Hospital Based Cross Sectional Study to Determine the Clinical and Demographic Profile of the Children Diagnosed with Nutritional Anaemia

Upendra Prasad Sahu[1], Bhuwan Kumar Singh[2]

[1]Associate Professor, Department of Pediatrics, RIMS, Ranchi, Jharkhand, India

[2]Senior Resident, Department of Pediatrics, RIMS, Ranchi, Jharkhand, India

Abstract

Background: In recent 10 years, with the rapid socioeconomic development and the extensive implementation of children nutrition improvement projects, the previous epidemiological data cannot reflect the actual level of anemia among children.

Methodology: A cross sectional study was undertaken in children with nutritional anemia attending Department of Pediatrics RIMS, Ranchi, Jharkhand, India from October 2020 to September2021.

Results: Out of the 210 children studied, 115 children belonged to the age group of 6 year to 18-year group. Majority was males and accounted for 121 of the subjects with females accounting for 89. Majority (73 cases) belonged to class IV (upper lower), with 48 cases belonging to class III (lower middle) socio-economic status according to modified kuppuswamy classification. Majority were vegetarians constituting 127 cases and the rest 83cases belong to non-vegetarians.

Conclusion: This study has revealed that the prevalence of anemia in children is high and a severe public health problem in the study area. Therefore, the policymakers should make a strategy that can reduce poverty and increase the awareness of nutrition, and other associated factors to reduce anemia.

Keywords: Anemia, Children, Risk Factors

Introduction

Anemia is defined as a child is said to be anaemic when the Hb &/or Hct is 2SD below the mean for that age and sex. Childhood anemia is a public health problem worldwide. Data from World Health Organization (WHO) showed that the anemia prevalence among children aged 6–59 months was 42.6% globally in 2011 and maximized in Africa (62.3%) and Southeast Asia (53.8%) [1].

The anemia prevalence of children under 5 years old in China was 12.6% and differed geographically, as it was higher in rural areas (13.3%) than in urban areas (10.3%) [2]. The causes of anemia are multifactorial, including the shortage of

hematopoietic materials (e.g., iron, folic acid, vitamin B12), infectious diseases (e.g., malaria) and inherited hemoglobin diseases [3]. Iron deficiency is a common cause of anemia in children and is associated with 86-93% of anemia in children [4]. Many observational studies indicate that the independent risk factors of anemia in children include preterm birth, low birth weight, and maternal anemia [5-9].

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. [10-13]

A variety of behavioral disturbances have been observed in iron-deficient children. They include irritable and disruptive behaviors have short attention spans and lack of interest in their surroundings.

Neurological development in infants and scholastic performance in older children are impaired. An attention deficit was the fundamental abnormality in most. Epithelial tissue changes Iron-deficient patients are characterized by defective structure or function of epithelial tissue. Especially affected are the nails, tongue, mouth and stomach.[14]

Fingernails may become brittle, fragile or longitudinally ridged. More typical are thinning, flattening and finally spoon shaped nails. Peripheral smear blood picture shows anisocytes and poikilocytes apart from microcytic and hypochromic red cells. Anisopoikilocytosis is an important early sign in iron deficiency. Presence of hypochromic red cells in peripheral smear is a good indicator of iron deficiency, but few other conditions, which give rise to a hypochromic microcytic picture needs to be differentiated from iron deficiency, like anemia of chronic diseases, thalassemia, sideroblastic anemia and lead poisoning [15].

Mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) are reduced whereas mean corpuscular hemoglobin concentration (MCHC) is reduced in long standing or severe anaemia. The MCV (75-95fl), MCHC (30-36gm/dl), MCH (29-34pg), and RDW is 11.5% to 14.5%. The degree of change in the red cell indices is related in part to the duration and in part to the severity of anemia.

Materials and Methods:

The present cross sectional study was conducted in children diagnosed with nutritional anemia attended department of Pediatrics RIMS, Ranchi, Jharkhand,India from October 2020 to September 2021.

