

Epidemiological Character of Anemia among Wasit Province Children, Iraq

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ABSTRACT

Background: Anemia is a major health problem worldwide and especially in developing countries. Anemia has adverse effects on the development of children.

Objective: The purpose of this study was to determine epidemiological character of anemia in children at age 1-5 years in AL Kharama Teaching hospital in AL KUT City. The study also sought to investigate the association between socioeconomic, demographic and cultural factors and anemia in the selected area.

Methods: A randomized, cross-sectional study was performed of children 12 to 60 months of age living in urban and rural areas of Wasit Province. Blood samples were taken from 90 randomly selected children.

Results: The results showed that 57.8 % of the children had anemia. The highest prevalence was in the younger age group.

Conclusions: The high prevalence of anemia among children in Wasit -Iraq indicates a major nutrition and health problem. This study induces the responsible persons to carry out screening test for anemia especially in low income areas.

KEYWORDS: Anemia, Pallor, Iron deficiency.

INTRODUCTION

Anemia can be defined as a reduction in hemoglobin concentration, hematocrit, or number of red blood cells per cubic millimeter. The lower limit of the normal range is set at two standard deviations below the mean for age and sex for the normal population.¹

The mean corpuscular volume (MCV) confirms the findings on the smear with reference to the red cell size, for example, microcytic (<70 fL), macrocytic (>85 fL), or normocytic (72–79 fL).¹

The investigation of anemia entails the following steps:

1. Detailed history and physical examination
2. Complete blood count, to establish whether the anemia is only due to one cell line (e.g., the red cell line only) or is part of a three-cell-line abnormality (abnormality of red cell count, white blood cell count, and platelet count)
3. Determination of the morphologic characteristics of the anemia based on blood smear and consideration of the MCV and RDW and morphologic consideration of white blood cell and platelet morphology.²

There appear to be racial differences in hemoglobin levels. Black children have levels about 0.5 g/dl lower than those of white and Asian children of comparable age and socioeconomic status, perhaps in part as a result of the high incidence of α -thalassemia in blacks.³

Although a reduction in the amount of circulating hemoglobin decreases the oxygen-carrying capacity of the blood, few clinical disturbances occur until the hemoglobin level falls below 7-8 g/dl. Below this level, pallor becomes evident in the mucous membranes.^{4,5}

Physiologic adjustments to anemia include increased cardiac output, increased oxygen extraction (increased arteriovenous oxygen difference), and a shunting of blood flow toward vital organs and tissues. In addition, the concentration of 2,3-diphosphoglycerate (2,3-DPG) increases within the RBC. The resultant "shift to the right" of the oxygen dissociation curve, reducing the affinity of hemoglobin for oxygen, results in more complete transfer of oxygen to the tissues. The same shift in the oxygen dissociation curve also may occur at high altitude. When moderately severe anemia develops

slowly surprisingly few symptoms or objective findings may be evident.^{6,7}

MATERIAL AND METHODS

The cross sectional study was carried out in the department of paediatrics, AL Kharma Teaching Hospital- Wasit, over a three months period from 1st of Sept 2012 to 1st of December of same year. 90 children in age from 1-5 years whom presented to consultant clinic with any symptoms rather than pallor or other hematological problems were enrolled in this study and information was recorded on a forma prepared for this purpose. Details history from the mother was taken regarding feeding, vaccination, housing, developmental history, repeated illnesses and other familial and social information.

Children with hematological problem as thalassemia or sickle cell anemia were excluded. CBC was done to all patients enrolled in the study.

Hb level below 10.5 g/dl.²

Statistical analysis

Patient data were tabulated and processed using SPSS (Statistical Package for the Social Sciences 13.0) for windows.⁸ Qualitative data are expressed as frequency and percentage, quantitative data as mean and median. P-values equal or less than 0.05 were considered significant.

