To study the morphological spectrum of anemias in pediatric age group

[1]Dr Tapasya, M.D. Pathology, Dr. S. N. Medical College, Jodhpur (RAJ.)

Corresponding Author: Dr Tapasya, M.D. Pathology, Dr. S. N. Medical College, Jodhpur (RAJ.)

Abstract

Background: The aim of present study was to know the spectrum of anemia in pediatric age group using different haematological and biochemical investigations.

Methods: Total 100 patients were enrolled for this study over a period of one year. Anemia was morphologically typed and comparison was done with PBF. Reticulocyte count was done on each and every patient further correlated its value with morphological typing of anemias in patient.

Results: Out of the 100 cases, morphologically anemia was detected using PBF examination and found microcytic hypochromic anemia (47.00%) followed by dimorphic anemia (22.00%), normocytic normochromic (17.00%), macrocytic anemia (10.00%) and hemolytic anemia (4.00%).

Conclusion: Haematological tests can be used for early detection of anemia. Preventive programme for control of anemia in children should be made accompanied by measures of providing appropriate nutritional requirements

Keywords Microcytic, Anemia, Haematological

Introduction

Anemia is a condition in which the number of red blood cells (and subsequently oxygen-carrying capacity) is insufficient to meet the body's physiologic needs. Specific physiologic needs of one's individual vary with the age, gender, residential height above sea level (altitude), smoking habits and various phases of pregnancy[1]

During childhood total body iron demand increases in proportion to body weight. After 6 months, growth slows and the diet becomes varied. Inspite of adequate iron diet, laboratory parameters of serum iron and TF saturation remain statically low[2]

At pubertal age, the secondary growth phase increases iron requirements to allow for the increase in red cell and muscle mass. This demand for more iron is particularly high in boys whose increment in lean body mass is on average double that seen in girls. In girls, as the growth spurt ends , menstruation starts and there is a compulsive need for extra iron to compensate for menstrual blood loss. Pregnancy can further aggravates the iron intake requirement of fertile females[3].

Dietary factors also play important role in developing Iron deficiency in early childhood. Human breast milk has been found to have low total content of iron. Alike heme iron, the iron present in breast milk is highly bioavailable and able to increase the amount of iron absorbed from other food sources in the early weaning diet[4]

Materials And Methods

Total 100 patients were enrolled for this study over a period of one year. Anemia was morphologically typed and comparison was done with PBF. Reticulocyte count was done on each and every patient further correlated its value with morphological typing of anemias in patient.

Inclusion Criteria

Patients of pediatric age group 1-12 yrs. coming to as IPD patients showing anemia (low Hb as per age criteria of WHO) on automated 5-part analyzer.

Exclusion Criteria

History of recent blood transfusion (within 3 months).

Uncooperative subjects.

Results

Commonest clinical feature associated was pallor (86.00%) followed by generalized weakness (85.00%),fever (61.00%), protein energy malnutrition (42.00%),developmental delay/weakness (20.00%) , pica (14.00%), koilonychia/nail changes (9.00%), seizure (8.00%), hepatomegaly (2.00%) ,splenomegaly (1.5%) and facial edema (1%).Whereas in my study pallor was commonest clinical association (99.00%) followed by hepatomegaly (38.00%) , splenomegaly (24.00%) ,jaundice (13.00%) , severe acute malnutrition (8.00%), facial edema (8.00%), hemolytic facies (3.00%) and lymphadenopathy (2.00%).

Table 1: Morphological spectrum of anemias using PBF examination overall in this study

PBF typing	No. of patients	Percentage
Dimorphic Anemia (DMA)	22	22.00
HemolyticAnemia (HA)	4	4.00
Macrocytic Anemia (MA)	10	10.00
Microcytic hypochromic Anemia (MHA)	47	47.00
Normocytic normochromic Anemia (NCNC)	17	17.00
Total	100	100.00

