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IRON DEFICIENCY ANEMIA*

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Iron is essential for life, and iron deficiency is probably the most common nutritional problem in early life today. Consequently, iron deficiency anemia is by far the most common form of anemia in the pediatric age group. This preventable nutritional disorder is prevalent all over the world and especially in medically less organized countries. Unfortunately, iron deficiency anemia is not anticipated and recognized in most of the cases seen in Iran and other parts of the world as well. (1, 2, 3,).

Records of 365 infants and children with a variety of ailments who were admitted to the Pediatric Department of Tehran University Pahlavi Hospital from March 1963 - March 1964 were reviewed. These infants and children were from low socio-economic groups. They each had at least one or more blood counts and hemoglobin determination during their hospital stay. 262 out of 365 cases, or 71% showed a low hemoglobin level, below 10½ gms per 100 mls and evidence of hypochromic microcytic anemia. Our findings are summarized in the following table.

Age in years	Number of Patients	Percent	Hg. gm, per 100 mls. Mean S. D.
½–2	123	46.9	9.9±0.5
2–5	59	22.5	8.6±1
5–13	80	30.5	8.8±0.9

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In the ½—2 year age group consisting of 123 patients, or 46.9% of our cases. the hemoglobin level was 9.9±0.5 gm per 100 milliliters.

In the 2—5 year age group, of 59 patients, or 22.5% of our cases, the hemoglobin level was 8.6±1 gm per 100 millileters. There were 80 patients, or 30.5 % of our cases, in the 5—13 year age group; and the hemoglobin level was 8.9±0.9 gm per 100 milliliters.

Among different manifestations seen it is worthy to call attention to two shepherd boys 12½ and 13 years old both with iron deficiency syndrome, hepatosplenomegaly, hypogonadism and dwarfism who had a geophagia habit for a long period of time. Zinc deficiency is also considered an explanation of hypogonadism and dwarfism in this syndrome. (4, 5). Two other boys of preadolescent age were also seen with painless enlargement of the parotid gland. This is a non-inflammatory hypertrophy of the parotid and is usually bilateral. Even though the precise factor involved in parotid enlargement is not known, this sign of under-nourishment has also been observed among other signs of iron deficiency anemia in India. It would appear that this is related in some way to iron deficiency, although details of possible inter-relationship between the two have yet to be established. (6).

Insufficient dietary iron ranks among the most important etiological factors of iron deficiency anemia during rapid growth. All patients in the first group, ½—2 years of age, had iron deficient diets. Actually, most of these children during their first two years not only had iron deficiency, but also suffered from multiple deficiencies or pluricarential syndrome. Milk and cereal are customarily given for a long period of time. The parents of our patients have little knowledge of preparation of suitable meals for infants of this age group, either because of lack of facilities or ignorance.

Infections due to the synergetic effect of malnutrition generally increase the deficiency state. (7). Infections may lead to anemia in various ways such as accelerated hemolysis, blood loss, suppressed erythropoiesis, or a combination of these. (8). In our experience, long and improper diets customarily prescribed by physicians for diarrheal diseases will also augment the deficiency state and anemia.

Among other causes observed, we have seen ancylostoma infestation in fifteen cases in children 5 to 13 years of age. Infestation with this parasite which causes iron deficiency anemia in older children is seen more frequently in the northern part of the country. Chronic hemorrhage may occasionally be a major factor in the production of iron deficiency anemia.

This type of anemia has in itself been cited as cause of intestinal bleeding. (9). Twelve patients, also in the above age group, had intestinal hemorrhage. The role of geophagia in producing iron deficiency anemia is not completely understood. Whether this is a cause or a result deserves further investigation.

In regard to diagnosis, attention should be given to prevalence of iron deficiency anemia in the pediatric age groups, especially the first two years of age. Hemoglobin determination and blood film studies are suggested as a routine means for diagnosis in dyspensaries, well-baby clinics, and private practices.

