

## Original article

# Prevalence of iron deficiency anemia among children

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## Abstract

**Background:** The present study was conducted for assessing prevalence of iron deficiency anemia among children of known population.

**Materials & methods:** A total of 200 subjects were analyzed. All the subjects belonged to the age group of 8 to 15 years. All the subjects were recalled in the morning and blood samples were obtained. Blood haemoglobin levels were analyzed. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

**Results:** A total of 200 subjects were analyzed. Mean age of the subjects was 12.5 years. Out of 200 subjects, iron deficiency anemia was found to be present in 88 subjects. Hence; the overall incidence of iron deficiency anemia was 44 percent. Among these 88 subjects, 50 were girls while the remaining were boys.

**Conclusion:** Girls are more affected by iron deficiency anemia in comparison to boys.

**Key words:** Iron deficiency anemia, Children

## Introduction

Anaemia is typically the first clue to iron deficiency, but an isolated haemoglobin measurement has both low specificity and low sensitivity. The latter can be improved by including measures of iron-deficient erythropoiesis such as the transferrin iron saturation, mean corpuscular haemoglobin concentration, erythrocyte zinc protoporphyrin, percentage of hypochromic erythrocytes or reticulocyte haemoglobin concentration. However, the changes in these measurements with iron deficiency are indistinguishable from those seen in patients with the anaemia of chronic disease. The optimal diagnostic approach is to measure the serum ferritin as an index of iron stores and the serum transferrin receptor as a index of tissue iron deficiency.<sup>1-3</sup>

Once the diagnosis of iron deficiency anemia is made, the physician must identify the cause and devise a treatment plan. Iron deficiency anemia results from a variety of causes that fall in to four

general categories related to the intake or loss of iron. In the vast majority of cases, the cause of iron deficiency anemia results in an anemia that is both avoidable and reversible by increasing iron supplementation or reducing iron loss. However, the fact that over three million females in this country continue to manifest iron deficiency anemia suggests that generic therapeutic approaches remain suboptimal. It may be necessary to rethink general treatment approaches in order to reduce the incidence of iron deficiency anemia.<sup>4- 6</sup> Hence; the present study was conducted for assessing prevalence of iron deficiency anemia among children of known population.

### **Materials & methods**

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### **Results**

A total of 200 subjects were analyzed. Mean age of the subjects was 12.5 years. Out of 200 subjects, iron deficiency anemia was found to be present in 88 subjects. Hence; the overall incidence of iron deficiency anemia was 44 percent. Among these 88 subjects, 50 were girls while the remaining were boys.

Table 1: Iron deficiency anemia

Iron deficiency anemia	Number	Percentage
Present	88	44
Absent	112	56
Total	200	100

### **Discussion**

Iron deficiency anemia is the principal nutritional dearth in the world, and it especially affects children and pregnant women in developing countries. Iron deficiency is defined as a reduction in total body iron to an extent that iron stores are fully exhausted and some degree of tissue iron deficiency is present. In epidemiological studies, it has been common practice to determine the prevalence of both mild iron deficiency without anaemia and more advanced iron-deficiency

anaemia (IDA). An important term that is not synonymous with iron deficiency is iron-deficient erythropoiesis (IDE). This refers to laboratory evidence of an impaired supply of plasma iron to the erythroid marrow for haemoglobin synthesis, either directly as a reduced iron saturation of plasma transferrin, or indirectly as signs of iron deficiency in circulating red blood cells.<sup>6-9</sup>

A total of 200 subjects were analyzed. Mean age of the subjects was 12.5 years. Out of 200 subjects, iron deficiency anemia was found to be present in 88 subjects. Hence; the overall incidence of iron deficiency anemia was 44 percent. Among these 88 subjects, 50 were girls while the remaining were boys. Schneider JM et al determined the prevalence of anemia, low iron stores, ID, and IDA in children participating in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) population, and to assess the value of using hemoglobin to predict ID. The prevalence of anemia was 11.1% (hemoglobin <110 g/L at 12-24 mo or <111 g/L at 24-36 mo). Study- and literature-determined abnormal values for iron measures were as follows: serum ferritin  $\leq 8.7$  or  $\leq 10.0$  microg/L, serum transferrin receptor  $\geq 8.4$  or  $\geq 10.0$  microg/mL, and transferrin saturation  $\leq 13.2\%$  or  $\leq 10.0\%$ , respectively. The prevalences of low iron stores (low ferritin) were 24.8% and 29.0%, of ID ( $\geq 2$  abnormal iron measures) were 16.2% and 8.8%, and of IDA (ID with low hemoglobin) were 3.4% and 3.2% on the basis of study- and literature-determined cutoffs, respectively. Hemoglobin concentration was used to predict study- and literature-determined ID on the basis of receiver operating characteristic curves. The sensitivity of low hemoglobin in predicting study- and literature-determined ID was low (23.2% and 40.0%, respectively). Anemia and ID were prevalent in this WIC sample, but IDA was uncommon. Low hemoglobin is a poor predictor of ID.<sup>9</sup>

In Canada and the United States, approximately 5% of children from one to five years of age suffer from ID and anemia compared with 40% to 50% of children in nonindustrialized countries (6). Although the prevalence of IDA in Canadian children among the general population is low (3.5% to 10.5%), there are certain remote populations where the prevalence is higher. Previous studies have shown the prevalence of IDA to be very high in Canadian Aboriginal populations, varying from 14% to 50%. In a recent study completed in two northern Ontario First Nations communities and one Inuit community, the prevalence of anemia (hemoglobin less than 110 g/L) was found to be 36.0%; ID (soluble transferrin receptor greater than 8.5 mg/L) was present in 27.6% of the study population; and approximately 53.3% had depleted iron stores (serum ferritin less than 12  $\mu\text{g/L}$ ). As in the developing world, prevention and treatment strategies in these

vulnerable populations are vital to prevent the significant adverse effects of IDA in Canadian children.<sup>11-13</sup>

## Conclusion

Girls are more affected by iron deficiency anemia in comparison to boys.

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