

# Prevalence and Associated Factors of Anemia among under Five Years Old Children Who Attended Spinghar Momand Curative and Teaching Hospital, Jalalabad City

Hamidullah Saqib

## ABSTRACT

**Introduction:** When the amount of hemoglobin in the blood is less than two SD (standard deviation) for a specific age and sex, or when the amount of red cells in the peripheral blood is below the normal level, it is called anemia. Blood deficiency is a common global health problem in children.

**Materials and Methods:** This research has been conducted in a descriptive manner in which 200 patients referred to Spinghar Momand Curative and Teaching Hospital from 2022 to 2023 were the target population. Their blood deficiency was taken into consideration on the basis of age, sex and the severity of the disease.

**Results:** The results showed that the overall incidences of anemia were 108 (54%). The cases were 75 (69.4%) in males and 33 (30.5%) in females. Based on location, the cases of anemia were 99 (91.6%) in Nangarhar Province, 8 (7.4%) in Laghman Province and 1 (0.92%) in children from Kunar Province. Based on the severity of disease and age, 45 (41.6%) children less than five-year-old had mild anemia, 59 (54.6%) had moderate anemia, and 4 (3.7%) had severe anemia. The result of laboratory tests showed that in anemia, mean corpuscular volume (MCV), hemoglobin (HB) and hematocrit test (Hct) have changed significantly, but RDW (Red Cell Distribution Width) has not changed much.

**Discussion:** We can summarize that the cases of anemia in children vary based on age, sex and severity of the disease. Furthermore, the level of MCV, HB and HCT exists below the normal range in the child suffering from anemia, while no significant change is visible in the RDW value.

**Keywords:** Anemia, Associated Factors to Anemia, Cases, Childrens.

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## INTRODUCTION

When the level of hemoglobin (HB) in blood is less than two SD for a specific age and sex, it is called anemia.<sup>1</sup> When there is concentration in HB, hematocrit, or the decrease of red cells in anemic people compared to those healthy individuals whose age, sex, and ethnicity are the same and living in the same environment, this condition is called anemia.<sup>2</sup> Whenever the level of red cells or HB falls below from the normal range in the peripheral blood, it is considered anemia.<sup>1</sup>

Anemia is considered a common health problem around the world. According to statistics of a research conducted in 2011 by World Health Organization, it showed that those children aged between 6-59 months were 42.6%. These figures were even higher in Africa at 63.3% and in South Asia at 53.8%<sup>1</sup>. According to the World Health Organization, children under 5 years should have a HB level below 110 g/L.<sup>1,3</sup> Anemia is a common global health problem affecting 1.62 billion (24.8%) people worldwide. Anemia can occur at any stage of life. However, most incidents happen in preschool (under five years old). Globally, 293.1 million (47.4%) school-age children under the age of 5 are suffering from anemia, and 67.6% of them live in Africa.<sup>4</sup>

According to Ethiopian demographic and health survey, which was conducted in 2016, 57% of children between the

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Spinghar Institute of Higher Education, Medical Faculty, Jalalabad City, Nangarhar, Afghanistan.

**Corresponding Author:** Hamidullah Saqib, Spinghar Institute of Higher Education, Medical Faculty, Jalalabad City, Nangarhar, Afghanistan., Email: hameedsaqib2021@gmail.com

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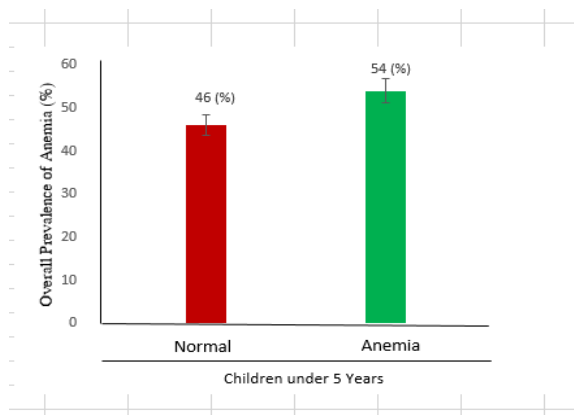
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ages of 5-59 months suffered from anemia.<sup>4</sup> The spread of anemia in China was 12.6% in children under five years old and varied geographically. It means that children living in rural areas, anemia was 13.3% in them. However, it was 10.3% in children residing in urban areas.<sup>5</sup> In 2011, the global prevalence of anemia in children under 5 years of age was 42.6%, which was equivalent to 273 million children, and it was even higher in Africa and South Asia.<sup>6</sup>

