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ORIGINAL ARTICLE

STUDY OF ANAEMIA IN HOSPITALIZED PEDIATRIC PATIENTS: A 3 YEAR STUDY AT TERTIARY CARE CENTRE, GWALIOR

DR. RICHA PATHAK[1], DR. SUNITA RAI[2], DR. RAHUL[3]

[1]JUNIOR RESIDENT, DEPARTMENT OF PATHOLOGY, G.R.M.C, GWALIOR
[2]ASSOCIATE PROFESSOR , DEPARTMENT OF PATHOLOGY, G.R.M.C, GWALIOR
[3]JUNIOR RESIDENT, DEPARTMENT OF MEDICINE , G.R.M.C. GWALIOR
CORRESPONDING AUTHOR: DR SUDHA IYENGAR, HEAD OF DEPARTMENT, DEPARTMENT OF PATHOLOGY, GRMC, GWALIOR

ABSTRACT

BACKGROUND : Anemia is a serious global public health problem that particularly affects young children, menstruating adolescent girls and women, and pregnant and postpartum women. Several factors contribute to the occurrence of anemia and nearly half of (43%) the anemia cases in childhood are due to iron deficiency. Anemia during childhood adversely affects mental, physical and social development of the children in short- and long-term outcome.

MATERIAL AND METHOD: This cross-sectional study was conducted in the department of pathology, G.R. Medical College and Jayarogya group of hospital, Gwalior M.P. Anemia was diagnosed in chidren under 16 years of age by estimating the haemoglobin concentration in the blood with the use of an auto-analyzer. WHO Haemoglobin levels reference was used to classify the anemia accordingly.

RESULT: This study comprised 853 cases, out of which 455 (53.3%) cases were male and 398 (46.6%) cases were females. Most common age group affected was 6months-5 years of age group with maximum 348 (40.7%) cases. Most common morphological type was microcytic hypochromic anaemia.

KEYWORDS: Anaemia, Pediatric age group, Hemoglobin

INTRODUCTION

Anemia can be defined as a reduction in hemoglobin (Hb) concentration, hematocrit, or a number of red blood cells per litter below the reference interval for healthy individuals of similar age, sex, and race, under similar environmental conditions[1].

Anemia is a serious global public health problem that particularly affects young children, menstruating adolescent girls and women, and pregnant and postpartum women. Globally it is estimated that 40% of all children aged 6–59 months, 37% of pregnant women and 30% of women 15–49 years of age are affected by anaemia.[2]

Several factors contribute to the occurrence of anemia and nearly half of (43%) the anemia cases in childhood are due to iron deficiency [3]. The deficiency may result from inadequate dietary intake of

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iron, malabsorption of iron, an increased iron demand during rapid growth in children and chronic blood loss.

Other causes of anemia include folate and vitamin B12 and A deficiencies, Malaria, intestinal helminths, viral infections, chronic disease, hemoglobinopathies, haemolysis, and bone marrow disorders [4-7]. Different studies also claimed that factors such as age, sex, residence, early initiation of complementary food, under-nutrition, maternal health status, maternal education, and poor socioeconomic status are significantly associated with anemia [8-10].

Anemia during childhood adversely affects mental, physical and social development of the children in short- and long-term outcome; it causes abnormalities of immune function, poor motor and cognitive development, poor school performance, and reduced work productivity in the life of the children, thereby decreasing earning potentials and negatively affect national economic growth.[11-14].

MATERIAL & METHOD

This is a cross-sectional study conducted in the department of pathology, G.R. Medical College and Jayarogya group of hospital, Gwalior M.P. It was a 36 months cross sectional study on 853 patients from a period of January 2020 to December 2023. The participants of the present study were the children under 16years of age, who were admitted in the pediatric ward with anemia during the study period. Anemia was diagnosed by estimating the haemoglobin concentration in the blood with the use of an auto-analyzer called Hemax. WHO Haemoglobin levels reference was used to classify the anemia accordingly. The children were grouped under different grades of anemia by adopting WHO guideline.

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Cases were selected according to the following inclusion and exclusion criteria.

Inclusion criteria:

• All the IPD patients having anemia in new born to eighteen years age group from paediatric ward during the study period of 36 months from January 2020 – December 2023 were included.

Exclusion criteria:

- All the paediatric patients in new born to eighteen years of age group without anemia.
- Children having acute blood loss, malignancy, bleeding disorder and chronic renal disease or any other chronic illness that directly contributes to anemia were excluded.

TABLE 1:WHO CRITERIA TO DEFINE ANEMIA FOR AGE GROUP ARE AS FOLLOWS.

Population	**Haemoglobin concentration (g/L)**

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Children, 6–23 months	<105
Children, 24–59 months	<110
Children, 5–11 years	<115
Children, 12–14 years, nonpregnant girls	<120
Children, 12–14 years, boys	<120
Adults, 15–65 years, nonpregnant women	<120
Adults, 15–65 years, men	<130

TABLE 2:WHO CRITERIA FOR DEFINING ANEMIA SEVERITY IN INDIVIDUALS.

