

Iron-deficiency anemia in children 0-6 years in Vlora

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Abstract

Aim: This observational study examined the causes of anemia, the level of severity, and improvement in blood analysis results in children 0-6 years of age, following treatment with supplemental iron, with intent to identify patterns of significance.

Methods: This study involved 85 children who were hospitalized at the Pediatric ward in the Regional Hospital of Vlora, and who had been tested at the hospital laboratory during the period June-November, 2014.

Results: 55 out of 85 children examined resulted with no problems or with a mild level of anemia. Conversely, 30 out of 85 children examined had evident problems associated with anemia.

Conclusion: Anemia, especially in its iron deficiency form, is frequent in the Albanian daily practice, most notably among children under artificial nutrition, or who were born either prematurely or underweight.

Keywords: anemia, breastfeed, child, infant, iron deficiency.

Introduction

In comparison with other pathologies, anemia in general, but especially in the iron deficiency form, is most common during the pediatric ages, particularly in the first year of life (1-4).

Newborns have a typical iron level of 250-300 mg/dl, most of which is considered hemoglobin iron, whereas the remainder is deposited in organ tissues and reticular cells (3-9).

In iron-deficiency anemia, deposited reserves fall, and less iron is transported, resulting in reduced circulation of hemoglobin, and reduced oxygen to the heart, brain and muscles.

According to the World Health Organization (WHO) criteria, anemia occurs under the following circumstances (1,4,10):

- for children 6 months to 2 years of age: level of Hb is <11g/dl and Hct is <32.9%;
- for children 2-5 years of age: level of Hb is <11.2 g/dl and Hct is <33.6%.

During the first year after birth, children should receive a daily minimum of 150 mg of supplemental iron following a normal birth, and a minimum of 200 mg daily for those born underweight or premature, since it is known that iron deposits are accumulated during the final months of intrauterine development (2,5,8).

Very small quantities of iron are eliminated through feces, urine or loss through the skin.

Iron is absorbed through the intestinal tract. During the first 6 months after birth, the amount of iron taken in natural ways by children is small. This amount is typically inadequate if the child is not breastfed (the most natural method for all mammal infants), but instead receives artificial food at a time when nourishment should be rich in iron. Thus, anemia manifests when reserves of iron at birth are low - often encountered in (3,7,9):

- underweight and premature babies;
- twins or other multiple pregnancies;
- in cases where the mother during the pregnancy suffered from accentuated iron-deficiency anemia.

Anemia may result from bleeding sustained during the act of birth itself, such as from the placenta or improper procedures of intervention during birth. Primary signs of anemia include paleness of skin, yellowing of mucus membranes, anorexia, troubled sleep, apathy, slight loss of weight, and sub-febrile fevers (1,6,8).

This study examines the causes of anemia, levels of severity, and improvement in blood tests results in children 0-6 years of age, following treatment with supplemental iron. The ultimate goal is to promote breastfeeding as the preferred method of infant's nutrition.

Methods

This study included 85 children (30 males and 55 females) treated at the Pediatric ward of the Regional Hospital in Vlora during the period June-November, 2014.

All children were measured HGB, HCT, MCV, ferritin level, Serum Iron (SI). In addition, structured interviews were conducted with families of the affected children in order to obtain information related to mothers' health status at the time of conception and during the pregnancy, as well as birth and postnatal conditions of the children.

The categories of anemia were classified as follows:

- mild to moderate, in cases where the Hgb values were 90-120 g/l for males, and 80-110 g/l for females,
- severe anemia, when Hgb levels were below 70 g for males, and 80 g for females.

Laboratory blood testing was conducted using a Micros 60 Cell Counter and ECO Autoanalyzer.

Results and Discussion

On the whole, 55 out of 85 children examined resulted positive for iron deficiency, but showed little or no clinical signs. On the other hand, 30 out of 85 children tested were classified as cases with severe anemia.

Findings of laboratory blood testing for 30 children with severe anemia are presented in Table 1.

Table 1. Individual analytical values for 30 pediatric cases with severe anemia

No.	RBC count	Hgb	Hct	MCV	MCH	Serum Iron	Ferritin
1	2.980000	8.5	25.5	70	24.9	24	7
2	4.100000	8.9	26.7	85	30.2	29	7
3	3.350000	9.3	27.3	69	25.8	31	8
4	5.011000	10.0	30.0	59	22.4	49	8
5	2.517000	7.8	23.4	77	26.3	18	4
6	3.214000	9.0	27.0	80	29.6	29	6
7	4.255000	8.6	25.8	84	27.7	25	4
8	2.860000	9.2	27.6	66	21.5	31	6
9	3.724000	8.9	26.7	85	29.1	28	5
10	4.015000	9.3	27.9	74	26.3	32	7
11	4.106000	8.4	25.2	61	24.2	21	5
12	2.937000	7.9	23.7	84	27.6	19	4
13	3.225000	9.1	27.3	63	22.8	30	8
14	4.341000	7.4	22.2	71	26.4	14	3
15	2.886000	8.8	26.4	83	30.2	27	6
16	4.019000	9.2	27.6	68	23.1	31	7
17	3.262000	7.5	22.5	60	21.5	15	4
18	4.229000	8.9	26.7	73	26.8	28	5
19	5.112000	8.0	24.0	66	23.3	19	5
20	3.116000	7.4	22.2	75	24.2	15	4
21	5.019000	9.4	28.2	72	26.1	32	7
22	4.255000	8.5	25.5	69	21.1	24	6
23	4.225000	7.1	21.3	84	29.1	11	3
24	2.996000	7.9	23.7	75	25.8	19	5
25	3.116000	9.0	27.0	81	27.4	29	7
26	4.223000	8.3	24.9	70	26.0	22	6
27	3.447000	8.6	25.8	83	29.5	25	6
28	5.133000	9.2	27.6	64	22.1	31	8
29	4.156000	9.5	28.5	72	26.0	34	7
30	3.229000	9.1	27.3	79	26.5	31	6

On the other hand, Table 2 presents norms and standards of the blood tests.

The time period was relatively short and the number of patients observed was relatively small - but it seems that (budget allowing) testing and monitoring larger groups of children will result in much more substantial findings.

Based on the results of our observations and reviews, we conclude as follows:

- Children between the ages of 0-6 years are prone to problems as a result of iron-deficiency anemia, during the growth period when their needs (for iron) are high and their nourishment, especially artificial nourishment, contains inadequate levels of iron for proper development (1-4).
- The first essential step in preventing pediatric anemia is to ensure that the pregnant or breastfeeding mother is herself properly nourished (2,3).

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