Table 1: Demographic data for 90 patients

Item	No. (%)
Male	49(54.4)
Female	41(45.6)
Urban area	84(93.3)
Rural area	6(6.7)
Breast feeding	4(4.4)
Bottle feeding	7(7.8)
Mixed feeding	51(56.7)
Ordinary feeding	28(31.1)
Father education	
Illiterate	29(32.2)
Reading and writing	56(62.2)
Educated	5(5.6)
Mother education	
Illiterate	48(53.3)
Reading and writing	37(41.1)
Educated	5(5.6)
Family history of anaemia	11(12.2)
History of PICA	26(28.9)
History of breath holding attack	13(14.4)
History of prematurity	4(4.4)
History twin	1(1.1)
History of chronic diarrhoea	16(17.8)
History of frequent antibiotics use	74(82.2)
History of repeated infection	71(78.9)
Pallor	63(70)
Blue sclera	3(3.3)
Organomgaly	0
Angular stomatitis	1(1.1)

Table 2: Descriptive data for 90 patients

Item	Minimum	Maximum	Mean	SD
Age (year)	1	5	2.6	1.2
Hb g/dl	6.8	13	10.2	1.2
MCV f/L	51	95	71.7	8.3
MCH pg	13	31	22.7	3.2
MCHC g/L	271	346	318.2	16.6
PCV L/L	24	41	32.7	3.5
RBC 10¹²/L	3 100	5 680	4 590	46.6
RDW	11	19	13.6	1.5
Platelet 10⁹/L	59	606	343	107

RESULTS

For 90 child involved in the study, table No.1 shows the demographic data. 54% of the analysed children were male. Most of them were form urban area (more than 90%). Half of them were mixed feeding (57%). About 60% of father's children were just writing and reading, while more than half of the mothers were illiterate. About one third of the children were suffering from pica without medical seeking.

Table 2 shows the descriptive data for the children as mean haemoglobin was 10 g/dl and mean MCV was 71 fl. Most type of anemia is hypochromic microcytic anemia. Fig 1 shows the classification of the children according to Hb level to two group anemic group (Hb level below 11 g/dl), not anemic group if Hb level were equal or more than 11 g/dl. Anemic group compose more than 50 % of the patients.

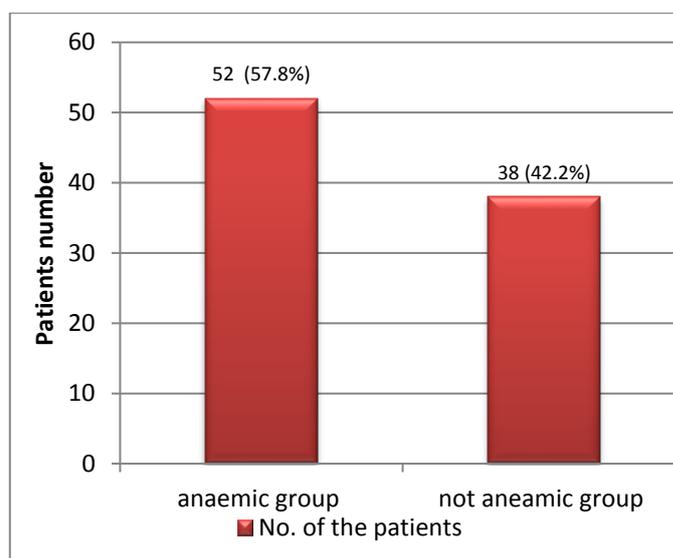


Fig 1: Patients group according to Hb level.

Table 3 shows difference in blood incidence between two groups, blood incidence were low in anemic group which significantly differ from non-anemic group (P value less than 0.05) except for platelet count and Red

cell distribution width (RDW). Pallor and age were significantly differing between anemic and non-anemic group, while sex was not differ as showed in table 4, and Fig 2 respectively.