Children who suffer from anemia may be asymptomatic, non-specific symptoms that could cause anemia include: fatigue, headache, faintness, shortness of breath and irregular



**Fig 1:** Total Incidences of Anemia in Children under five-Year-old. In the course of one year, the number of cases of anemia (108) in children who came to Spinghar Momand therapeutic and teaching hospital were more than that of normal children (92).

heartbeat. Furthermore, paleness, increased heart rate, systolic flow murmur, and heart failure are present. Specific symptoms are seen in different types of anemias such as: koilonychias in iron deficiency anemia, jaundice in hemolytic anemia and bones problems in thalassemia.<sup>7</sup> This study aimed to determine the incidence and associated causes of anemia in children less than five years of age.

## MATERIAL AND METHODS

### Place and Time of the Study

This study was conducted at Spinghar Momand Curative and Teaching Hospital in the children’s ward from 1400 Hijri to 1401 Hijri.

### Research Type

This is an analytical cross-sectional study.

### Research Design

This research study included 200 children who were referred to Spinghar Momand Teaching Hospital Children’s ward having less than five years of age. Their age, sex, severity and

location were considered, and some laboratory tests were recommended for detailed information.

### CBC (Complete Blood Count)

In CBC 17 types of tests are performed through Medanic machine. To perform this test, blood is taken from the patient in two ways: from vessel and finger prick. The first is taken through capillary and the latter is taken through EDTA Tube. From the 17 types of tests we have utilized these four types as (MCV, HCT, HB, and RDW) which is clearly visible.

### Statistical Analysis

For the statistical analysis, the collection date was analyzed by SPSS software and after the categorical analysis of that data, on the basis of frequencies and percentage its interpretation was provided. Moreover, an independent sample T test has been applied to find out the P-value between some variables.

## RESULTS

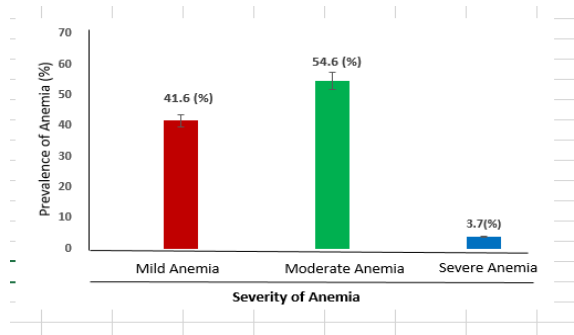
The incidences of anemia in those children who were less than five-year-old and referred to Spinghar Momand Curative Hospital in one year, it was evident after study that 108 (54%) children were suffering from anemia and 92 (46%) were normal. (Fig. 1)

### Incidences of Anemia in Children under five-year-old on the basis of severity

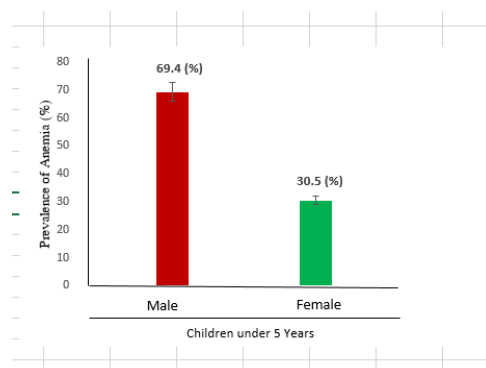
Those children who visited Spinghar Momand Curative Hospital during one year and were suffering from anemia. Based on severity their anemia was at different stages. 45 (41.6%) had mild anemia. 59 (54.6%) had moderate anemia and 4 (3.7%) had severe anemia. After the data analysis it was found that the incidences of moderate anemia were higher than mild anemia and in the second step the incidences of mild anemia were more than severe anemia. (Fig. 2)

