



STUDY OF INCIDENCE OF IRON DEFICIENCY ANEMIA IN CHILDREN'S AGED 1-5 YEARS ADMITTED IN HOSPITAL

Ramamoorthy R^{1*}, Balachandar C S², Chidambaranathan S³ and Nisha⁴

Department of Pediatrics, Rajah Muthiah Medical College, Chidambaram - Tamil Nadu

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ABSTRACT

Introduction: Anemia in children is an important health problem in almost all the developing countries of the world with an estimated prevalence of 43 %. Iron deficiency (ID) is still a common nutritional deficiency in developing countries responsible for more than 50% of total anemia cases in children under 5.

Methodology: 100 children between the age of 12 months to 5 years, who were admitted (In patients) to the department of pediatrics, were selected and screened for anemia by hemoglobin estimation. On admission, a detailed history of the patient was recorded; a thorough physical examination was carried out and complete blood count with smear study was done to establish the morphology.

Results: In the present study incidence of anemia was more in 12 – 24 months (34%), male cases dominated the incidence of anemia. 88% of children admitted with anemia, presented with complaint of either GI (diarrhea& vomiting) or fever, 58% were in the moderate anemia and out of 100 children 53 (53 %) of children had microcytic blood picture.

Conclusion: Microcytic hypochromic picture was common among rural population

Limitations: In the above study the number of children was limited and other red cell indices was not evaluated.

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INTRODUCTION

Anemia in children is an important health problem in almost all the developing countries of the world with an estimated prevalence of 43 %. Anemia has a variable impact on physical development and children show poor attentiveness, memory and academic performance. Majority of anemia cases are nutritional and invariably a common accompanying feature of almost all cases of protein energy malnutrition. Iron deficiency (ID) is still a common nutritional deficiency in developing countries responsible for more than 50% of total anemia cases in children under 5. Anemia is associated with socioeconomic, biological, environmental and nutritional factors. In India, population-based information is available on anemia in under 5-year-old children; however, data on this problem and associated factors in hospitalized

children are scarce. Thus, this study aimed to estimate the incidence of iron deficiency anemia in children's in age 1-5 years admitted to hospital in a rural population.

METHODS AND MATERIALS

The present study was conducted in Rajah Muthiah Medical College and Hospital, Chidambaram, which is a 1200 bedded tertiary care centre serving the rural population. It's a hospital based cross sectional study with 100 children between the age of 12 months to 5 years, who were admitted (In patients) to the department of pediatrics, were selected and screened for anemia by hemoglobin estimation. This study was carried out from October 2014 to June 2015. Among those children with hemoglobin < 11 g/dl, were screened for iron deficiency anemia (Smear study). **INCLUSION CRITERIA:** Children in the age

*Corresponding author: Ramamoorthy, R

Department of Pediatrics, Rajah Muthiah Medical College, Chidambaram - Tamil Nadu - Tamil Nadu

group of 12 months to 1-5 years, those children with hemoglobin level less than 11gm/dl and clinical evidence of pallor. EXCLUSION CRITERIA: Children aged <1 year and >5 year, who had blood transfusion in past 3 months, child on iron supplementation, cyanotic congenital heart diseases, Blood cell malignancy and hemolytic anemia were excluded. On admission, a detailed history of the patient was recorded; a through physical examination was carried out and complete blood count with smear study was done to establish the morphology.

RESULTS

The present study was carried out in RMMCH, Chidambaram, which is 1200, bedded tertiary care hospital serving the rural population. The present study was done to identify the incidence of iron deficiency anemia in children admitted in RMMCH with age between 1 to 5 years.

Table 1 Age wise distribution of the cases

Age in months	No. of cases
12-24	34
25-36	20
37-48	24
49-60	22
Total	100

Table 2 Sex distribution of case with comparison of age:

Age in months	Sex		Total
	Female	Male	
12 -24	13	21	34
25-36	9	11	20
37-48	11	13	24
49-60	10	12	22
Total	43	57	100

Table 3 Age wise distribution of malnutrition according to iap classification

Age	Normal	IAP				To
		I	II	III	IV	
12-24 months	5	5	8	11	5	34
25-36 months	1	4	6	5	4	20
37-48 months	2	3	10	6	3	24
49-60 months	3	3	9	7	0	22
Total	11	1	33	29	12	10

Table 4 Symptom wise distribution of cases

Complaints	No. of patients	Percentage
GI symptoms [diarrhea, vomiting]	54	54.0
Loss of appetite	39	39.0
Fever	34	34.0
PICA	21	21.0
Breathlessness	20	20.0
Easy fatigue	14	14.0
Irritability	7	7.0

Table 5 Physical finding in relation with age

	Age				Total
	12-24 months	25-36 months	37-48 months	49-60 months	
Pallor	34	20	24	22	100
Murmur	8	2	4	4	18
Hepatomegaly	3	0	2	0	5
Splenomegaly	1	0	1	1	3

