

Investigation of Management Strategies for Pediatric Patients with Severe Anemia

Satish Kumar¹, Vimal Kumar², Kishor Kumar Sinha³, Ankur Priyadarshi⁴

¹Senior Resident, Department of Paediatrics, JLNMCH, Bhagalpur

²Senior Resident, Department of Paediatrics, JLNMCH, Bhagalpur

³Associate Professor & HOD, Department of Paediatrics, JLNMCH, Bhagalpur

⁴Assistant Professor, Department of Paediatrics, JLNMCH, Bhagalpur

Received: 1703-2024 / Revised: 16-04-2024 / Accepted: 11-05-2024

Corresponding Author: Dr. Vimal Kumar

Conflict of interest: Nil

Abstract:

Background: Most common type of anemia in developing countries is nutritional anemia. Nutritional anemia can be due to iron deficiency (most common cause), folic acid deficiency, and Vitamin B12 deficiency or may be combination of these. Other types include hemolytic anemia, which can be either congenital or acquired. In India the prevalence is about 51%.

Methods: In our study of 100 patients admitted to the Paediatrics Department, at JLNMCH, Bhagalpur. the entire exclusion and inclusion criterion were studied. All the patients were subjected to a detailed history, physical examination and further investigation and management. All cases were examined in detail according to proforma, investigations, pathological examinations and other special tests were also done.

Results: Pallor has been observed in 100% of patients. Fever was evident in 62% of patients followed by weakness in 77% of patients, cough in 34 %, diarrhea in 4%, breathlessness in 4% etc. 73% patients were treated with oral medication while 9 % required oral injectables while remaining required mixed pattern therapy. We advised nutrition advisory / counseling for all our patients.

Conclusions: In our study, severe anemia was found to be associated with morbidity and other complications. The main principles in management of iron deficiency anemia include investigation and elimination of the cause leading to iron deficiency, replacement of deficiency, improvement of nutrition and education of the patient and family.

Keywords: Severe Anemia, Vit B12 Deficiency.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

The World Health Organization (WHO) estimates that 1.62 billion people worldwide have anemia, with a high rate of anemia (47.4%) among pre-schoolers; of these 293 million children, 89 million live in India. [1] The third National Family Health Survey (NFHS) 2005-2006 revealed that at least 80% of Indian children aged 12-23 have anemia. [2] Anemia is defined as a hemoglobin (Hb) level below the 5th percentile of age. The causes vary from age to age. Primary care physicians are the first people to come in contact with children with many health problems. Most children with anemia are visually impaired but have unusual presentation, and the condition is found in laboratory tests. Medium microcytic anemia may be treated by considering oral iron therapy in children 6–6 months of age, with risk factors for iron deficiency anemia. If anemia is severe or does not respond to iron therapy, the patient should be tested for intestinal blood loss.

The most common type of anemia in developing countries is related to nutritional disorder. Iron

deficiency (the most common cause), folic acid deficiency, and Vitamin B12 deficiency or may be a combination of these. Other types include hemolytic anemia, which may be congenital or acquired. Causes of congenital malformations include membrane degeneration, hemoglobin deficiency and enzyme deficiency while the detected causes may be protective or unprotected. Aplastic anemia, anemia due to blood loss and chronic anemia are other types of anemia. Anemia is a major health problem worldwide, especially in developing countries. This problem is very safe and can be easily treated. In India the prevalence is about 51%.

Methodology:

In our study, of 100 patients admitted to the Paediatrics Department, JLNMCH, Bhagalpur, Bihar. all the exclusion and inclusion criterion were studied. All the patients were subjected to a detailed history, physical examination and further investigation and management. All cases were examined in detail according to proforma, investigations, pathological

examinations and other special tests were also done. The patients of age group 6 months to 59 months admitted in pediatric ward having severe anemia (Hb <7 gm/dl) as per WHO criteria were subjects of our study.

An appropriate sample size of 100 was considered for study. Consecutive sampling was done amongst admitted children in hospital. An informed consent was obtained from the parents of enrolled children. Child with Hb>7 gm/dl, age <6 or >59 months, lack of parental consent, history of recent surgery or blood transfusion and children with known cause of anemia or active bleeding were excluded from the study. In our study, of 100 patients admitted to the

Paediatric Ward, JLNCH, Bhagalpur. all the exclusion and inclusion criterion were studied. All the patients were subjected to a detailed history, physical examination and further investigation and management. All cases were examined in detail according to proforma, investigations, pathological examination and other special tests were done. We included only pediatric age group patients in this study including age less than 16 years.

Results

It is observed that all three types of anemia were more in 1- 2years of age group.

Table 1: Distribution of different types of Anemia

Type of anemia	Number of patients
Iron deficiency anemia	79
Megaloblastic anemia	11
Dimorphic anemia	10

In the current study iron deficiency anemia is most common followed by dimorphic anemia and megaloblastic anemia.

Table 2: Clinical features

Clinical features	Number of patients
Pallor	100
Weakness	77
Cough	34
Breathless ness & diarrhea	4

Pallor has been observed in 100% of patients. Fever was evident in 62% of patients followed by weakness in 77% of patients, cough in 34 %, diarrhea in 4%, breathlessness in 4% etc.

Table 3: Clinical management

Type of anemia	Number of patients
Oral Medication	73
Injectable	9
Mixed	18

73% patients were treated with oral medication while 9% required oral injectables while remaining required mixed pattern therapy. We advised nutrition advisory / counseling for all our patients. Microcytic hypochromic anemia is seen in 75%, macrocytic hypochromic anemia is seen in 20% and dimorphic anemia is seen in 5% of patients.

