

Incidence of Iron Deficiency Anemia and associated with some Risk Factors among Children in Al-Nasiriyah City

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Abstract: Iron deficiency anemia is the most common nutritional deficiency among children. This study aimed to identify the possible risk factors of iron deficiency among children in Nasiriyah city / South of Iraq. This was a cross-sectional study in light of 100 children, 1 month to 12 years. The highest rate of anemia was in the age group (4-6 years) and the lowest rate was in the age group (10-12 years) 30%, 20% respectively. The percentage was higher in girls (60%) than in boys (40%). The rate of anemia in rural than urban was 62%, 38% respectively. Higher percentage (60 %) of children suffering from anemia were belong to the middle-income family, while 36 % of cases were belong to the low-income family. Only 4% of cases were belong to the high – income. 46% of children with anemia were nutrition by breast-feeding, while the rest 54 % were rely on being fed dry milk. 26% patients are associated with the positive family history of anemia, while 74% had no family history of anemia. High percentage of children with anemia 90% were eating chips and biscuits greatly.

Keywords: Iron deficiency; Anemia; Children; Risk factors.

1.Introduction

Anemia is a condition in which the level of hemoglobin in the blood is below normal levels for a given age, gender and physiological condition due to a deficiency of one or more essential nutrients, among them iron, folic acid, zinc, vitamin B12 and proteins [1]. Iron deficiency is the most widespread and common micronutrient deficiencies in the developing world today [2]. Approximately 90% of different types of anemia in the world are due to iron deficiency [3]. Poor quality of food and low dietary iron are the principles factors that contribute to the increased incidence of iron deficiency [4]. In developing countries, low standards of living, low socio-economic conditions, restricted access to food and lack of knowledge for good dietary practices and personal hygiene contribute even more to a high occurrence of iron deficiency and hence anemia [5,6,7]. The causes of iron deficiency may begin when some fetuses in uterus due to the emergence of symptoms of anemia in mothers in pregnant period. The problem is increased in early childhood stage because incorrect dietary habits, especially during weaning. When, in many cases, is replaced by the mother's milk of food that It is poor in iron [8]. Mothers' nutrient deficiency during lactation period may reduce the concentration of some of these nutrients in breast milk with the consequent drain In the child. In addition to this, the absorption of iron from breast milk reduces up to 80% when other foods begin to consume [9].

Children, especially young children, are more susceptible to anemia because of the high requirement of iron during the growth period, the lower the amount of iron from food supplements, and frequent bouts of inflammation [10]. Although breastfeeding contains relatively low levels of iron, but it is easily absorbed and adequacy for infants up to six months of age [11]. Since, for a longer period of breast-feeding may further risk factors for iron deficiency [12,13] , therefore the child from six months of age and beyond are required extra iron from complementary foods [14].

Cereals, especially rice, which provides more of the total calories in the diet, contain low biologically iron and high phytate, which Interferes with iron absorption [15]. Although iron deficiency is a common cause of nutritional anemia in developing countries, lack of other nutrients such as vitamin A, C, B9, B12, D, and zinc as well as toxicity of lead may also cause to this condition [16].

Increased erythrocytes rotation may be a result of blood loss, mechanical destruction of erythrocytes, or hemolysis. Hemolysis may result from inherited defects in RBCs; therefore, sex, ethnicity, and family history are probable, risk factors. Medications may cause anemia because of immune-mediated hemolysis or oxidative stress. Mechanical destruction may occur in persons with mechanical valves. RBC loss may also be a result of acute bleeding [17].

The most common symptom of all types of anemia is fatigue (tiredness). Fatigue occurs because your body doesn't have enough red blood cells to carry oxygen to its many parts. Also, the red blood cells your body makes have less hemoglobin than normal. Hemoglobin is an iron-rich protein in red blood cells. It helps red blood cells carry oxygen from the lungs to the rest of the body. Anemia also can cause shortness of breath, dizziness, headache, coldness in your hands and feet, pale skin, chest pain, weakness, and fatigue [18,19].

Patients with severe iron-deficiency anemia that causes cardiovascular symptoms, such as heart failure or angina, should receive red-cell transfusions. This approach rapidly corrects not only hypoxia but also iron deficiency, since one unit of packed red cells provides approximately 200 mg of iron [20].

2. Methodology

2-1. Study area

This study was conducted to investigate anemia in Al-Nassiriyah city, southern of Iraq

2.2. Study Design

The present study was designed to investigate the rate of iron deficiency causing anemia in children in association with age, gender, feeding, living, family income, family history and take medication in Al-Nassiriyah city. A questionnaire was designed for this purpose. Some other research methods were used like observation, interviews from Bint Alhuda hospital. According family income of the families, the study population was divided into three categories, including Lower, Middle and Upper class.

2.3. Data Collection

The study included 100 cases of children from Bint Alhuda hospital in Al-Nassiriyah city. Data collection was performed from August to November 2023. The information was provided by the child's mother or guardian.

2.4. Data Analysis

Data collected was undergo to statistical package, SPSS version 20, including mean, standard deviation and chi-square. P.value less 0.05 mean significant differences.