Table 6 Age wise distribution of Hb level with age

Age	Hb level			Total
	Severe anemia	Moderate anemia	Mild anemia	
12-24 mo	6	22	6	34
25-36 mo	3	14	3	20
37-48 mo	7	7	10	24
49-60 mo	4	15	3	22
Total	20	58	22	100

Hb with respect to severity of anemia

Severity	HB Level
Severe Anemia	6 ± 0.919
Moderate Anemia	8.33 ± 0.651
Mild Anemia	10.37 ± 0.300

Table 7 distribution of peripheral smear in relation with age

Age	MIC			Total
	MIC	MAC	DM	
12-24 months	22	7	5	34
25-36 months	11	4	5	20
37-48 months	9	10	5	24
49-60 months	11	4	7	22
Total	53	25	22	100

DISCUSSION

Anemia during infancy childhood is one of the commonest clinical condition responsible for varying degree of morbidity and early mortality. Iron deficiency is the commonest cause of anemia. It is also the commonest nutritional disorder in humans. The demand for erythropoietic factors increase during infancy & childhood because of rapid growth. This compiled with unbalanced nutritional status & excuse loss of blood in some cases contribute to high prevalence of anemia in this age group.

Age Distribution: In the present study the common age group presented with anemia was between 12 to 24 months (34%). similar study done by Jain *et al* [2] revealed a high prevalence of anemia in children 1 to 2 years of age (59.9%), study done by Ashokumar *et al* [3] observed maximum case of anemia are seen in the age group of 1 to 5 yrs. The study done by Arlappa *et al* [4] observed the prevalence of anemia was significantly higher among 1 to 3 years (76.5%), when compared to 4 to 5 years (53.6%).

Sex Distribution: In the present study anemia was common among males compared to female. The ratio being 1.3:1 in the present study. This coincide with the study of Firdossaba *et al* [1], who have reported a ratio of

1.4:1. Study conducted by Rosemaryferreira *et al* [5] also showed higher incidence of anemia in male children, study done by Ashokumar *et al*[3] also observed males outnumber females. The higher incidence of anemia in male children may be due to the prevailing custom of carrying more for the male child who were being brought to hospital for treatment more frequently.

Nutrition: In a study done by Amielenna *et al*[6], similar result was noted with significant association of anemia with protein energy malnutrition most belong to grade II,III,IV. In a study done by Ram K. Chandyo *et al*[7] have demonstrated a higher incidence of anemia in low weight for age children .

Presenting Symptoms: In the present study majority of children of children presented with symptoms not directly related to anemia. Our study observed majority of children presented with gastro intestinal disturbances (54%)[diarrhea& vomiting]. In the study done by Rosemary ferreria *et al* [5] observed 43.9% of children presented with gastro intestinal symptoms. Lima *et al* [8] reported a higher prevalence of anemia in infancy with diarrhea .

Physical Sign: In the present study, all children had clinical presents of pallor of mucosa which is the most important clinical evidence of anemia. In our study hemic murmur was observed in 18%. Similar study done by Sharma *et al* [9] observed 21.7%.

Haematological Investigation: Comparison of severity of anemia between present study and various other studies.

Degree of anemia	Present study	NFHS-2[10]	NFHS-3[11]	T. salu <i>et al</i> [12]
Mild anemia	22%	23%	26%	42.1%
Moderate anemia	59%	46%	49%	49.1%
Severe anemia	19%	5.3%	3%	8.8%

Moderate anemia is the most common type of anemia noted in our study and it is correlating with family health survey 2&3. But in the present study proportion of severe anemia is little higher than other types most probably due to the fact that this is a hospital based study where only anemic children were taken for the study.

Peripheral Smear Distribution: Peripheral smear examination is the simplest and more informative study to identify the type of anemia

Study	Microcytic Hypochromic
Our study	53%
N Dhar <i>et al</i> [14]	64.2%
Sanjay <i>et al</i> [15]	56.4%
Firdossaba <i>et al</i> [1]	49%
Venkatesh G <i>et al</i> [13]	54%
Rehema <i>et al</i> [16]	37%

Summary

1. In the present study of 100 children of RMMCH with wide range of symptoms with clinical evidence of pallor and HB less than 11g/dl in 1 to 5 years, the following observation were noted:

2. In the study out of 100 children 53 children are belong to Iron deficiency anemia
3. Common age group of incidence between 12 to 24 month
4. Male dominates with ratio of 1.4:1 [male: female]
5. Predominently the children admitted with anemia were in grade II, III, IV.
6. Common presentation was GI symptoms
7. Microcytic hypochromic picture was common among rural population

Limitations: In the above study the number of children was limited and other red cell indices was not evaluated.

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