Haemoglobin concentration (g/L)			
POPULATION	MILD	MODERATE	SEVERE
Children, 6–23 months	95–104	70–94	<70
Children, 24–59 months	100–109	70–99	<70
Children, 5–11 years	110–114	80–109	<80
Children, 12–14 years, (nonpregnant girls)	110–119	80–109	<80
Children, 12–14 years, boys	110–119	80–109	<80
Adults, 15–65 years, (nonpregnant women)	110–119	80–109	<80
Adults, 15–65 years, men	110–129	80–109	<80

RESULT

The hematological profiles of 853 children, ranging in age from one day to 18 years were analysed during the study period from January 2020-December 2023. This study comprised 853 cases, out of

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which 455 (53.3%) cases were male and 398 (46.6%) cases were females. Most common age group affected was 6months-5 years of age group with maximum 348 (40.7%) cases. This was followed by 11-17years of age group , which contributed 232 (27.2%) cases. The 5-10 years age group consisted of 195 (22.8%) cases, while the least affected group was infants below 6 months of age with 80 (9.3%) cases.

Severe anaemia (<70g/L) was seen more commonly in children having age 7 to 12years followed by the group having age 5 to 11 years, 6months to 23 months and 24 to 59 months.

Moderate anaemia (70-94g/L) was most commonly seen in age group 5 to 11 years followed by the group having age 24 to 59 months, 7 to 12 years and 6months to 23 months.

Mild anaemia (95-104g/L) was most common seen in age group 5 to 11 years old children followed by age group 24 months to 59 months,7 to 12 years and 6 months to 23 months.

TABLE 3: GENDER WISE DISTRIBUTION OF THE PATIENT.

GENDER	NO OF PATIENT	PERCENTAGE
MALE	455	53.3%
FEMALE	398	46.6%

FIGURE 1: GRAPHICAL REPRESENTATION OF GENDER WISE DISTRIBUTION

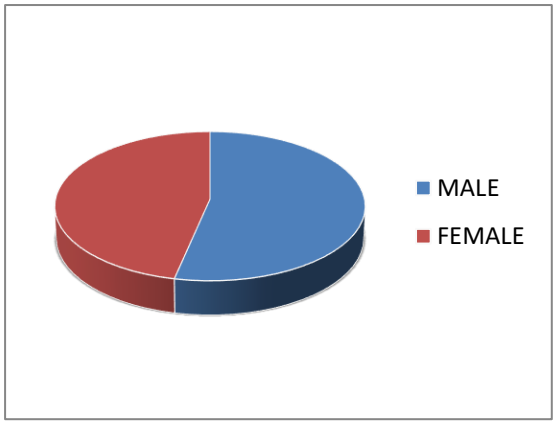

TABLE 4 : AGE WISE DISTRIBUTION OF THE PATIENT.

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AGE GROUP	NO OF PATIENT	PERCENTAGE
<=6 months	80	9.3%
>6 months -5 years	348	40.7%
5-10 years	195	22.8%
>10years	232	27.2%

FIGURE 2: CHART SHOWING AGE WISE DISTRIBUTION OF THE PATIENTS IN THE STUDY.

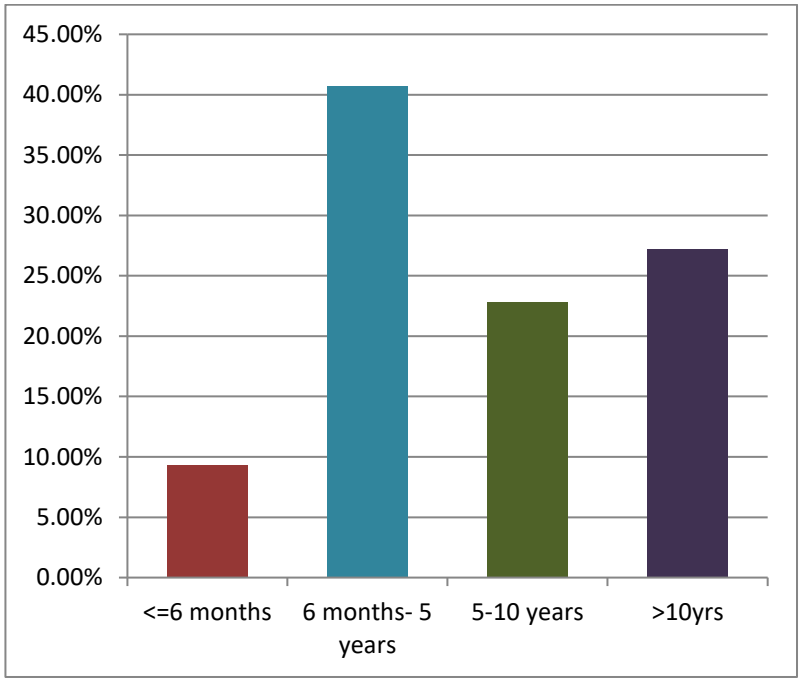

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TABLE 5: MORPHOLOGICAL DISTRIBUTION OF ANAEMIA.