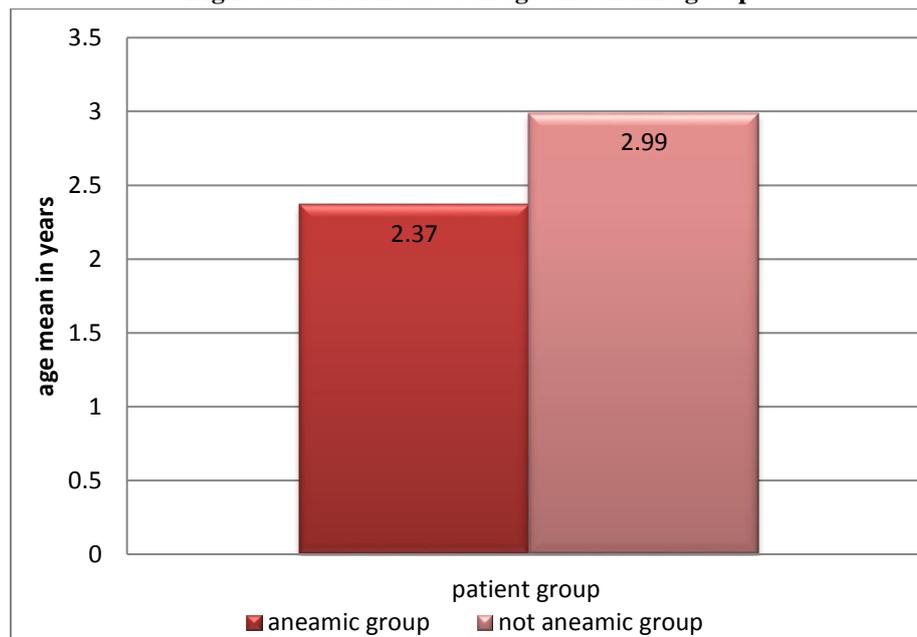
Table 3: Correlation between blood parameters and anemic group

Item	Anaemic group	Not anaemic group	P value
Number	52	38	
Hb level	9.4± 0.87	11.4± 0.6	0.001
PCV	30.5±2.7	35.6±2.1	0.001
RBC count	448.8±50	474.7±35.4	0.001
MCV	68.8±9	75.6±5	0.009
MCHC	311±17	327±9	0.001
MCH	21±3.3	24±2.1	0.001
Platelet count	347±103	338±114	0.6
RDW	22.4±21	18.6±10	0.3

Table No. 4: Correlation between anaemic group and pallor

Item	Anaemic group (%)	Not anaemic group (%)	P value
Pallor	41 (80.4)	22 (24.4)	0.019
Male	27 (30)	22 (24.4)	0.3
Female	25(27.8)	16 (17.8)	
Mixed feed	33 (36.7)	18 (20)	0.2
Ordinary feed	14 (15.6)	14 (15.63)	
Illiterate father	19 (21.1)	10 (11.1)	0.1
Illiterate mother	31(34.4)	17 (18.9)	0.3
Free job father	42 (46.7)	28 (31.1)	0.2
Rural area	4 (4.4)	2 (2.2)	0.4

Fig 2: Correlation between age and anemic group



DISCUSSION

This study revealed that 32% of father and 53% of the mother were illiterate as showed in table 1 of demographic data. 70% of the children were clinical pale with no medical care seeking as showed in table 2. The mean of Hb was 10.2 g/dl with range (6.8-13), most of children with sign of hypochromic microcytic anemia [mean of MCV 71 f/L, mean of MCH 22.7 gp].

Around two third of the children (57.8%) were anemic with Hb level below 2SD of mean. Which is higher than what reported in Fadila study in Kuwait (17.6%), Bijan study in Iran (43.9), Khalid study in Saudi Arabia (37.2%), and Abdulrhman study of Gulf countries (13%).⁹⁻¹² And highly differ from what reported in industrialized countries such Austria 10.5%, Belgium

8.7% and lowest than what reported in south Asia such as India 74.3%.⁹ These difference may be explained by socio economic state of the countries.

