

Anemia in Children of Hazara Division

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ABSTRACT

Objectives: To determine the frequency of anemia in children of Hazara Division.

Study Design: Cross-sectional / observational study.

Place and Duration of Study: This study was carried out at the Pediatric Outpatient of Ayub Teaching Hospital Abbottabad from 1st January, 2015 to 30th June, 2015.

Materials and Methods: Three hundred and seventy five children were selected randomly using random number tables from Hazara Division coming to Pediatric Outpatient of Ayub Teaching Hospital Abbottabad. Their age range was 0-18 years. Their diagnoses were ascertained, recorded and analysed.

Results: Majority of the patients were male and were in the age-range of 2-10 years. Anemia was present in 3.9999 % of children. Iron deficiency anemia was the most common cause of anemia in these children.

Conclusions: Majority of the children were male and were in the age range of 2-10 years. Anemia was present in 3.9999% of these children and iron deficiency was the most common cause of it.

Key Words: Children, Anemia, Iron deficiency.

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INTRODUCTION

Worldwide anemia is common in children. This is especially true in developing countries like Pakistan. Iron deficiency is the commonest cause worldwide. Anemia besides causing excess morbidity and mortality in children, also adversely affects their mental development. The latter leads to less ability to get education and work, resulting in another economically deprived generation.

Therefore control of anemia in children can change the future of nations.^{1,2,3}

Iron deficiency anemia (IDA) is the most common cause of anemia. Prior to six months of life it is caused by low iron stores, prematurity, low birth weight, perinatal blood loss or hemorrhage. Between 6-24 months it is caused by poor dietary intake of iron. After 24 months of age it is caused by chronic blood loss.

Iron deficiency anemia produces pallor and fatigue. Microcytic hypochromic anemia with low serum iron, ferritin and transferrin saturation with increased iron binding capacity is diagnostic of IDA.

Treatment is with elemental iron in a dose of 4-6 mg/kg/d. Increase in reticulocyte count confirms the diagnosis and documents compliance and response to therapy. Anemia corrects in 4-6 weeks of iron therapy. Iron is continued for further 3 months to replenish iron stores⁴.

Megaloblastic anemia is caused by deficiency of vitamin B12, folic acid or both. The causes of vitamin B12 deficiency are dietary (vegans) intestinal malabsorption, inborn error of metabolism and pernicious anemia. The causes of folic acid deficiency are dietary (severe malnutrition, use of goat's milk), malabsorption, drugs (anticonvulsants or cytotoxics) and increased requirements (rapid growth, chronic hemolytic anemia). This anemia presents as pallor, mild jaundice, smooth beefy red tongue, irritability, paresthesias, weakness or an unsteady gait. The laboratory findings are macrocytosis, hypersegmented neutrophils with normal or decreased WBC and platelet count.

Diagnosis of vitamin B12 deficiency is based on abnormal serum methylmalonic acid and homocysteine levels. Folic acid deficiency is diagnosed by low red cell folate level.

Treatment of vitamin B12 deficiency requires i.m. or parenteral vitamin B12. Folic acid deficiency is treated with oral folic acid⁵.

Aplastic anemia is characterized by peripheral pancytopenia with a hypocellular bone marrow. It is classified as congenital and acquired aplastic anemia.

Acquired aplastic anemia is the most common form. Its causes are idiopathic (50% of cases), drugs (chloramphenicol, phenylbutazone, sulfonamide, NSAIDs, anticonvulsants) toxins (benzene, insecticides, heavy metals) and infections (non-A, non-B and non-C viral hepatitis, infectious mononucleosis, HIV).

Aplastic anemia produces weakness, fatigue, pallor, petechiae, purpura, bleeding and fevers. There is

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normocytic anemia with low reticulocyte count, leucopenia and thrombocytopenia. Bone marrow aspiration & biopsy is diagnostic. Complications include overwhelming infection and hemorrhage.

The treatments available are bone marrow transplantation (BMT) or immune suppression.

The prognosis is extremely poor (death within 6-12 months) if BMT is not available and immune-suppression is not effective. BMT produces greater than 80% long term survival, while many treated with immune suppression have sustained complete remissions.^{5,6}

There are very few studies about anemia in Pakistani children. Khan F.R. et al studied anemia in 85 children in department of hematology Sheikh Zayed Hospital and FPGMI Lahore and found out that iron deficiency anemia was most common (92%)⁷.

Syed SSM et al studied anemia in 32 children aged 1 month to 12 years in DHQ hospital of Sialkot and found that 44.44% of them had anemia⁸.

Manzoor A. et al studied anemia in school children of ages 6 to 12 years in Lahore and found that 10.5% had anemia and most common anemia was microcytic hypochromic⁹.

Alam M. et al studied anemia in 978 school children in Skardu and found out that 37.01% had anemia¹⁰.

Kazi MY et al studied aplastic anemia in children in Mayo Hospital Lahore and found that 80% of them had drug induced aplastic anemia¹¹.