Inclusion criteria:

• Children 6-14 years age
• Nutritional anaemia

Exclusion criteria:

• Children with congenital disease

Table 1: Age and sex wise distribution of cases

Age group	Male	Female	Total
6 month – 6 years	41	33	74
6 year – 14 years	67	48	115
14-year -18 year	13	8	21
Total	121	89	210

Out of the 210 children studied, 115 children belonged to the age group of 6 year to 14 year and 74 children belong to 6 months to 6-year age group and 21 children belongs to 14 years to

18 year age group. Out of the 210 children studied, majority was males and accounted for 121 of the subjects with females accounting for 89.

Table 2: Socio economic status wise distribution of cases

Socio-Economic status	Number of Cases
Class I	20
Class II	31
Class III	48
Class IV	73
Class V	38
Total	210

Out of 210 children studied, majority (73 cases) belonged to class IV (upper lower), with 548cases belonging to class III (lower middle) socio-economic status according to Modified Kuppuswamy classification.

Table 3: Dietary Habits wise distribution of cases

Dietary habit	Number of cases
Vegetarian	127
Non-vegetarian	83
Total	210

Majority was vegetarian constituting 127 cases, and the rest 83 cases belong to non-vegetarians.

Table 4: Clinical manifestations

Symptoms	Number of cases
Pallor	125
Bald tongue	18
Platynchia	57
Murmur	10

Out of 210 cases, pallor was the predominant clinical manifestation followed by platynchia.

Table 5: Classification of Anemia

Type of Anaemia	Number of cases
Mild anaemia	24
Moderate anaemia	52
Severe anaemia	30
Normal	104

Out of 210 children studied, 24 cases had mild Anemia (Hb- 10-12 gm/dl) and 52 cases had moderate anaemia (Hb- 7-10 gm/dl) and 30 cases had severe anaemia (Hb <7gm).

Discussion:

The finding of this study showed that the overall anemia prevalence among children aged 6–71 months in rural Hunan Province was 8.8%, which was significantly lower than the preschool children in Africa (50.4–70.9%) or Latin America and Caribbean (32.9%) [17, 18, 19], but was slightly higher than the children aged 6–59 months in America in 2016 (8.6%) [20].

In our study, out of the 210 children studied, 115 children belonged to the age group of 6 year to 14-year group. Majority was males and accounted for 121 of the subjects with females accounting for 89. Majority (73 cases) belonged to class IV

(upper lower), with 48 cases belonging to class III (lower middle) socio-economic status according to modified kuppuswamy classification. Majority were vegetarians constituting 127 cases and the rest 83 cases belong to non-vegetarians

A pre-planned questionnaire was used to collect the health details of the children. The children were grouped according to age. Prevalence of anaemia as per the World Health Organization recommended cut off value of haemoglobin, among these children was 52.88%. The frequency of the prevalence of anaemia was significantly higher amongst girls as compared to boys. Results of the study population reveal that 52.88% were anemic, girls (67.77%) were 32.2% higher than the boys (35.55%) and anemic children were underweight [21].

High family income was also identified as a protective factor for childhood anemia, which was supported by previous studies [22].

Studies done prior to 1985, in India, gave an average prevalence rate of 68% in pre-school children. The prevalence in different studies varied from 48 to 95%, placing all the states of India under the high magnitude category. However, this data is for children under five years of age and a specific age group of children under two years is not studied separately, where the prevalence is expected to be higher. Based on studies by the National Nutrition Monitoring Bureau, anaemia prevalence among children one to five years of age is around 66%, with a wide range of 33 to 93% across different states. Kotecha and Kotecha studied anemia prevalence in children under three years of age in Vadodara urban slum and found anemia prevalence to be as high as 91% [22-25].

Conclusion:

This study has revealed that the prevalence of anemia in children is high and a severe public health problem in the study area. Therefore, the policymakers should make a

strategy that can reduce poverty and increase the awareness of nutrition, and other associated factors to reduce anemia.

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