MORPHOLOGICAL TYPE	NO OF PATIENT	PERCENTAGE
NORMOCYTIC NORMOCHROMIC ANEMIA	207	24.2%
MICROCYTIC HYPOCHROMIC ANEMIA	490	57.4%
MACROCYTIC ANEMIA	45	5.2%
DIMORPHIC ANEMIA	107	12.5%

FIGURE 3: CHART DEPICTING MORPHOLOGICAL DISTRIBUTION OF ANAEMIA.

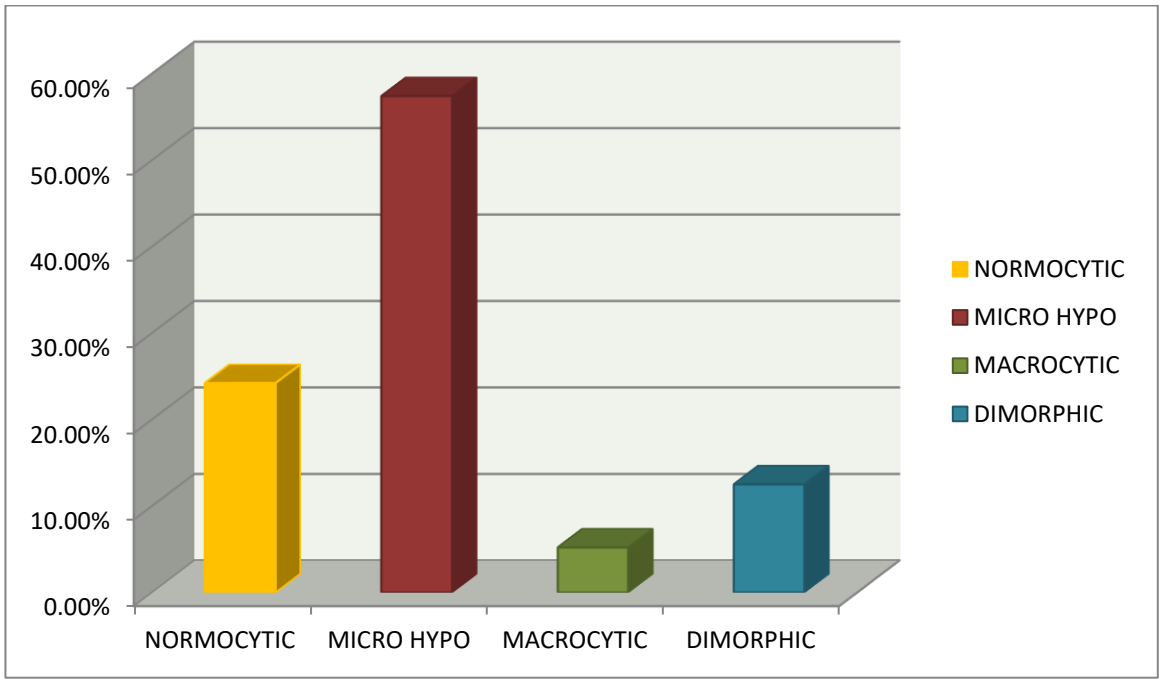

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TABLE 6 : DISTRIBUTION OF ANEMIA SEVERITY ACROSS DIFFERENT AGE GROUPS IN THE STUDY POPULATION.

AGE GROUP	NO OF PATIENT	MILD ANAEMIA (95-104g/L)	MODERATE ANAEMIA (70-94g/L)	SEVERE ANAEMIA (<70g/L)
6-23 months	144	25	56	63
24-59 months	185	37	91	57
5-11 years	236	55	96	85
12-17years	186	34	65	87

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DISCUSSION

Present study constituted 853 cases of anemia out of which 455 (53.3%) cases were males and 398 (46.6%) cases were females. Male: Female ratio was 1.14:1. These results were in accordance with Sunil Gomber et al [15], Abhishek Janjale et al[16], Jasima et al[17] who reported Male: Female ratio as 1.15:1, 1.45:1 & 1.7:1 respectively.

The study done by Jasima et al[17] reported maximum no of cases (34%) in 1-5 years age group, while in our study maximum number of cases 348 cases (40.7%)were in 6months -5 years of age group.

Moderate degree of anaemia (70-94g/L) was most commonly seen in the present study with 308 cases (36.1%). Similar observations were reported by Sharda Sidhu et al[18].

In the present study Microcytic Hypochromic (57.4%) was the most common morphological type followed by Normocytic Normochromic (24.2%) anemia. Similar observations were made by Abhishek Janjale et al [16], Prashant Marken et al[19].

Abhishek Janjale et al[16] reported 47.76% cases of Microcytic Hypochromic anemia followed by 28.81% cases of Normocytic Normochromic anemia. Prashant Marken et al[19] reported 47.2% cases of Microcytic Hypochromic anemia followed by 36.0% cases of Normocytic Normochromic anemia.

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CONCLUSION

In conclusion, this study highlights the substantial burden of anemia among children, particularly in younger age groups. Efforts to reduce pediatric anemia should focus on improving nutrition, particularly high risk populations such as those in rural areas and low socio-economic settings.

CONFLICT OF INTEREST : There were no conflict of interest

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