3. Results

The current study showed that 26 % of cases had age from 1 month to 3 years, while 30 % of cases were in 4-6 years, as for 24 % within the age category 7-9 years. The rest of cases were in the age group 10-12 years with non-significant differences between age group P.value (0.556) (table 1).

Table 1: Iron deficiency anemia percentage with age children

Age (years)	Study group		P.value
	N	%	
1 month -3 years	26	26 %	0.556
4-6	30	30 %	
7-9	24	24 %	
10-12	20	20 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

Out of 100 case 60 (60%) were females while rest 40 (40%) were males with significant differences between study group according to gender P.value (0.046) (table 2).

Table 2: Iron deficiency anemia percentage with gender.

Gender	Study group		P.value
	N	%	
Male	40	40 %	0.046*
Female	60	60 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

Majority of cases 62 % were from rural areas, while 38 % were from urban area with significant differences between study group according to living P.value (0.016) (Table 3).

Table 3: Iron deficiency anemia percentage with living area.

Living	Study group		P.value
	N	%	
Urban	38	38 %	0.016*
Rural	62	62 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

The majority of children suffering from anemia 60 % were belong to the middle-income family, while 36 % of cases were belong to the low-income family. Only 4% of cases were belong to the high – income with highly significant differences between study group according to family income P.value (0.000) (Table 4).

Table 4: Iron deficiency anemia percentage with family income.

Family income	Study group		P.value
	N	%	
Low	36	36 %	0.000**
Medium	60	60 %	
High	4	4 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

46% of children with anemia were nutrition by breast-feeding, while the rest 54 % were rely on being fed dry milk with non-significant differences between study group according to feeding P.value (0.424) (Table 5).

Table 5: Iron deficiency anemia percentage with feeding.

Feeding	Study group		P.value
	N	%	
Breast feeding	46	46 %	0.424
Dry milk	54	54 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

26% patients are associated with the positive family history of anemia, while 74% had no family history of anemia with highly significant differences between study group according to family history P.value (0.000) (table 6).

Table 6: Iron deficiency anemia percentage with family history.

Family history	Study group		P.value
	N	%	
Yes	26	26 %	0.000**
No	74	74 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

The current study found a high percentage of children with anemia 90% were eating chips and biscuits greatly with highly significant differences between study group according to eating chips or biscuits P.value (0.000) (table 7).

Table-7 Iron deficiency anemia percentage with eating chips & biscuits.

Eating Chips or Biscuits	Study group		P.value
	N	%	
Yes	90	90 %	0.000**
No	10	10 %	
Total	100	100 %	

P.value $\leq$ 0.05 Significant

4. Discussion

The current study included 100 children with ages from 01 - 12 years and included both sexes (Male and Female). Anemia is one of the common health problems among children in developing countries. Iron deficiency anemia is the most common type in children. The present study estimated iron deficiency anemia in Thi Qar province.

Our findings showed that the prevalence of iron deficiency anemia is higher in age group 4 – 6 years (30%) and lower in age group 10 – 12 years (20%), while the percentage of anemia in the age group 1 month to 3 years and 7 – 9 years was 26% and 24% respectively. The results of Odeh (21) showed 32.4%, 35.3%, 25.9% and 12.1% of iron deficiency anemia in age groups 6 – 8 years, 9 – 11 years, 12 -14 years and 15 and more respectively. The cause of iron deficiency anemia in children due to eating foods that lack of iron such as chips and biscuits.

This study showed that the rate of anemia among girls (60%) was higher than among boys (40%). These results agreed with Odeh [21] as their study showed that the girls had iron deficiency

30.5%, which is higher than that found among boys (21.6%). Women generally have a smaller volume of blood; therefore, they can suffer from anemia more than a man.

According to living area, there was difference between the rate of iron deficiency in children living in rural areas (62%) compared to children in urban areas (38%). This result agreed with Zhonghua [22] who proposed that the rate of iron deficiency in rural children was higher than urban children. The reason for this difference may be due to the rural children drinking of cow's milk because of the drinking of liquid cow's milk causes hemoglobin full down in the first year of life [23].

Based on economic condition, the present study showed that the prevalence of anemia was high (60%) in the children of middle family income. Unlike, the rate of anemia in children of high family income and low family income was 4% and 36% respectively. The study by Ullah et al. [24] suggested that the prevalence of anemia was (55.8%) in the children of low family income, while 32.2% anemic children belong to middle family income and 17% belong to high family income. These results may be due to lack of nutrient [25].

Iron deficiency among breastfeeding children was lower (46%) than children whom drinking dry milk at the first year of age (54%). Some feeding habits have been confirm as having a significant impact on the evolution of anemia. These include short duration of exclusive breastfeeding and consumption of cow milk [26].

Hemoglobin level was lower among children whose family history for mother anemic. This could be due to genetic disorder.

In the current study, 90% of children with anemia notified that they prefer to eat chips. As known the chips is poor source of iron and may be effect of children's appetite for other foods.

5. Conclusion

Iron deficiency anemia in children can be associated with several risk factors, the most important of which are gender, residence, family income, family history, and unhealthy nutrition.

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