Original article

A Retrospective study on Clinical and Hematological Profile of Microcytic Hypochromic Anemia in Children

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Abstract:

Introduction: Anemia is the most important nutritional deficiencies affecting various social & socio-economic strata. Iron deficiency is the most common cause of nutritional anemia worldwide followed by folic acid & vit B-12 deficiency. Understanding anemia's complex etiology is crucial for developing effective interventions that address the specific causes of anemia & for monitoring health programs.

Materials& Methods : This was a Retrospective Observational Study which done at the Department of Pediatrics, Gulbarga Institute of medical Sciences, Kalaburagi, Karnataka. All children with age group of 1-12years admitted with clinical suspicion of Anemia between January 2021 to June 2022 were included.

Results: In our study, we found commonest age group was between 1-6 years (55%) and majority of children were belonged to lower socio economic status (62%). Most of the cases presented with acute infections (65%), followed by chronic infections (21%) and chronic non-infectious diseases (6%). In our study , most common clinical feature was pallor followed by nonspecific symptoms like generalized weakness and fever, vomiting, abdominal pain, cough. In the pediatric age group, IDA is the commonest type of anemia and is more common in infant and young children especially in lower SES which is very similar to other developing countries.We found, anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women.

Conclusion: We conclude, anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women. most common clinical feature was pallor followed by nonspecific symptoms like generalized weakness and fever, vomiting, abdominal pain, cough. Anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women.

Keywords: Hypochromic anemia , haematological profile , health issue

Introduction

Anemia is the global public health problem affecting the 1/3 rd of the world's population with major consequences for human health & affecting social & economic development. According to WHO, prevalence of anemia in pre-school children was 47% & school aged children was 24%. Prevalence & severity of anemia is higher in Developing countries, children & pregnant women are more vulnerable groups to anemia.[1]

Anemia is the most important nutritional deficiencies affecting various social & socio-economic strata. Iron deficiency is the most common cause of nutritional anemia worldwide followed by folic acid & vit B-12 deficiency. Understanding anemia's complex etiology is crucial for developing effective interventions that address the specific causes of anemia & for monitoring health programs.

The risk factors are most prevalent in low-middle -income countries, including nutritional deficiencies, infection/inflammation & genetic hemoglobin disorders. Further research is needed to find out the role of additional nutritional deficiencies, the contribution of infectious &

chronic disease, as well as the importance of genetic hemoglobin disorders.[2,3]

Materials& Methods

This was a Retrospective Observational Study which done at the Department of Pediatrics, Gulbarga Institute of medical Sciences, Kalaburagi, Karnataka.

Inclusion criteria

All children with age group of 1-12years admitted with clinical suspicion of Anemia between January 2021 to June 2022 were included.

Exclusion Criteria:

1. Age below one year and above twelve years.
2. Peripheral smear with Macrocytic and Dimorphic picture.
3. H/O transfusion within past two months.
4. Children on Hematinics.

Methodology

- **Place of study:** Department of Pediatrics, GIMS, Kalaburagi.
- **Duration of study:** 18months.
- **Study Design:** Retrospective observational study

Children aged 1-12 years with microcytic hypochromic anemia are selected with following inclusion and exclusion criteria.

Inclusion criteria:-

• Age group 1-12 years.
• Patients with clinical symptoms of anemia.
• Hemoglobin level: Age 1-6 years <10.5 g/dl, 7-12 years <11 g/dl.

Exclusion criteria:-

• Age below one year and above twelve years.
• Peripheral smear with Macrocytic and Dimorphic picture.
• H/O transfusion within past two months.
• Children on Hematinics nad with incomplete case records.

- Children aged 1-12 years with anemia based on clinical signs and symptoms will be selected. Their Medical records will be assessed for Hemoglobin level, Mean Corpuscular hemoglobin value, Mean corpuscular hemoglobin concentration and Mean corpuscular volume. Peripheral smears will be examined. Various RBC Indices will be calculated.
- With the help of these profiles, Children will be classified as microcytic hypochromic anaemia and will be included in the study. Children with dimorphic anaemia and Macrocytic blood picture will be excluded.

