

Frequency of Anemia in Healthy School Age Population in Faisalabad

Kashan Arshad, Muhammad Azam, Tahir Munir, Muhammad Imran Khan, Hafiz Nasim Abbas, Muhammad Asghar Butt

ABSTRACT

Introduction: Anemia is defined as" condition in which hemoglobin (Hb) concentration or red blood (RBC) mass less than the 5th percentile for age. It is a common problem, especially among children and pregnant women with 40% frequency of anemia in the world. **Objective:** To determine the frequency of anemia in healthy school age population in Faisalabad. **Study Design:** Cross sectional study. **Duration of Study:** January 2016 to June 2016. **Setting:** Department of Pediatric Medicine Unit-1, Allied Hospital, Faisalabad. **Sample size:** The total sample size is 120 cases. **Sampling Technique:** Non probability purposive sampling. **Material and method:** A total of 120 children were enrolled in the study fulfilling the inclusion/exclusion criteria presenting to Department of Pediatrics Unit-1, Allied Hospital, Faisalabad. After obtaining an informed written consent of the parents/guardians of the children, the data was included in the study. EDTA treated tubes were used to collect the blood samples and transported on ice. Complete Blood Count examination was carried out. According to WHO guidelines, a hemoglobin (Hb) value <11.5 gm/dl was used as cut off for anemia for this age group. The data was analyzed through SPSS-19, mean and standard deviation was calculated for age and Hb levels of the children. Frequency and percentage was calculated for qualitative variable like gender and presence/absence of anemia. **Results:** In our study, out of 120 cases, 70 were between 4-10 years of age while 50 were between 11-15 years of age, mean \pm SD was calculated as 10.00 \pm 3.17 years, 61 were male while 59 were females, frequency of anemia in healthy school age population in Faisalabad was recorded in 44 children. **Conclusion:** We concluded that the prevalence of anemia among healthy School age population in Faisalabad is increasing, so every child must be screened to address this treatable issue. **Keywords:** Anemia, healthy school age population, Faisalabad.

Corresponding Author

Dr. Kashan Arshad

Senior Registrar, Pediatrics Unit-1
Allied Hospital, Faisalabad
Contact: +92 321-7695820
Email: kashan_arshad@hotmail.com

Submitted for Publication: 16-03-2017

Accepted for Publication: 22-04-2017

Article Citation: Arshad K, Azam M, Munir T, Khan MI, Abbas HN, Butt MA. Frequency of Anemia in Healthy School Age Population in Faisalabad. APMC 2017;11(2):132-135.

INTRODUCTION

Anemia is defined as" condition in which hemoglobin (Hb) concentration or red blood (RBC) mass less than the 5th percentile for age.¹ It is a common problem, especially among children and pregnant women with 40% frequency of anemia in the world. Frequency of anemia is increasing in developing countries than the developed ones.² The frequency of anemia in pre-school and school-age children is estimated to be 50% and 46%, respectively.³

Anemia occurs due to 3 basic mechanisms: (i) decreased production of red blood cells; (ii) blood loss; and (iii) increased destruction of red blood cells. The main causes are ranging from (a) nutritional deficiencies such as of iron deficiency, folic acid and vitamin B12; (b) chronic diseases like tuberculosis and human immunodeficiency virus; (c) parasitic diseases like schistosomiasis, hookworm; and (d) haemoglobinopathies, including thalassemia, sickle cell disease and glucose-6-

phosphate dehydrogenase (G6PD) deficiency. Infants, children, adolescents and pregnant women's are at a higher risk of anemia because they have increased needs of iron, folic acid and other nutrients.^{4,5}

In Pakistan, incidence of chronic infections, malaria and nutritional deficiencies are high and all of which are known to cause anemia. Anemia results in physical symptoms such as dizziness, tachycardia, easy fatigue ability and shortness of breath. It is also adversely affects the behavior, cognitive performance, and physical growth of infants, preschool and school going children. In Pakistan, the children belongs to poor socio-economic statuses are the most neglected children as far as health care is concerned. The country like Indonesia has covered 60% of its target population via folic acid and iron supplementation to prevent iron deficiency anemia. We still have not known the exact frequency of anemia in our school age population.⁶

A local study recorded 33.2% of the children to be anemic⁷ while a recent study³ recorded these findings as 40.5% in children between 6-12 years of age and 30.1% between 12-14 years of age.