The most important step in prevention is the correction of faulty diets. However, it should be kept in mind that in conditions which may lead to iron deficiency anemia, it is unsafe to rely upon dietary iron alone. In clinically suspected cases and all infants with low hemoglobin levels, prophylactic iron in dosages of 10-15 mgs of elemental iron per day is advised.

In the cases presented, in addition to proper treatment of ailments for which the patients were admitted to the hospital, iron preparation were advised as soon as the general condition of these patients permitted intake of iron. In older children we have given attention to treatment of underlying causes of anemias. Even though the oral iron therapy is preferred to parenteral administration in infants and children, in order to give the required amount of iron during short hospital stays, the latter form of treatment is used in most cases.

Oral iron is prescribed in dosages of 60—75 mgs. of elemental iron per day in three divided doses up to three years of age. In older children two to three times of this amount is satisfactory. Among oral iron preparations available, we prefer ferrous-sulfate which contains 20% elemental iron. We have advised the parents to continue oral iron for two to three months and to come for evaluation of hemoglobin every month. Parenteral iron was given in two forms, Iron-Dextran and Iron sorbitol-citric-acid complex, both of which contain 50 mgs of iron per milliliter in calculated dosage. Due to lack of cooperation on the part of parents, we were unable to compare satisfactorily the results of our observation in regard to oral and parenteral iron therapy. (10, 11)

Finally, the important role of copper and cobalt in erythropoiesis should be mentioned. Copper acts as a catalyst in the formation of hemoglobin. Even though copper deficiency is apparently rare, four cases of this

deficiency have been reported recently. (12). These infants were recovering from marasmus and were on exclusive milk diets resulting in probable loss and malabsorption as well as poor intake during an accelerated growth period. Cobalt exercises its erythropoietic effect only when adequate iron is available. The main indications for cobalt therapy are certain anemias, especially those which are resistant to treatment such as anemia with infections including tuberculosis and renal diseases. We have not used either copper or cobalt in treatment of our patients.

Summary

The object of this paper is to draw attention to iron deficiency anemia which is the most common nutritional disturbance in infants and children. Iron deficiency anemia constitutes the most prevalent form of anemia in this age group.

The records of infants and children admitted to the Pediatric Department of Tehran University Pahlavi Hospital for various ailments during a one year period (March 1963 - 1964) were analyzed. 262 infants and children out of a total number of 365, or 71•/•, showed iron deficiency anemia detected by blood film studies and hemoglobin determination. The majority, 123 or 46.9•/•, of these patients were infants and children between six months and two years of age.

The etiology indicates that faulty feeding is the main cause. Infections, parasites, and hemorrhage were among other causes observed.

With regard to treatment, parenteral iron was preferred because of its effectiveness in short periods of hospital stay.

In conclusion, the routine study of blood films and hemoglobin determination, especially in the low socio - economic group of medically less organized countries, is advised.

Résumé

Le but de cet article est d'attirer l'attention sur l'anémie ferriprive qui est un trouble de la nutrition le plus fréquemment rencontré chez le nourrisson et l'enfant.

L'anémie par carence en fer constitue la forme la plus dominante des anémies rencontrées dans ces groupes d'âge.

L'analyse des dossiers des nourrissons et des enfants qui ont été admis pour diverses raisons, depuis Mars 1963 à Mars 1964, au département pediatrique de l'hopital Pahlavi de l'université de Teheran, a demontré que sur un total de 365 sujets un nombre de 262 cas, soit 71•/• ont presenté une carence en fer depistee par examen du frottis de sang et par la détermination du taux de l hemoglobine. 123 nourrissons et enfants, âgés de 6 mois à 2 ans constituait la majorité de ces patients, soit 46.9•/• de tous les cas.

Au point de vue étiologique un régime faux de la nutrition se situe au premier plan, ensuite viennent, les infections, les parasites et les hémorragies.

Le fer administré par voie parenterale a été preferé comme traitement de choix à cause de son efficacité rapide pendant la courte période de l'hospitalisation des malades.

En conclusion un examen de routine du frottis de sang et la détermination du taux de l'hemoglobine est recommandé, surtout chez les malades des classes inferieures au point de vue socio - économique, des pays en voie de développement médical .

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