- To know the etiology of microcytic hypochromic anaemia, medical records will be assessed for serum iron, serum iron binding capacity, serum ferritin, transferrin saturation, Hemoglobin electrophoresis.
- If Serum Iron level, ferritin were decreased and Iron binding capacity increased, that condition will be categorized as Iron deficiency anaemia.
- If Serum Iron, ferritin were increased, Iron binding capacity was decreased - it indicates increased iron stores. Haemoglobin electrophoresis will be done to rule out/ confirm Thalassemia trait.
- If electrophoresis showed increased Hb A2 it indicated Thalassemia minor. If it showed increased Hb F it indicated Thalassemia major
- If Serum Iron, Serum Iron binding capacity were decreased, Serum ferritin was increased it will be categorized as anaemia of chronic disease.
- If smear showed basophilic stippling, possibility of lead poisoning will be considered and X ray for bone density will be looked for.

Results:

In our study, we found commonest age group was between 1-6 years (55%) and majority of children were belonged to lower socio economic status (62%). Most of the cases presented with acute infections (65%), followed by chronic infections (21%) and chronic non-infectious diseases (6%). In our study , most common clinical feature was pallor followed by nonspecific symptoms like generalized weakness and fever, vomiting, abdominal pain, cough. In the pediatric age group, IDA is the commonest type of anemia and is more common in infant and young children especially in lower SES which is very similar to other developing countries.We found, anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women.

Discussion:

This was a Retrospective Observational Study which done at the Department of Pediatrics,

Gulbarga Institute of medical Sciences, Kalaburagi, Karnataka. In a prospective observational study conducted by Reddy DM and his colleagues on prevalence pattern and various hematological as well as morphological types of anemia in children. The authors found that the problem of anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women. 21% children had mild anaemia, 39% had moderate anemia and 8.6% had severe anemia. Incidence of moderate & severe anemia is widespread among residential school children is higher than day school children.[5]

In a study done by Kubarat et al, on clinicopathological correlation of severe anemia in less than 5 year children, they found that the prevalence of severe anemia was 3.33%. Education , monthly income& occupation of parents are significantly associated with anemia. Among anemic children, 88% are Iron defiency anemia, 9% are dimorphic anemia & 3% hemolytic anemia with microcytic anemia picture in 93% of children.[6]

In a prospective study conducted by Arnab et al, on hematological profile of microcytic hypochromic anemia in children. They found that the commonest age group was between 1-6 years (45%) and majority of children were belonged to lower socio economic status (58.5%). Most of the cases presented with acute infections (58.5%), followed by chronic infections (25.8%) and chronic non-infectious diseases (10.8%). The commonest clinical feature was pallor followed by nonspecific symptoms like generalized weakness and fever, vomiting, abdominal pain, cough. In the pediatric age group, IDA is the commonest type of anemia and is more common in infant and young children especially in lower SES which is similar to other developing countries.[7]

In a study done by Abhayprakash et al, there was 56.6% prevalence of anemia. In children less than 5 years,21.3% were mildly anemic, 70% were moderate anemia,14.7%were severe anemia, whereas in children of age group 5-11 years mild, moderate & severe are 8.7%,71.7% & 19.6% respectivey. Anemia was significantly correlated with low weight,young age & with diagnosis of Acute lower respiratory disease.[8] The study done by Tezera et al ,shows prevalence of anemia among school children was 23%, prevalence of anemia in male & female school age children was 27% & 24% respectively.[9]

In a descriptive cross sectional study done by Bhandari et al on prevalence of anemia in adolescent girls attending to pediatric out patient department showed a higher prevalence of anemia (Out of 380 adolescent girls, 230 (60.5%) at 95% Confidence Interval (55.56-65.41) were anemic with mean hemoglobin of 11.138±1.954 gm/dl. The mean age was 14.57±2.107 years) than the national data. Proper education regarding personal and menstrual hygiene, weekly supplementation of iron in school, dietary habits and uplifting of economic status can prevent anemia in this population.[10-13]

Conclusion:

We conclude, anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women. most common clinical feature was pallor followed by nonspecific symptoms like generalized weakness and fever, vomiting, abdominal pain, cough. Anemia is widespread especially among residential school children, especially among boys rather than commonly considered groups of lactating and pregnant women.

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