Clinicopathological Patterns of Anemia in Children in the Age Group Ranging from 3 Years to 15 Years

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ABSTRACT

Background: The most common cause of anaemia in children is nutritional deficiency of iron, vitamin B12 and folic acid. Elderly patients with anaemia are heterogeneous in terms of clinical history, co-existing medical conditions, and concomitant medication use than young adults. Anaemia is a serious global nutritional issue. At least one-third of the population is thought to have experienced anaemia at some point.

Aim and Objective: To study the clinico-pathological patterns of anaemia in children in the age group ranging from 3 years to 15 years.

Methodology: The current study is a cross-sectional, descriptive analysis of 300 patients with anaemia who were hospitalized to the paediatric ward of Santosh Hospital in Ghaziabad between the ages of 3-15 years. During physical examination following signs and symptoms were noted: Pallor, edema, clubbing, skin problem (dryness, rashes, and irritation), abnormal pigmentation, coarse hair, puffiness of face, thinning of eyebrows, nail defects, ulceration, abnormalities in genitalia, hand and feet abnormalities, nose, eyes, cranium, ear and face.

Result: Anaemia was defined as having a haemoglobin level below 11.2 g/dl in children. Anaemia was prevalent in 56.6% of the population. Low weight, young age, and a diagnosis of acute lower respiratory disease were all substantially associated with anaemia. There was no correlation found between gender distribution and anaemia severity.

Conclusion: Children need to be screened early for anaemia and related disorders because they are the group most at risk for nutritional deficiencies. Early diagnosis and suitable care are made possible by initial screening and later diagnostic procedures.

Keywords: Nutritional deficiency, haemoglobin, Anaemia

1. INTRODUCTION

Anaemia is one of the major nutritional problem in India. Anaemia in infancy and early childhood affects growth and development and is associated with increased morbidity and mortality.[1] Anaemic children have reduced exercise capacity, slower rate of growth, impaired cognitive development, and delayed wound healing.[2] Children suffering from anaemia are at a higher risk of mortality, due to associated complications like malnutrition and infection. Prevalence rate of anaemia provides an important indicator of the nutritional status within the paediatric population.[3]

Most children with anaemia have abnormal haemoglobin or hematocrit levels on routine screening although they are asymptomatic. A child with anemia may present with pallor, fatigue, and jaundice, though may not be critically ill. Detailed history and findings on physical examination can reveal the underlying cause of anaemia.[3]

The clinicopathological patterns of anaemia in children are often reflected by their underlying etiopathogenetic factors. A detailed history, physical examination of the patient, complete hemogram test [4] along-with peripheral blood picture examination and the required biochemical investigations would help in starting the evaluation.

Another study of anaemia in hospitalized infants was conducted at GCS Medical College, Ahmedabad, Gujrat. In this study out of 206 hospitalized infants, 131 (63.6%) had anaemia. Male: female ratio was 1.3:1. The most common illness for which they were admitted was respiratory tract infections. 35.1% of the anaemic infants had low birth weight, 19.1% were born prematurely and 59.5% had a history of maternal anaemia. Only 42% were exclusively breast fed till 6 months of age and improper complementary feeding practices was observed in 61.8% of infants. Mild, moderate and severe anaemia was seen in 41.2%, 50.4% and 8.4% infants respectively. The study showed that 7 most common type of anaemia was microcytic hypochromic anaemia (67.2%), most likely due to iron deficiency. Preterm gestation, absence of exclusive breastfeeding, consumption of cow's milk, improper complementary feeding practices and presence of maternal anaemia were the risk factors found to be associated with development of anaemia in this study. [1]

2. METHODS AND MATERIALS

The current study is a cross-sectional, descriptive analysis of 300 patients between the ages of 3 -15 years who were diagnosed with anaemia and were admitted to the paediatric ward of Santosh Medical College & Hospital in Ghaziabad, as well as those who initially presented with other complaints and were unintentionally diagnosed with anaemia. The study, which took place between December 2018 and November 2019, comprised kids whose haemoglobin levels were less than 11.2 g/dl in the age group of 3 to 5 years and less than 12 g/dl in the age group of 5 to 15 years. All of the patients might have their venous blood drawn, and each sample was examined for the following parameters: haemoglobin (Hb) concentration, hematocrit (Hct), erythrocyte indices (mean corpuscular volume, mean corpuscular haemoglobin, and mean corpuscular haemoglobin concentration), differential count, erythrocyte sedimentation rate (ESR), red cell distribution width (RDW), serum iron levels, total iron binding capacity, serum ferritin, and Using WHO Hemoglobin concentrations for the diagnosis of anaemia and assessment of severity criteria, anaemia was graded among various age groups.