### Incidences of Anemia in Children under Five Year Old on the Basis of Sex

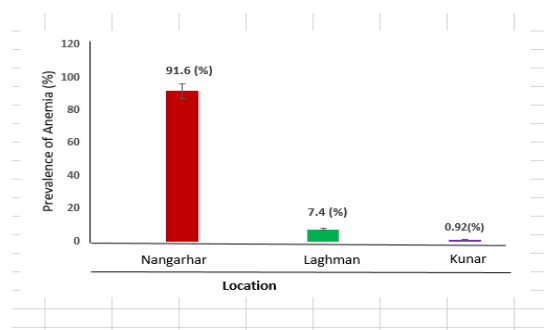
Those children who visited Spinghar Momand Curative Hospital during one year and were suffering from anemia.



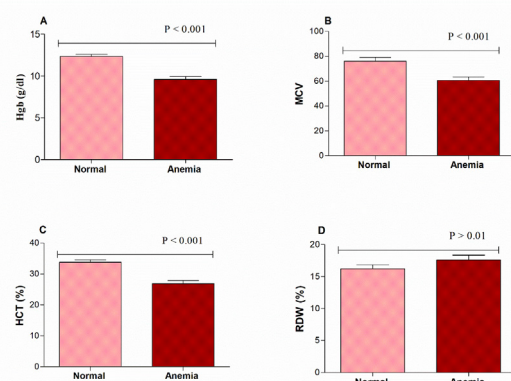
**Fig 2:** Incidences of Anemia in Children under five-year-old based on severity. After the data analysis, the incidence of moderate anemia (59) was the highest and severe anemia (4) was the least.



**Fig 3:** Incidences of Anemia in Children under Five-Year-Old Based on Sex. After the data analysis it was found that the incidences of anemia in male children were (75) and female were (33).



**Fig 4:** Incidences of Anemia Based on Location. The above graph indicates that most of the anemic patients (99) belonged to Nangarhar Province and the least (1) patients was from Kunar Province.



**Fig 5:** Effects of anemia on A: Hb (g/dl), B: MCV, C: HCT and D: RDW. The results showed that there was a significant decrease in MCV, HB and HCT, but there was no significant change in RDW.

Based on sex their anemia was analyzed as follows: Anemic cases in males were 75 (69.4%) and in females were 33 (30.5%). When the data was analyzed, it was found that the incidences of anemia based on sex, the incidences in males were higher than females. (Fig.3)

### Incidences of Anemia in Children under Five-Year-Old based on Location

The incidences based on location were as the following:

Most of the incidences 99 (91.6%) were from Nangarhar Province followed by Laghman Province (8) (7.4%) and the least number from Kunar Province as 1(0.92%). (Fig. 4)

### Effects of Anemia on Hemoglobin, MCV, HCT and RDW

All those children who visited Spinghar Momand Curative and Teaching Hospital during one year. After analyzing the data it was found out that MCV, HB and HCT had changed significantly in anemic children. However, RDW was not significantly changed compared to normal children. Anyhow, it was higher than the normal range. (Fig.5)

## DISCUSSION

The results of this study showed that the incidences of anemia in children under five years old was more in males 75 (69.4%)

than in females 33 (30.5%). Furthermore, according to the severity the incidences in children aged less than five years, moderate anemia was the highest 59 (54.6%), mild anemia was 45 (41.6%) and severe anemia was 4 (3.7%) or it was the least. A study, which Duran Canatan conducted in 2016 in Hawassa State, Ethiopia, the results were as the following: He studied 422 children under five-year-old, in them 235 (55.7%) were boys and 187 (44.3%) were girls. The results showed that the incidences of anemia were higher in boys than in girls. The mean of their age was  $27.9 \pm 16.72$  months. In this study, the overall percentage of incidences of anemia was 41.7%, of which 6.6% was mild, 19% was moderate, and 16.1% was severe.<sup>8</sup> Another study, which was conducted in India at Haryana Hospital by Dr. Raghvendra Narayan and Dr. Shivani Singh the results are presented below:

They considered a total of 109 patients, of which 47 were males and 62 were females, with a ratio of 0.75:1. From the severity point of view, the patients were divided as: 35.7% that comprised of (39) individuals had mild anemia, 47.7%, which comprised of (52) individuals had moderate anemia and 16.5%, which comprised of (18) individuals had severe anemia.<sup>9</sup> The results of our study are similar to the results of the aforementioned studies.