The rationale of the study is that in our local population, data are still lacking to determine the exact prevalence of anemia in healthy school aged group and socio-demographic factors associated with anemia that will enable the development of local strategies to treat and prevent anemia in Pakistani children. In this study we aimed to estimate the prevalence of anemia in Pakistani healthy school aged children.

METHODOLOGY

Study Design: Cross sectional study.

Setting: Department of Pediatrics Medicine Unit-1, Allied Hospital, Faisalabad.

Duration of study: January 2016 to June 2016.

Sample size: Sample size of 120 cases calculated with 95% confidence level, 8% margin of error and taking expected percentage of anemia in school going children 33.2%.

Sampling technique: Non probability purposive sampling technique

Inclusion Criteria: All healthy school going children (according to operational definition), age between 4-15 years of either sex.

Exclusion Criteria: Children suffering from chronic illnesses like tuberculosis, congenital heart disease, malabsorption, malnutrition disorders and already taking treatment for anemia (confirmed on history and medical record).

Data Collection Procedure:

This study was performed in the department of Pediatrics Unit-1, Allied Hospital, Faisalabad. Informed written consent from parents/ guardian of 120 Children meeting the inclusion criteria were selected. EDTA treated tubes were used to collect all blood samples and transported on ice. Complete Blood Count examination was carried out by Medonic CA 620. Commercial controls were tested before each batch and results analyzed. According to WHO guidelines, a hemoglobin (Hb) value <11.5 gm/dl was used as cut off for anemia for this age group. Anemia severity is classified as follows: Mild anemia; Hb values between 9.5 gm/dl and 11.5 gm/dl, Moderate anemia; Hb values between 7.5 gm/dl and 9.5 gm/dl, and Severe anemia; Hb of less than 7.5 gm/dl. All this information was recorded on a pre-designed proforma.

Finally, the data was analyzed through SPSS version 19. Mean and standard deviation was calculated for quantitative variables like age and Hb levels of the children. Frequency and percentage

was calculated for qualitative variables i.e. gender and presence/absence of anemia in healthy school aged children. Stratification for age and gender was done to control the effect modifiers.

RESULTS

Age distribution of the children showing that 70 (58.33%) children were between 4-10 years of age while 50 (41.67%) children were between 11-15 years of age, mean \pm SD was calculated as 10.00 \pm 3.17 years (Table No. 1).

Table 1: Distribution of children according to age (n=120)

| Age(in years) | No. of patients | % |
|---------------|------------------|-------|
| 4-10 | 70 | 58.33 |
| 11-15 | 50 | 41.67 |
| Total | 120 | 100 |
| Mean \pm SD | 10.00 \pm 3.17 | |

Distribution of children according to gender showing 61 (50.83%) children were male while 59 (49.17%) children were females (Table No. 2).

Table 2: Distribution of children according to gender (n=120)

| Gender | No. of patients | % |
|--------|-----------------|-------|
| Male | 61 | 50.83 |
| Female | 59 | 49.17 |
| Total | 120 | 100 |

Frequency of anemia in healthy school age population in Faisalabad was recorded in 44 (36.67%) children while 76 (63.33%) children had no findings of anemia (Table No. 3).

Table No. 3: Frequency of anemia in healthy school age population in Faisalabad (n=120)

| Anemia | No. of patients | % |
|--------|-----------------|-------|
| Yes | 44 | 36.67 |
| No | 76 | 63.33 |
| Total | 120 | 100 |

Stratification for frequency of anemia in healthy school age population in Faisalabad with regards to age shows that out of 44 cases of anemia 29 were between 4-10 years while 15 were between 11-15 years of age, p value was calculated as 0.20 (Table No. 4).

Table 4: Stratification for frequency of anemia in healthy school age population in Faisalabad with regards to age

| Age(in years) | Anemia | | P value |
|---------------|--------|----|---------|
| | Yes | No | |
| 4-10 | 29 | 41 | 0.20 |
| 11-15 | 15 | 35 | |

Stratification for frequency of anemia in healthy school age population in Faisalabad with regards to gender shows that out of 44 cases of anemia 24 were male while 20 were females; p value was calculated as 0.53 (Table No. 5).