3. RESULTS

The present study was carried out on 300 anaemic paediatric patients in the age group of 3 years to 15 years. These 300 patients were categorized into two age groups namely pre-school and school-going children and their anaemic status was analyzed. There were 153 (51%) female cases and 147 (49%) male cases out of the 300 cases examined. 52 girls and 57 boys (38.78% and 38.78%, respectively) made up the pre-schoolers. 90 (61.22%) boys and

101 (66.01%) girls were among the students. 191 children between the ages of 5 and 15 were more affected than the 109 preschoolers between the ages of 3 and 5 (i.e., a larger percentage of children). In the present study, among 109 pre-school children, 46 (27.88 %) had mild anaemia, 51 (45.95 %) had moderate anaemia and 12(50%) had severe anaemia. Out of the 191 school going children, 119 (72.12 %) had mild anaemia, 60(54.05 %) had moderate anaemia and 12(50 %) had severe anaemia. Significance was observed between the severity of the anaemia and age group distribution. 165 out of 300 children had mild degree of anaemia amongst whom, 77 (50.32%) were females and 88 (59.86%) males. 111 children were found to have moderate degree of anaemia, amongst whom, 46 (31.29 %) were males and 65 (42.48 %) females. Severe degree of anaemia was found in 24 children amongst whom, 13 (8.84%) were males and 11 (7.19 %) were females. Non-significance was observed between the severity of the anaemia and gender. In this study, the common presenting symptom was fever, followed by gastrointestinal including vomiting, diarrhoea and pain abdomen followed by respiratory symptoms and failure to thrive. Urinary symptoms, irritability, throat pain, facial puffiness, jaundice, ear discharge and skin rash were seen in a few cases. Similarly, pallor was found in all the cases. The common signs included fever, hepatosplenomegaly, crepitations, sign of dehydration. Flag sign, jaundice, pedal edema, dry skin, muscle wasting, tachypnoea/tachycardia and wheezing were seen in some cases i.e seen in only 4-12 cases. After that acute diarrheal (72 cases) diseases followed by acute gastroenteritis (53 cases) and bronchopneumonia (40 cases) were the common clinical diagnosis associated with anemia. Upper respiratory tract infections, Protein energy malnutrition and Bronchial Asthma were seen in few (9-10 patients) cases. Dengue, Pulmonary tuberculosis and Acute appendicitis were the least common clinical diagnosis.

4. DISCUSSION

Anaemia is a major nutritional problem worldwide especially in developing countries like India.[1] Anaemia is the most common morbidity among micronutrients and affects health, education, economy, and productivity of the entire nation. The irreparable damage that anemia in childhood can cause particularly to the development of a young child on one hand and the knowledge and mechanism available for its control on the other, makes this silent morbidity completely unacceptable in modern times. In presents study, majority of anaemic children were females (51%). However, no significant association between anaemia severity and gender could be seen. Saba et al.[4], in their study has shown 58.4% males being affected. Muthusamy et al.[5], in their study had 55.6% affected males. However, Sharma et al.[6] found majority of anemic children to be girls (51.4%). But Chhabra et al.[7] in their hospital based study, like our study reported the dominance of males (64.4%). In different community based studies too, a dominance of males over females has been reported. The clinic-pathological patterns of anaemia as analyzed in the present study of 300 paediatric anaemia cases were compared with the other similar studies.

5. CONCLUSION

One of the most important areas for scope in the improvement of primary health care is prevention of nutritional deficiency anaemia because, it has been associated with delay in psychomotor development and increased morbidity and mortality in children. Steps need to be undertaken to educate the masses and improve their living standards, so that, the initial

symptoms of illness are not ignored and the children are brought to the hospital at the earliest for timely diagnosis and effective management.

Further studies with a comparative data from community along with detailed dietary intake and preference pattern might help in understanding and differentiating the prevalence, pattern and etiology of the anaemia in children. A uniform definition of screening criteria and an effective system to respond to abnormalities is the need of the hour. The present study was undertaken, keeping this need in view.

Limitations: One of the limitations of the study was our inability to get a detailed record of dietary and nutritional pattern and preferences of the children owing to which the etiology of anaemia could not be established completely.

6.   REFERENCES

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Table 1: Age group and Gender wise distribution of paediatric anaemia

Characteristics	Gender	Number	Percentage
Gender	Male	147	49
	Female	153	51
Age-group	3 to5 years	109	36.33
	5 to15 years	191	63.66
Total		300	100

Table 2: Age Group and Gender wise gradation of paediatric anaemia

Grade of Anemia	Mild(Hb%10-11.5gm/dl)	Moderate(Hb%7-10gm/dl)	Severe (Hb%<7gm/dl)	P value
3 to5 years	46(27.88%)	51(45.95%)	12(50%)	0.006
5 to15 years	119(72.12%)	60(54.05%)	12(50%)	
Male	88(59.86%)	46(31.29%)	13(8.84%)	0.181
Female	77(50.32%)	65(42.48%)	11(7.19%)	

Table 3: Distribution of anaemia based on Symptoms, Signs and Clinical diagnosis

Symptoms	No.	Signs	No.	Clinical diagnosis	No.
Gastro-intestinal symptoms	76	Irritability	13	Crepts,ronchii	48
Fever	129	Pallor	300	Wheeze	6
Respiratory symptoms	63	Signs of dehydration	55	Acute diarrheal diseases	72
Inability to gain weight	5	Fever	141	Broncho-pneumonia	40
Jaundice	6	Tachycardia/Tachypnoea	12	Acute gastroenteritis	53
Skinrash	4	Flag sign	8	Protein energy malnutrition	10
Urinary symptoms	13	Jaundice	6	Acute appendicitis	04
Ear discharge	4	Pedal edema	11	Pulmonary tuberculosis	04
Facial puffiness	6	Dry skin	7	Bronchial asthma	09
Throat Pain	7	Muscle wasting	6	Dengue	05
Failure to thrive	41	Hepatosplenomegaly	92	Upper respiratory tract infections	10