A study conducted at Assam City in India by Sankar and his colleagues from January 2015 to December 2016, examined 10,309 children whose ages were under 5 years, of which 5,360 (52.5%) were males and 4949 (47.5%) were females. In total 35.7% of children were suffering from anemia with an average hemoglobin of 11.36 gm/dL.<sup>10</sup> Another study that was conducted at Ahmad Abad Gujrat in India by Mr. Shital S. Panchal and his colleagues from 2015-2016, its results are given below:

They conducted a study on 300 children, of which 149 were males and 151 were females. 263 (87.7%) were suffering from anemia and only 37 (12.3%) were normal. The mean of their Hemoglobin concentration was  $9.49 \pm 1.42$  gm/dL, of which  $9.39 \pm 1.59$  gm/dL was in males and  $9.58 \pm 1.34$  gm/dL in females. It means the Hemoglobin level in children suffering from anemia was less than the normal range. In addition, the results showed that 70% of the children aged between 6 and 59 months suffered from anemia, of which 26% had mild anemia, 40% had moderate anemia and 3% had severe anemia. Moreover, in the mentioned patients, the MCV level was less than 80 fL and 100% of children suffered from Microcytic Anemia.<sup>11</sup> Our research results showed that the level of hemoglobin, MCV and HCT in anemic children decreased significantly compared to healthy children. However, there was not a big difference in RDW level between healthy and anemic children. Therefore, the results of our research are similar to the results of the above research.

A study conducted by Karim H. Rashid *et al.* at Babylon city of Iraq in 2014 its founding is given below: Overall prevalence of anemia was 58.7% in which 62.7% were males and 53.9% were females. In addition, it was also found that there was a direct relationship between Hct, Hb, and MCV.

It means are of them were decreased. On the contrary, there was an inverse relationship between Hb and RDW. It means RDW was increased.<sup>12</sup> The overall incidence of anemia in children was 54%. A study conducted by Angeson Gebreweld et al from November 2017 to February 2018 at the Gugufu Health Center in Ethiopia provides the following results: All 404 patients under 5 years of age were taken into consideration for this study. The overall incidences of anemia were 41.1%, of which 112 (76.5%) had mild anemia, 52 (31.3%) had moderate anemia and 2 (1.2%) had severe anemia. The variance between male and females was so little, it was, men were 39.6% and women were 42.3%.<sup>13</sup> A study conducted by Mauricio S. Leite and his colleagues in Brazil from 2008 to 2009 shows that 5397 children were studied, the overall percentage of anemic children was 51.2 and the amount of hemoglobin was less than 11 g/Dl. Furthermore, the result showed that the cases of anemia in males were 2762 (52.79%) and in females were 2635 (49.6%). It was comparatively more in males than females.<sup>14</sup> Another study, which was conducted by Nazneen Habib *et al.* (2020) in Kashmir, Pakistan the results were as below:

All 384 children who were under five-year-old taken into consideration. The overall incidences of anemia were 47.7 and 52.3% were non-anemic.<sup>15</sup> In conclusion, we can say that the above research results are close to our research results.

## CONCLUSION

The number of anemic children who were referred to Spinghar Momand Curative and Teaching Hospital for one year were higher in them than the normal ones. In addition, the cases of anemia were more in males than females and on the basis of the severity of the illness, the cases of mild anemia were higher. An opportunity should be provided to investigate the cases of anemia in children under 5 years of age and their correlation with amebiasis and giardiasis.

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