

## Clinico- Hematological Study of anaemia Among Adolescent Age Group of N.M.C.H, Jamuhar,Bihar

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### Abstract

**Background :** Anaemia is a major global health problem especially in developing countries like India and is a widespread nutritional problem more commonly seen in women and children during their most crucial periods like during pregnancy and growth, and as the studies on school age children were very few, hence this study was taken. **Objective:** To study the clinico-hematological profile of anaemia in adolescent age group at tertiary care centre, NMCH, Jamuhar, Bihar. **Methods:** A retrospective study done in adolescent age group presenting with anaemia during the period from January 2023 to June 2023. A total of 250 cases were studied. **Results:** A total of 250 cases were studied of which the maximum incidence of anaemia was found in the female age group Pallor was the commonest clinical sign followed by weakness and fatigability. Anaemia was graded according to WHO criteria. The maximum cases were under Grade I category (severe: Hb->10gm/dl) i.e. mild anaemia. Among the morphological type, majority were Microcytic hypochromic anaemia (64 %), Normocytic hypochromic anaemia (36 %), Dimorphic anaemia (2%). **Interpretation and conclusion:** Complete haemogram evaluation was analyzed with Erba-360 analyzer (5 parts). Leishman stain, New Methylene blue, May Grunwald Giemsa were used for peripheral smear. The most common type of anaemia was Microcytic hypochromic anaemia. Majority of the cases were from rural area (75%) than urban (25%). The present study concludes that early diagnosis and management will help in better cognitive and motor development in children.

**Keywords:** Anaemia; Microcytic hypochromic anaemia; Adolescent; Pallor; Early diagnosis.

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### Introduction

Adolescence health is of prime importance because they undergo a transition from childhood to adulthood. These teen years are a period of intense growth, not only physically, but also mentally and socially. Anaemia is the most common nutritional deficiency disorder globally, affecting a quarter of the world population, especially children and women of reproductive age group, resulting in public health problem of paramount importance[1] Anaemia is a widespread nutritional problem which is more commonly seen in women and children affecting their most crucial periods like during pregnancy and growth respectively[2,3] Globally, prevalence of anaemia among adolescents is 15%[4] In developing countries, like India, prevalence of anaemia is three to four times more as compared to developed countries[5-7] Majority of anaemia cases are caused due to nutritional problems and invariably a common accompanying feature of almost all cases of severe acute malnutrition (SAM). Anaemia is the most common hematologic disease of the pediatric age group and is the most widespread nutritional problem in the world and has predominance in developing countries like India, particularly in children and women. In India, children have high prevalence of anaemia varying from 27% to 90% has been reported in different studies[8]. The causes of anaemia may be categorized depending on red cell morphology or size (cytometric or morphologic classification), the underlying pathophysiological mechanism (aetiologic or erythrokinetic or biologic classification), marrow responsiveness or based on its biochemical or molecular basis[9] The studies on prevalence of anaemia have been done on preschoolers only, so there is a need for more studies related to anaemia in school going children. The continuation of limited iron

stores at birth, timing of umbilical cord clamping, type of supplementary food introduction and frequency of infections account for high prevalence of iron deficiency in India. The prevalence of anaemia is an important health indicator and when it is evaluated with other ancillary investigations like iron status, haemoglobin concentration can provide information about the severity of iron deficiency

### AIM:

Aim of the study was to determine the clinico-hematological profile in children of adolescent age group at Narayan Medical College and Hospital, Jamuhar, Sasaram, Bihar.

### Materials and methods

A retrospective study was done in the Department of Pathology at Narayan Medical College, Jamuhar, Sasaram, Bihar from January 2023 to June 2023.

A total of 250 patients between 10 years to 19 years presenting with anaemia according to WHO criteria and thorough history and clinical examination as per the proforma.

Complete haemogram evaluation was analyzed with Erba-360 analyzer (5 part). Leishman stain, May Grunwald Giemsa were used for peripheral smear.

