

# Assessment of Anemia in Paediatric Population- A Clinical Study

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## ABSTRACT

**Background:** Anemia affects more than one billion people worldwide. The present study was conducted to assess prevalence of anemia in known population. **Methods:** The present study was conducted on 128 children of age ranged 0-6 years of age of both genders. Venous blood sample was collected in all children under strict aseptic precautions in EDTA anticoagulant for hematological investigations. Hemoglobin (Hb) estimation was done using cyanmethemoglobin method. **Results:** Out of 128 subjects, there were 12 boys and 8 girls of 1 year old, 18 boys and 7 girls were 2 years old, 6 boys and 5 girls were 3 years old, 14 boys and 15 girls were 4 years old and 20 boys and 23 girls were 5 years old. There were 34 boys and 24 girls with normal grading. Mild anemia was present in 14 boys and 16 girls, moderate in 7 boys and 8 girls and severe in 15 boys and 10 girls. The difference was significant ( $P < 0.05$ ). The prevalence of anemia was 51.4% in boys and 58.6% in girls. **Conclusion:** Authors found that anemia is common among school children. The prevalence of anemia was more in girls as compared to boys.

**Keywords:** Anemia, Children, School.

## INTRODUCTION

Anemia affects more than one billion people worldwide, with pregnant women and children under five years of age comprising the vast majority of those afflicted. The development of anemia is multifactorial and could stem from a variety of factors. Nutritional deficiencies especially iron, but also folate, vitamin B12, vitamin A, and protein appear to be the biggest factor.<sup>[1]</sup>

According to the estimates of international organizations, about 1.62 billion people in the world suffer from anemia, which constitutes a global public health problem in both developing and industrialized countries.<sup>[2]</sup> However, the prevalence of anemia is higher in developing areas where pregnant women, women of childbearing age, and young children are especially vulnerable. Anemia has a multifactorial etiology and multiple factors frequently act simultaneously; in this regard, sociodemographic conditions have been strongly associated with the prevalence of anemia, especially in low income countries.<sup>[3]</sup>

Young children, 6-59 months of age, have the highest rates of anemia. The total weighted average prevalence of anemia in young children is 44.5% in the 25 countries with nationally representative

data.<sup>[4]</sup> If this weighted average prevalence is applied to the total number of children of this age in the region (including to those in countries with no representative data), the total estimated number of anemic children would be about 22.5 million.<sup>[5]</sup> The present study was conducted to assess prevalence of anemia in pre- school children.

## MATERIALS AND METHODS

The present study was conducted in the department of Pediatrics. It comprised of 128 children of age ranged 0-6 years of age of both genders. The study was approved from the institutional ethical committee. Informed consent was obtained prior to the study.

General information such as name, age, gender etc. was recorded. Complete physical examination was done for all children. Venous blood sample was collected in all children under strict aseptic precautions in EDTA anticoagulant for hematological investigations. Hemoglobin (Hb) estimation was done using cyanmethemoglobin method.

According to latest WHO guidelines anemia was taken HB < 11.5gm/dl, mild anemia HB 11 – 11.4gm/dl, moderate 8 – 10.9gm/ dl and severe HB < 8gm/dl. Results were subjected to statistical analysis. P value less than 0.05 was considered significant.

## RESULTS

[Table 1, Figure 1] shows that out of 128 subjects, there were 12 boys and 8 girls of 1 year old, 18 boys and 7 girls were 2 years old, 6 boys and 5 girls were 3 years old, 14 boys and 15 girls were 4

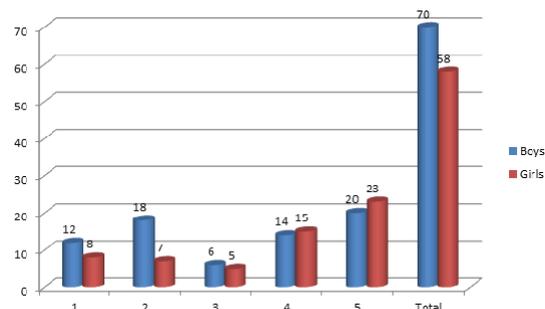
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years old and 20 boys and 23 girls were 5 years old.