Hazara Division comprises of Abbottabad, Mansehra and Haripur Districts. There is virtually no study about anemia in pediatric population of Hazara Division after searching the published literature in www.pakmedinet.com.

This study was conducted to evaluate the frequency of different anemias in children of Hazara Division. This study was carried out in Ayub Teaching Hospital Abbottabad (ATH), because it is the only tertiary care hospital of Hazara Division and patients from all areas of Hazara Division come to it. Thus study conducted in ATH is true representative of Hazara Division. The information gathered from this study will help in early recognition and treatment of major causes of anemia in children of Hazara Division. This information will also be useful for proper focusing and planning of health care activities like preventive measures and education of health personnel regarding burden of anemia in children of Hazara Division. All this will lead to reduction in morbidity and mortality due to anemia in children of Hazara Division.

MATERIALS AND METHODS

This cross sectional study was conducted in Pediatric OPD of Ayub Teaching Hospital Complex Abbottabad from 1st January, 2015 to 30th June, 2015.

The number of children studied was 375. This sample size was calculated by using the equation provided by Yamane T

$$n = \frac{N}{1 + N(e)^2}$$

where n is the sample size

N is the anticipated population size

e is the level of precision and is assumed to be $\pm 5\%$ precision.

A 95% confidence interval is assumed for this equation. The anticipated pediatric population attending pediatric OPD of ATH was calculated by counting the number of patients attending the Pediatric OPD over a period of 12 weeks and comparing the counted result with the available records and this came out to be 6000 children for six months.

Sampling technique was simple random using random number tables. Only children with definitive diagnosis from Hazara Division aged 0-18 yrs were included. The consent of parents was obtained and study was approved by Ethical Committee of ATH. Age on last birthday was recorded and ascertained through birth certificate or school certificate or form B or mother's statement.

The data was analyzed using SPSS (version 21.0) for windows.

Descriptive statistics was used to calculate mean and SD for age. Relative frequency (%) was calculated for sex and each disease.

RESULTS

Majority of children were male (66.6666%; n=250). Females constituted 33.3334% (n=125) of the total. The male to female ratio was 2:1 (Table No. I). Majority children were in the age-range of 2-5 yrs (31.7333%).

Table No I: Sex Distribution Of Children Of Hazara Division

Sex	Number of patients	Relative frequency
Males	250	66.6667%
Females	125	33.3333%

Table No 2: Age Distribution of Children of Hazara Division

Age group	No. of patients	Relative frequency	Male:female ratio
0-28 days	10	2.6666	4:1
2mo-1yr	92	24.5333	2.2857:1
2yrs-5yrs	119	31.7333	1.975:1
6yrs-10yrs	81	21.6	1.4545:1
11yrs-15yrs	68	18.1333	2.5789:1
16yrs-18yrs	5	1.3333	1:1.5

The mean for age was 5.588 yrs and the SD for age was 4.7567 yrs (Table No. 2).

Anemia was the fifth (3.9999%) most common disease of children in this study. Iron deficiency was the most common anemia seen in children of Hazara Division in this study. It had equal sex incidence with mean age of 4.7708 yrs.

Megaloblastic anemia was the second most common cause of anemia seen in this study. The mean age for this anemia was 6.6666 yrs.

A single case of aplastic anemia was seen in a 12 year old boy in the present study (Table No.3).

DISCUSSION

This study showed that number of male children (66.6666%) was greater than that of female children (33.3333%) with a male to female ratio of 2:1. This finding was similar to the observation of Memon IA et al¹² that majority (69.36%) of children brought to a consultant pediatric chamber in Nawab Shah were males.

Majority (56.2666%) of children were in the age-range of 2-5 yrs (31.7333%). This finding was similar to the observation of U.S. Census Bureau International Database¹³. There was minimal representation of 0-28 days and 16-18 years age-groups due to routine presentation and referral of these groups to neonatal unit and adult medicine unit respectively at ATH.

Anemia was the fifth most common disease (4%) seen in children of Hazara Division in this study and iron deficiency anemia was the most common cause of it (80%). Internationally iron deficiency anemia is most common form of anemia and is more common in children &

women and in developing countries due to poor diet and intestinal worms⁴. Khan FR et al⁷ found that 92% of children studied had iron deficiency anemia. Study of Memon IA et al¹² found out that 26.66% of children had anemia. This study revealed low incidence of anemia in children in Hazara Division. Further studies are required to elaborate this.

Megaloblastic anemia and aplastic anemia were other causes of anemia. One case of acquired aplastic anemia secondary to cotrimoxazole was seen in a 12 year old boy in this study. The profile of this case was similar to study of Kazi MY et al¹¹ in which he noted that drug induced aplastic anemia was most common form of aplastic anemia in Pakistani children.

CONCLUSION

Majority of children were male and were in the age-range of 2-10 years. Anemia was present in 3.9999% of

these children and iron deficiency was the most common cause of it.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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