There was statistically significant difference (p value less than 0.05) regarding Hb, PCV, RBC count, MCV, MCH, and MCHC. These results is similar to what reported in Fadila study in Kuwait.⁹

Most of the children were have pallor in anemic group (80%), which is most important sign to take action form physician to early mange anemia. Table 4 showed that no statistically significant difference regarding anemia and sex of the children (p value 0.3) which was similar to what reported in Fadila study.⁹

Anemia was reported more in children with delayed milk feeding (mixed feeding), (36.7% of the children), with no statistically significant difference, which similar to what reported in Bijan study.¹⁰

Anemia was reported more in illiterate mother and illiterate father with no statistically significant difference. Bijan study shows than prevalence of anemia was equal in both illiterate and not illiterate mother.¹⁰

Children of father who works in private sector had high incidence of anemia (46.7%) which higher than what reported in Bijan study.¹⁰ This can be explained by the fact that in Iraq, the governmental workers had high salary and acceptable economic state.

Fig 2 showed anemia reported more in younger age (mean age in anemic group was 2.3 year 0.01), which is similar to what reported in Bijan study in Iran.¹⁰

CONCLUSION

Prevalence of anemia among children in Wasit province is higher than that reported in other countries in the Arab Gulf Region. Attention should be given to health education in the mass media and in child and maternity clinics. Mothers should receive appropriate advice on the benefits and side-effects of iron supplementation. Control of infectious diseases, especially parasitic infection is highly recommended. Education on healthy food habits with emphasis on increased consumption of foods that enhance iron absorption should be included in any health and nutrition education programme. Information on causes and management of anemia is important for school children and can be included in school curricula. Studies on factors determining anemia in Iraq are highly recommended.

REFERENCES

1. Philip L. Classification and diagnosis of anemia during childhood . In: Lanzkowsky P, editor. Manual of

Pediatric Hematology and Oncology. 4th ed. Elsevier Academic press; 2005. p.1-11.

2. Robin k.O, Robert D.C: blood diseas . In: kliegman RM, Behrman RE, Jenson HB, Stanton BF, editors. Nelson Text book of pediatrics. 18th ed. Philadelphia: Saunders; 2007. 447 p. 2000-6.

3. Greer JP, Foerster J, Lukens J, et al: Wintrobe's Clinical Hematology, 11th ed Baltimore, Williams & Wilkins, 2004.

4. Hoffman R, Benz EJ, Shattil SJ, et al (editors): Hematology: Basic Principles and Practice,4th ed. New York, Churchill Livingstone, 2005.

5. Nathan DG, Orkin SH, Ginsburg O, Look NI: Nathan and Oski's Hematology of Infancy and Childhood,5th ed. Philadelphia,W B Saunders2, 003.

6. Baggett HC, Parkinson AJ, Muth PT, et al: Endemic iron deficiency associated with Helicobacter pylori infection among school-aged children in Alaska. Pediatrics 2005 ;1 17.

7. Brotanek JM, Halterman JS, Auinger P et al: Iron deficiency prolonged bottle feeding and racial/ethnic disparities in young children. Pediatr Adolesc 2005;159:1038-1042.

8. Nourusis MJ. APSS statistical software. SPSS:Base and Advanced statistics 13.0. Chicago, SPSS Inc, 2004.

9. Fadila A.A, Mona A.S, Fatema S et al : Prevalence and associated factors for iron deficiency anaemia among Kuwaiti children. Bull. Alex. Fac. Med. 42 No 2, 2006.

10. Bijan K, Khodmorad Z, Ali G, Ramin T. Iron deficiency anaemia among children in southwest Iran. Food and nutrition bulletin, vol. 28, no 4, 2007.

11. Khalid A M, Taha A K. Micronutrient status in Saudi Arabia. Bahrain med bull 2001; 23, 135-39.

12. Abdulrahman O M. Iron deficiency anaemia in the Arab gulf countries: the need for action. Bahrain medical bulletin, vol. 23, No. 2, June 2001.

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