Table 5: Stratification for frequency of anemia in healthy school age population in Faisalabad with regards to gender

| Gender | Anemia | | P value |
|--------|--------|----|---------|
| | Yes | No | |
| Male | 24 | 37 | 0.53 |
| Female | 20 | 39 | |

DISCUSSION

In developing countries, anemia is one of the major health problems affecting more than 50% of school-age children. In Pakistan, prevalence of anemia in children has been reported in various local studies as well as in WHO reports.⁸ A child with anemia has been conclusively seen to poor cognitive performance, delay psychomotor development, decrease working capacity and impaired immunity. We planned this study in our local setup with the view that recent findings are not recorded which needs another recent study to record and compare with other studies so that the recent research based statistics may be determined to control this treatable morbidity.

In our study, out of 120 cases, 70 (58.33%) children were between 4-10 years of age while 50 (41.67%) children were between 11-15 years of age, 61 (50.83%) children were male while 59 (49.17%) children were females, frequency of anemia in healthy school age population in Faisalabad was recorded in 44 (36.67%).

The frequency of anemia in our study are agreed with the findings of other study recorded 33.2% of the children to be anemic⁷ while another study³ recorded these findings as 40.5% in children between 6-12 years of age and 30.1% between 12-14 years of age. The frequency of anemia was 27.1% in study done by Firehiwot Mesfin in Eastern Ethiopia in 2015.⁹

The frequency of anemia in this study is much lower than the frequency of anemia in other reports conducted in Tanzania (79.6%),¹⁰ in Kenya (35.3%),¹¹ and in Nigeria (82.6%).¹² The frequency of anemia is lower in this study might be due to the fact that socio-economic status of Pakistan is much better than these countries which is one of the major causes of anemia.

The frequency of anemia varies according to socio-demographic characteristics of children and their families. Children from families with low monthly income were likely to be anemic than those children from families with high monthly income. This might be due to the fact that families with low monthly income may not get enough foods rich in iron. These results also comparable with the study conducted in the Ningxia and Qinghai's.¹³

A study¹⁴ conducted at Khyber Pakhtunkhwa recorded the total prevalence of anemia in school age children are 34.0% which also supports in our study. There is a rapid growth with an increased iron requirement during first 2 year of life; therefore a chance of anemia is higher in this age. Moreover few factors such as limited access to iron containing food, lack of breast feeding, inappropriate weaning and chronic illnesses increase the chance of young children developing anemia.¹⁵

The rising trend of consuming junk foods and snacks is also responsible for so called 'healthy' but anemic children. This fad is also spreading to the lower socio-economic status as well. The increase prevalence of anemia among children on vegetarian diet in the present study further adds to the already existing evidence indicating that vegetarian diets are a poor source of iron.¹⁶⁻¹⁷

In summary, our findings support the hypothesis that frequency of anemia in healthy school aged children is rising. To reduce the burden of anemia in healthy school aged children, government officials must planned short term programs such as iron supplementation and long term programs including wheat flour fortification.

CONCLUSION

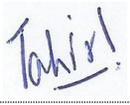
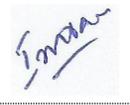
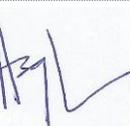
We concluded that the frequency of anemia among healthy school age population in Faisalabad is increasing, so that every child must be screened to address this treatable issue.

REFERENCES

1. Janus J, Moerschel SK. Evaluation of Anemia in Children. *Am Fam Phys.* 2010;81(12):1462-71.
2. Tahir MH, Bukhari MH, Gillani Z, Zafar SMAF. The Association of Dietary Intake and Iron Deficiency Anemia with The Socioeconomic Status in General Population of Faisalabad. *APMC* 2017;11(1):63-67.