**Table 1:** Age wise distribution of subjects

Age (Years)	Boys	Girls
1	12	8
2	18	7
3	6	5
4	14	15
5	20	23
Total	70	58

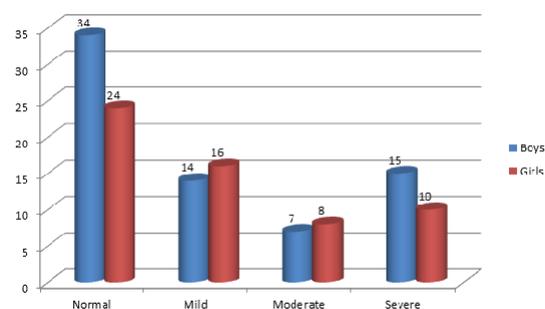


**Figure 1:** Age wise distribution of subjects

**Table 2:** Prevalence of anemia according to grading

Grading	Boys	Girls	P value
Normal	34	24	0.05
Mild	14	16	0.92
Moderate	7	8	0.91
Severe	15	10	0.05

[Table 2, Figure 2] shows that there were 34 boys and 24 girls with normal grading. Mild anemia was present in 14 boys and 16 girls, moderate in 7 boys and 8 girls and severe in 15 boys and 10 girls. The difference was significant ( $P < 0.05$ ).



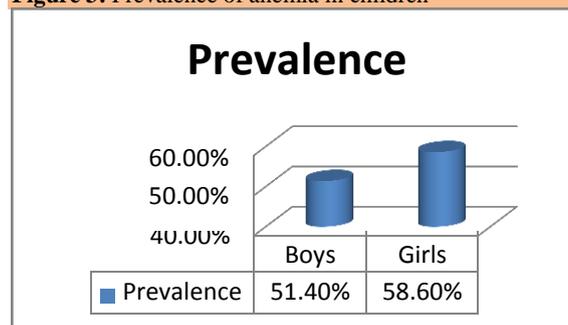
**Figure 2:** Prevalence of anemia according to grading

**Table 3:** Prevalence of anemia in children

Grading	Boys	Girls
Mild	14	16
Moderate	7	8
Severe	15	10
Total	36 (51.4%)	34 (58.6%)

[Table 3, Figure 3] shows that anemia was present in 51.4% boys and 58.6% girls.

**Figure 3:** Prevalence of anemia in children



## DISCUSSION

Anemia is the most common hematological disease of the pediatric age group. Highest prevalence of anemia is seen in developing countries.<sup>[6]</sup> Anemia is widely prevalent in India and affects both sexes and all age groups. Global anemia prevalence when examined for each physiological group using the WHO global data on anemia reports that most affected groups are pregnant women (69%) and school age children (33%).<sup>[7]</sup>

WHO global data show, that anemia due to iron deficiency affects approximately 30% of World's population and about 37% of school children. In Indian children, high prevalence of anemia varying from 27% to 90% has been reported in different studies.<sup>[8]</sup> The present study was conducted to assess prevalence of anemia in pre- school children. In this study, there were 128 school children. Boys were 70 and girls were 58. We found that out of 128 subjects, there were 12 boys and 8 girls of 1 year old, 18 boys and 7 girls were 2 years old, 6 boys and 5 girls were 3 years old, 14 boys and 15 girls were 4 years old and 20 boys and 23 girls were 5 years old.

Verma et al,<sup>[9]</sup> found that a sample population of 635 children was included. The majority of children was females (54.7%), at least 3.5 years old (60.6%), and attended preschool in the parish of Saint George (58.7%). The prevalence of anemia was 19.3%. 22% of anemic children had a mean corpuscular volume below 75 fL, and 78% of anemic children had a mean corpuscular volume between 76 fL and 99 fL.

We found that there were 34 boys and 24 girls with normal grading. Mild anemia was present in 14 boys and 16 girls, moderate in 7 boys and 8 girls and severe in 15 boys and 10 girls. 10. Montresor et al<sup>[10]</sup> in 280 children found that prevalence of anemia was more among females and children with low socio economic status. They concluded that anemia is still a major health problem. Childhood anemia still continues to be a significant public health problem in school children between 6-12 years.

Iron deficiency anemia is the most common type of anemia worldwide, and results from a decrease in

iron. The decrease in iron could be caused by a plethora of factors but in children the most common cause is most likely due to malnutrition. Alpha thalassemia occurs due to a defect in the alpha globin gene causing a decrease in alpha globin synthesis. This type of thalassemia is most common in Asian and African populations.<sup>[11]</sup> There are four alpha globin genes and therefore three types of alpha thalassemia. Four gene deletion which occurs when no alpha globin is produced, and causes hydrops fetalis. This type of alpha thalassemia is incompatible with life. Three gene deletion which results in the overproduction of beta globin produced, this type is called HbH disease and one to two genes deleted which doesn't have a clinical significance.<sup>[12]</sup> We found that prevalence of anemia is significantly higher in girls when compared to boys. This may be due to customs and believes in the families to provide nutritious food to boys than girls.

## CONCLUSION

Authors found that anemia is common among school children. The prevalence of anemia was more in girls as compared to boys.

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