron intake during the first 18 to 24 months of life. There are a number of means of assuring iron sufficiency: avoid whole cow's milk during infancy, using iron-fortified cereal, limiting whole cow's milk intake in second year and encouraging meat and iron-rich vegetables.

The National Health and Nutrition Examination Survey III (NHANES III), a multistage, stratified population survey of children aged 12–35 months, found a prevalence of IDA of only 3% using a panel of indicators of ID (two or more of ferritin ‹10 µg/l, transferrin saturation ‹10%, erythrocyte protoporphyrin ›1.42 µmol/l red blood cells and Hb ‹110 g/l). About 9% of this population had ID with at least two of the iron indicators being abnormal but with normal Hb. However, a recent analysis of this data indicates that anemia (defined as Hb ‹110 g/l) is an insensitive maker of ID with a low predictive value of 29% and sensitivity of 30%, i.e. most anemic toddlers do not have ID, and most toddlers with ID are not anemic. Iron deficiency occurs in infants and young children of all races and ethnic groups. Although iron deficiency during infancy and early childhood is usually due to reduced iron intake, the primary cause of iron deficiency can occasionally be gastrointestinal hemorrhage, malabsorption of iron—which can be due to intrinsic bowel disease, chronic giardiasis, or isolated iron malabsorption in an otherwise well child—or intrapulmonary bleeding accompanying idiopathic pulmonary hemosiderosis.

The ideal strategy is breast-feeding for at least the first 6 months of life. Although human breast milk contains little iron (‹1.0 mg/L), the bioavailability of iron is high; that is, 50% of the iron is absorbed. However, by 6 months of age, exclusively breast-fed infants have depleted iron stores and by 9 to 12 months of age exhibit frank iron deficiency anemia. This necessitates that additional sources of iron be provided.

The American Academy of Pediatrics recommends screening for anemia in term infants between 9 and 12 months of age. Despite the screening, iron deficiency continues to be common in young children which indicates that the current strategy is not efficient in the prevention of this complication in the age-group with the highest risk, children between 18-24 months of age.