

Original article:

Evaluation of Iron Deficiency Anaemia Among School Going Children in Uttar Pradesh Population

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ABSTRACT

Background: Anemia is still one of India's major public health problems, despite more than 37 years of iron and folic acid supplementation by the Government of India through the National Nutritional Anaemia Prophylaxis Programme (NNAP). The present study was conducted for assessing the presence of iron deficiency anaemia among school going children and their gender correlation.

Materials & Methods: A total of 500 school going children within the age group of 8 years to 15 years were enrolled. Complete demographic and clinical details of all the subjects were obtained. General clinical examination of all the subjects was done. Sahli's Method was used for evaluation of haemoglobin levels. The criteria of anaemia were accepted as the haemoglobin value below 12g/dl for girls and 13g/dl for boys. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results: Among them, 250 were males while the remaining were females. Overall, anaemia was found to be present in 138 subjects. Hence, the overall prevalence of iron deficiency anaemia was 27.6 percent. Out of 138 subjects with iron deficiency anaemia, 33.33 percent were males while the remaining 66.67 percent were females.

Conclusion: Enhancement of the economic status of families, especially poor families, is a prerequisite to the amelioration of anemia among adolescent girls.

Key words: Anaemia, School, Children.

INTRODUCTION

Anemia is still one of India's major public health problems, despite more than 37 years of iron and folic acid supplementation by the Government of India through the National Nutritional Anaemia Prophylaxis Programme (NNAP) launched in 1970. This program was started specifically for pregnant women. However, data on the prevalence of anemia during 1985 and 1986 were very discouraging. Some modifications of NNAP have been done to make it more effective and efficient, but the basic problem still remains. This may be due to the fact that supplementation during pregnancy may be too late for desirable birth outcomes.¹⁻³ A large number of women are already anemic to a great extent when they enter into pregnancy. Therefore, iron and folic acid supplementation should be started prior to pregnancy or even earlier. In India, pregnancy generally occurs after

marriage and the mean age of women at marriage is 18.3 years, which is in the adolescent (10 to 19 years) period. Thus, it is essential to improve iron status in the adolescent period before childbearing, especially in developing countries such as India.⁴⁻⁶

Anemia is usually classified based on the size of RBCs, as measured by the mean corpuscular volume (MCV). Anemia can be microcytic (MCV typically less than 80 μm^3 [80 fL]), normocytic (80 to 100 μm^3 [80 to 100 fL]), or macrocytic (greater than 100 μm^3 [100 fL]). The RBC distribution width is a measure of the size variance of RBCs. A low RBC distribution width suggests uniform cell size, whereas an elevated width (greater than 14 percent) indicates RBCs of multiple sizes.⁵⁻⁷ Hence; the present study was conducted for assessing the presence of iron deficiency anaemia among school going children and their gender correlation.

MATERIALS & METHODS

The present study was conducted for assessing the presence of iron deficiency anaemia among school going children and their gender correlation. A total of 500 school going children within the age group of 8 years to 15 years were enrolled. Complete demographic and clinical details of all the subjects were obtained. General clinical examination of all the subjects was done. Sahli's Method was used for evaluation of haemoglobin levels. The criteria of anaemia were accepted as the haemoglobin value below 12g/dl for girls and 13g/dl for boys. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Chi-square test was used for evaluation of level of significance.

RESULTS

A total of 500 school going children were analysed. Among them, 250 were males while the remaining were females. Overall, anaemia was found to be present in 138 subjects. Hence, the overall prevalence of iron deficiency anaemia was 27.6 percent. Out of 138 subjects with iron deficiency anaemia, 33.33 percent were males while the remaining 66.67 percent were females.

Table 1: Prevalence of iron deficiency anaemia

Anaemia	Number	Percentage
Present	138	27.6
Absent	362	71.4
Total	500	100

Table 2: Correlation of iron deficiency anaemia among school going children with their gender

Anaemia	Number	Percentage	p- value
Males	46	33.33	0.001 (Significant)
Females	92	66.67	
Total	138	100	

DISCUSSION

An estimated 20 percent of American children will have anemia at some point in their childhood. Anemia is defined as a hemoglobin (Hgb) concentration or red blood cell (RBC) mass less than the 5th percentile for age. Hgb levels vary by age, and many laboratories use adult norms as references; therefore, the patient's Hgb level must be compared with age-based norms to diagnose anemia.⁶⁻⁸ Hence; the present study was conducted for assessing the presence of iron deficiency anaemia among school going children and their gender correlation.

A total of 500 school going children were analysed. Among them, 250 were males while the remaining were females. Overall, anaemia was found to be present in 138 subjects. Hence, the overall prevalence of iron deficiency anaemia was 27.6 percent.

Bharti P et al investigated the severity and distribution of anemia among Indian adolescent girls aged 10 to 19 years and its association with socioeconomic and sociodemographic factors. The study used data from the District Level Household Survey, round II, 2002–04, conducted under the Reproductive and Child Health Project. Data were collected on hemoglobin along with socioeconomic and sociodemographic factors of the households. The survey covered rural and urban areas of 35 states or union territories. Data from 177,670 adolescent girls were analyzed. The highest prevalence of anemia (99.9%) was observed in Jharkhand in eastern India. The prevalence in the northeastern states was relatively low. The highest prevalence rates were observed among older girls (15 to 19 years), illiterate girls living in rural areas, girls in illiterate households, girls from households with a low standard of living, non-Christian girls, girls from Scheduled Tribes, girls living in west India, and married girls. The highest percentages of girls with normal hemoglobin were reported among Christian Scheduled Tribes (39.4%) and among girls in northeastern India (40.1%). Analysis by binary ordered logistic regression showed that anemia status did not depend on urban or rural residence or on age.⁹

Out of 138 subjects with iron deficiency anaemia, 33.33 percent were males while the remaining 66.67 percent were females. Basu S et al assessed the prevalence of anemia and determine serum ferritin status among 1120 apparently healthy adolescents (12 to 18 years) sampled from 11 city and 2 rural schools in Chandigarh. All the boys and the girls were subjected to anthropometric examination and hemoglobin estimation. The estimation of hemoglobin was done by cyanmethemoglobin method. Serum ferritin was estimated by ELISA (UBI Magiwell enzyme immuno assay) method in 183 students. The overall prevalence of anemia calculated as per WHO Guidelines was significantly higher among girls (23.9%) as compared to boys (odds ratio--3.75, 95% CI--2.59 to 5.43, $P < 0.01$). Anemia was observed more in rural (25.4%) as compared to urban (14.2%) adolescents (OR--0.49, 95% CI--0.34 to 0.70, $P < 0.01$). Iron stores estimated by serum ferritin in 183 subjects were deficient in 81.7% and 41.6% of the adolescent girls and boys, respectively.¹⁰

CONCLUSION

Enhancement of the economic status of families, especially poor families, is a prerequisite to the amelioration of anemia among adolescent girls.

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