Discussion

Anemia can be a variety of types, but most often in developing countries anemia is a healthy diet. Healthy anemia can be due to Iron deficiency (the most common cause), Folic acid deficiency, Vitamin B12 deficiency or it may be a combination of these factors, which may also produce a dimorphic image. Patients in the 6- to 59-month age group admitted to the pediatric ward with severe anemia (Hb <7 gm / dl) according to WHO guidelines were the focus of our study. A suitable sample size of 100 is considered for reading. Subsequent sampling was performed among children admitted to the hospital. Informed consent has been obtained from the parents

of registered children. A child with Hb> 7 gm / dl, <6 or >> 59 months old, lack of parental consent, history of recent surgery or blood transfusion and children with a known cause of anemia or active bleeding were not included in the study.

These conditions are evident in all forms of medicine from neonatology to geriatrics and public health and are an ongoing concern for all physicians. Other types include hemolytic anemia, which may be congenital or acquired. Causes of congenital malformations include membrane degeneration, hemoglobin deficiency and enzyme deficiency while the detected causes may be protective or unprotected. Aplastic anemia, anemia due to blood loss and chronic anemia are other types of anemia. In our study, 73% of patients were treated with oral medication while 9% needed oral injections while a combination therapy was still needed. We recommend nutritional counseling / advice to all our patients. Microcytic hypochromic anemia is seen in 75%, macrocytic hypochromic anemia is seen in 20% and

dimorphic anemia is seen in 5% of patients.

Parental iron treatment can be done when oral iron treatment is not tolerated, in cases where anemia should be treated immediately and with intestinal absorption problems including celiac disease or inflammatory bowel disease.

Healthy eating anemia is caused by a lack of iron, protein, B12, and other vitamins and minerals needed to build hemoglobin. Folic acid deficiency is a common combination of healthy eating anemia and iron deficiency anemia is the most common eating disorder. Symptoms of anemia include cyanosis, jaundice, and easy injury. In addition, patients with anemia may have memory and concentration problems, fatigue, lightheadedness, sensitivity to heat, low energy levels, shortness of breath, and light skin. Symptoms of severe or early anemia are very dangerous as the body cannot adapt to hemoglobin deficiency. This can lead to shock and death. Medium and moderate anemia has symptoms that gradually increase over time. [4] If patients believe they are at risk or have symptoms of anemia, they should consult their doctor.

Symptoms of unhealthy eating anemia can include fatigue and lack of energy. However, if symptoms persist, a person may have shortness of breath, rapid heartbeat, dizziness - especially on the hands, eyelids and nails, swelling of the ankles, hair loss, lightheadedness, forced and unusual cravings, constipation, depression, muscle spasms, numbness, or burning and chest pain. Those with healthy eating anemia often show little or no symptoms at all. Often, symptoms may not be as noticeable as milder forms of anemia with only minor symptoms.

Nutritional Anemia has many different causes, each of which is a nutritious or unhealthy diet. The causes of malnutrition are a lack of vitamins and minerals and the causes of malnutrition can be diseases. The first cause of this type of anemia however is iron deficiency. Lack of adequate iron, Vitamin B12, and folic acid impairs bone function. Iron deficiency in the human body can also result from wound infections. These germs live in the digestive tract and after many years cause ulcers in the lining of your stomach or small intestine. Therefore, a high percentage of patients with healthy eating anemia may have a gastrointestinal disorder that causes chronic blood loss. It has become quite common among active physicians to start treatment with iron, folic acid when it is considered that iron deficiency should be reduced and there is no need to transfuse blood in all

children with severe anemia (not heart failure) without bone marrow test. Upcoming major community-based trials and effective interventions are needed to eradicate the cause of anemia in children under 5

is one of the most important causes of illness. A peripheral blood smear test can give an accurate idea of the etiology of anemia. In some cases further investigation such as Hb electrophoresis or bone marrow test may be required depending on the suspected etiology. Delays in diagnosis can have a detrimental effect on the health and well-being of children.

Conclusion:

In our study, severe anemia was found to be associated with illness and other disorders. Key principles in the management of iron deficiency anemia include the investigation and eradication of the leading cause of iron deficiency, weight loss, nutritional development and patient and family education.

References:

1. Benoist B, McLean E, Egli I, Cogswell, editors. Worldwide Prevalence of Anaemia 1993– 2005. Geneva, Switzerland: World Health Organization; 2008.
2. National Family Health Survey (NFHS-3), 2005-2006: Key Findings. Mumbai, India: International Institute for Population Sciences; 2007.
3. Oski FA, Brugnara C, Nathan DG. Nathan and Oski's Hematology of Infancy and Childhood. Philadelphia: Saunders; 2003. A diagnostic approach to the anemic patient; pp. 409–18.
4. Bizzarro MJ, Colson E, Ehrenkranz RA. Differential diagnosis and management of anemia in the newborn. *Pediatr Clin North Am.* 2004; 51:1087–107.
5. Janus J, Moerschel SK. Evaluation of anemia in children. *Am Fam Physician.* 2010; 81:14 6 2–71.
6. Politt E. Iron deficiency and cognitive function. *Annu Rev Nutr.* 1993; 13:521–37
7. Lozoff B, Jimenez E, Wolf AW. Long-term developmental outcomes of infants with iron deficiency. *N Engl J Med.* 1991; 325:687–94.
8. Halterman JS, Kaczorowski JM, Aligne CA, Auinger P, Szilagyi PG. Iron deficiency and cognitive achievement among school-aged children and adolescents in the United States. *Pediatrics.* 2001; 107:1381–6.
9. Walter T, Kovalskys J, Stekel A. Effect of mild iron deficiency on infant mental development scores. *J Pediatr.* 1983; 102:519–22.