Other ancillary tests including stool and urine examination were done whenever required.

Inclusion criteria:

➤ All patients aged 10 years to 19 years.

Exclusion criteria:

➤ Children less than 10 years and more than 19 years of age.

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## Results

**Table 1: Gender distribution**

Gender	No. of children	%	P value
Males	120	48	< 0.005
Females	130	52	
Total	250	100	

Among 250 cases 120 were males (48%) & 130 were females (52%) with female preponderance and found prevalence of < 0.005 which was statistically significant.

**Table 2: Analysis of Clinical signs & symptoms.**

Clinical signs & symptoms	No of cases	%
Pallor	150	60
Weakness & fatigability	100	40

The most common presenting symptom was weakness and fatigability in 100 cases (40%) & pallor was the commonest sign on examination which was found in 150 cases (60%).

**Table 3: Grading of anaemia as per WHO criteria.**

Grading of anaemia	Number of children	%
Mild anaemia (>10 gm/dl)- Grade 1	130	52
Moderate anaemia (7-10 gm/dl)- Grade 2	98	39.2
Severe anaemia (<7 gm/dl)- Grade 3	22	8.8
Total	250	100

About 130 cases (52%) had mild anaemia, 98 cases (39.2%) had moderate anaemia & severe anaemia were 22 (8.8%) respectively. Majority were belonging to mild anaemia.

**Table 4: Morphological types of anaemia**

Type of Anaemia in study group	Number of children	%	P value
Microcytic hypochromic anaemia	160	64	<0.005
Normocytic hypochromic anaemia	85	36	
Dimorphic anaemia	5	2	
Normocytic normochromic blood Picture	12	2.4	
Hemolytic anaemia (Sickle cell/Thalassemia)	1	0.2	
Total	250	100	

The most common morphological type of anaemia was Microcytic hypochromic anaemia ie 160 cases (64%) followed by Normocytic hypochromic anaemia 90 cases (36%) and Dimorphic anaemia accounting for 5 cases (2%).

## Discussion

Anaemia is defined as a reduction of the total circulating red cell mass below normal limits. Functionally, it is defined as the decrease in the oxygen-carrying capacity of the blood, which leads to tissue hypoxia. Among the various types of anaemia, Iron deficiency anaemia is most common and is due to nutritional deficiency and is a major public health problem in children and adolescent age group. As the frequency of anaemia is more in adolescent age group and majority are due to treatable and preventable causes, hence we took this study to determine the clinico- hematological profile of anaemia and associated factors in children at our tertiary care centre.. Hence appropriate screening and subsequent early diagnosis and prevention will help in effective timely management of different types of anaemia. 250 patients with anaemia between the age group of 10 years to 19 years have been studied during the period of January 2023 – June 2023 with female preponderance. The prevalence of anaemia in regard to gender with age showed statistical significance of  $p < 0.005$ . In our study it was found that 130 (52%) cases were mild anemic (Grade I), 98 were moderately anemic and 22 were mildly anemic respectively. Out of 250 cases, the most common morphological type of anaemia was Microcytic hypochromic

anaemia i.e. 160 (64%) followed by Normocytic hypochromic anaemia 85 (36%), Dimorphic anaemia 5 (2%). Microcytic hypochromic anaemia was also found in other series[[10-12] Dimorphic anaemia(9.09%) and Normocytic normochromic anaemia(9.09%) were seen in a study done by Ramana Sastry et al[13]

## Conclusion

➤Nutritional deficiency anaemia is the most common cause of anaemia among children aged 10-19 years & majority had mild to moderate anaemia, which was found predominantly in females.

➤Complete blood count and Peripheral smear examination plays a major role in diagnosis and further subtyping of anaemia which will guide for further ancillary studies and management.

➤Our study recommends that high prevalence of mild & moderate anaemia especially in females demands emphasis to bring down anaemia in adolescents

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