Out of the 100 cases, morphologically anemia was detected using PBF examination and found microcytic hypochromic anemia (47.00%) followed by dimorphic anemia (22.00%), normocytic normochromic (17.00%), macrocytic anemia (10.00%) and hemolytic anemia (4.00%).
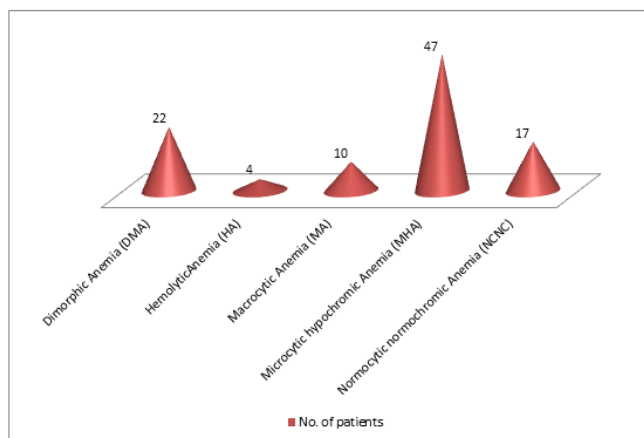
Discussion

Out of the 100 cases, morphologically anemia was detected using PBF examination and found microcytic hypochromic anemia (47.00%) followed by dimorphic anemia (22.00%), normocytic normochromic (17.00%), macrocytic anemia (10.00%) and hemolytic anemia (4.00%).

Sastry C.P.V[5] in his study found that peripheral smear examination showed Microcytichypochromic anemia in 81.8% (90/110). Dimorphic anemia was seen in 9.09 %. Normocytic Normochromic anemia was seen in 9.09 % of patients. Venkatesh G [6]observed Microcytic hypochromic anemia in 54.4%, macrocytic hypochromic anemia is seen in 11.8% and dimorphic anemia is seen in36.6% of patients[7]

Commonest clinical feature associated was pallor (86.00%) followed by generalized weakness (85.00%),fever (61.00%), protein energy malnutrition (42.00%),developmental delay/weakness (20.00%) , pica (14.00%), koilonychia/nail changes (9.00%), seizure (8.00%), hepatomegaly (2.00%) ,splenomegaly (1.5%) and facial edema (1%).Whereas in my study pallor was commonest clinical association (99.00%) followed by hepatomegaly (38.00%) , splenomegaly (24.00%) ,jaundice (13.00%) , severe acute malnutrition (8.00%), facial edema (8.00%), hemolytic facies (3.00%) and lymphadenopathy (2.00%).

Sunil Gomber et al (1998)[8] studied 29 patients of 3 months to 12 yrs which were detected macrocytic anemia on PBF examination. These had pallor (100%) in all cases, followed by Hepatomegaly (66%), Protein energy malnutrition (48%), splenomegaly (21%), bleeding manifestations (17.2%), focal seizures (6.8%) and infantile tremor syndrome (6.8%). In my study pallor (99.05%) is seen in almost all cases followed by hepatomegaly (34.48%), splenomegaly (20.68%), severe acute malnutrition and jaundice (17.24%), facial edema (13.79%) and lymphadenopathy (3.44%)

Conclusion

Haematological tests can be used for early detection of anemia. Preventive programme for control of anemia in children should be made accompanied by measures of providing appropriate nutritional requirements.

References

1. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. WHO/NMH/NHD/MNM/11.1.

2. Dr.Tejindar Singh's Atlas and Text of hematology, 2018, fourth edition

3. Barbara J Bain, David M Clark, Bridge S Wilkins, Bone marrow pathology,2019, 5th edition.

4. Robert J Arceci , Ian M. Hann , Owen P. Smith, Pediatric Hematology, 3RD Edition.

5. RamanaSastry C.P.V. Study on clinical and hematological profile of Anemia in children aged 5 to 12 years in rural Telangana. J Pediatr Res 2017;4(07):488-493

6. Venkatesh G, Soubhagya T, Bela H Shah. Clinical Profile of Anemia in Children. IOSR Journal of Dental and Medical Sciences 2013;10(5):65-69.

7. Gupte S: PediatricHematology . In Gupte S. The Short Textbook of Pediatrics. 10th edn. New Delhi; Jaypee. 2004:454-62

8. Sunil Gomber et al, Kusum Kela ,Neelam Dhingra ,Clinico-Hematological Profile of Megaloblastic Anemia, IJP,1998;35