3. Assefa S, Mossie A, Hamza L. Prevalence and severity of anemia among school children in Jimma Town, Southwest Ethiopia. BMC Hematol. 2014;14(1):3.
4. Davidsson L, Sarker SA, Jamil KA, Sultana S, Hurrell R. Regular consumption of a complementary food fortified with ascorbic acid and ferrous fumarate or ferric pyrophosphate is as useful as ferrous sulfate in maintaining hemoglobin concentrations >105 g/L in young Bangladeshi children. Am J Clin Nutr. 2009;89:1815-20.
5. Bhutta Z, Klemm R, Shahid F, Rizvi A, Rah JH, Christian P. Treatment response to iron and folic acid alone is the same as with multivitamins and/or anthelmintics in severely anemic 6- to 24-month-old children. J Nutr. 2009;139(8):1568-74.
6. Ramzan M, Ali I, Salam A. Iron Deficiency Anemia in School Children of Dera Ismail Khan, Pakistan. Pak J Nutr. 2009;8(3):259-63.
7. Habib MA, Black K, Soofi SB, Hussain I, Bhatti Z, Bhutta ZA, Raynes-Greenow C. Prevalence and Predictors of Iron Deficiency Anemia in Children under Five Years of Age in Pakistan, A Secondary Analysis of National Nutrition Survey Data 2011-2012. PLoS One. 2016;11(5):e0155051.
8. Khan MT, Akhtar T, Niazi M. Prevalence of anemia among university of Peshawar students. J Postgrad Med Inst. 2010;24(4): 265-269.
9. Firehiwot Mesfin, Yemane Berhane, and Alemayehu Worku. Anemia among Primary School Children in Eastern Ethiopia. PLoS One. 2015;10(4):e0123615.
10. Tatala SR, Kihamia CM, Kyungu LH, Svanberg U: Risk factors for anemia in schoolchildren in Tanga Region, Tanzania. Tanzan J Health Res. 2008;10(4):189-202.
11. Pullan RL, Gitonga C, Mwandawiro C, Snow RW, Brooker SJ. Estimating the relative contribution of parasitic infections and nutrition for anemia among school-aged children in Kenya: a subnational geostatistical analysis. BMJ Open. 2013;3(2):69-78.
12. Onimawo IA, Ukegbu PO, Asumugha VU, Anyaka JU, Okudu H. Assessment of anemia and iron status of school-age children (aged 7–12 years) in rural communities of Abia state, Nigeria. AJFAND. 2010;10(5):2570-85.
13. Luo R, Zhang L, Liu C, Zhao Q, Shi Y, Miller G, Elaine Y, Brian S, Alexis M, Scott R, Reynaldo M: Anemia in Rural China's Elementary Schools: Prevalence and Correlates in Ningxia and Qinghai's Poor Counties. J Health Popul Nutr. 2011;29(5):471-85.
14. Irfanullah, Zahid M, Sthanadar AA, Sthanadar IA, Ali PA. Iron Deficiency Anemia in School Age Children in District Karak Khyber Pakhtunkhwa Province, Pakistan. OJBD. 2014;2:9-15.
15. Akhtar S, Ahmed A, Ahmad A, et al. Iron status of the Pakistani population-current issues and strategies. Asia Pac J Clin Nut. 2013;22(3):340-7.
16. Christoffel K. A pediatric perspective on vegetarian nutrition. Clin Pediatr. 1981;20:632-43.
17. Dagnelie PC, Staveran WA, Vergote FJ, DingJan PG, Berg H, Hautvast JG. Increased risk of vitamin B12 and iron deficiency in infants on macrobiotic diets. Am J Clin Nutr. 1989;50:818-24.

AUTHORSHIP AND CONTRIBUTION DECLARATION

| AUTHORS | Contribution to The Paper | Signatures |
|---|--|---|
| Dr. Kashan Arshad Senior Registrar, Pediatrics Unit-1 Allied Hospital, Faisalabad | Main Author, Conception writing |  |
| Dr. Muhammad Azam Medical Officer, Pediatrics Children Hospital, Faisalabad | Give his expert view of manuscript designing |  |
| Dr. Tahir Munir Medical Officer, Pediatrics Children Hospital, Faisalabad | Drafting the article |  |
| Dr. Muhammad Imran Khan Medical Officer, Pediatrics Unit-1 Allied Hospital, Faisalabad | Data analysis & Interpretation |  |
| Dr. Hafiz Nasim Abbas Medical Officer, Pediatrics Unit-1 Allied Hospital, Faisalabad | Drafting the article |  |
| Prof. Muhammad Asghar Butt Professor of Pediatric Medicine & Dean Medicine & Allied FMU/Allied Hospital, Faisalabad | Supervised the study, Expert research opinion |  |