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PREVALANCE, SEVERITY AND PATTERN OF ANEMIA AMONG CHILDREN IN A TERTIARY CARE HOSPITAL, PUDUCHERRY.

Pathology

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ABSTRACT

BACKGROUND In developing countries anemia remains a major health problem. Over 273 million children under – five, suffer from anemia worldwide. Anemia has cognitive and behavioural impact on children. Anemic children tend to have average or below average academic performance levels. The objective of the study is to analyse the prevalence, pattern and severity of anemia among children in a tertiary care hospital. **Methods** This was a retrospective, longitudinal cross sectional study conducted on all children who attended the centre for the first time at Sri Lakshmi Narayana Institute of Medical Science, Pondicherry from June 2018 to may2019. The sample were analysed for the complete blood count including Hemoglobin concentration and RBC indices (MCV,MCH, MCHC) by automated Horiba analyser and Leishman stained peripheral smear of the blood sample were done for assessing the pattern of anemia. **Results:** During the study period, a total of 206 children(<15years) attended the pediatric outpatient department. The incidence of anemia was found to be 60.1%. Prevalence of anemia is higher in the age group of 1-5 yrs. It was found that the prevalence of anemia was 57.25% among female children compared to 42.75% among male children. The most common grade of anemia was moderate grade followed by mild. Severe anemia was found in only 8.06% of the cases. Moderate anemia was more pronounced in males than females whereas mild and severe anemia was found to be more in females. **Conclusion:** The high prevalence of anemia (60.1%) indicates strict implementation of National Nutrition Anemia prophylaxis programme.

KEYWORDS

Anemia , haemoglobin, severity, patterns , WHO

Introduction

Anemia is a global public health problem affecting both developing and developed countries. It affects both sexes and all ages and more so in females. In developing countries anemia remains a major health problem (1). Over 273 million children under five, suffer from anemia worldwide (2). All over the world around 3.5 billion populations are estimated to be suffering from varying degrees of anemia (3). Prevalence of anemia in developed countries are significantly less compared to developing countries like India. As per World Health Organization the prevalence of anemia is only around 16% in Europe as compared to 64% in developing countries like Africa (4). The highest prevalence is in preschool children (47.4%) and the lowest is in men (12.7%) (5).Childhood anemia is a condition where a child has an insufficient hemoglobin (Hb) level to provide adequate oxygen to the body tissues. World Health Organization (WHO) defines anemia according to the hemoglobin threshold in different age group which is as follows (6).

Age	-	Hemoglobin threshold (gm/dl)
Children (0.5-4.9 yrs)	-	11.0
Children (5.0- 11.9 yrs)	-	11.5
Children (12-14.9 yrs)	-	12.0

Severity of anemia is classified according to WHO as follows:
Severe anemia : Hemoglobin <7.0 gm/dl
Moderate anemia : Hemoglobin 7.0- 8.9 gm/dl
Mild anemia : Hemoglobin 9.0- 10.9gm/dl

Anemia is of high concern because of its preventable and treatable nature. At the individual level, childhood anemia contributes to poor motor and cognitive development, poor school performance, as well as increased morbidity and mortality(7). The anemia is detrimental even before symptoms become apparent and hence it is essential to identify the risk factors for timely and effective management strategies. The most common cause of anemia in children is having an anemic mother. Anemia has numerous potential etiologies. The most common cause of anemia in young children is low consumption and absorption of iron-rich foods followed by acute blood loss and hereditary or acquired diseases. These conditions most often lead to iron deficiency anemia, which accounts for approximately half of all anemia cases globally, with under-five children and women being the most affected(8,9). More than 80% of the children in India the most common cause of anemia is iron deficiency anemia followed by megaloblastic anemia . Hence prevention is also simple and cost effective. But implementation of policies are not so easy due to vast population in India . Simple preventive measures like anemia screening of pregnant women and supplementation of iron and folic acid tablets during pregnancy, regular de-worming for children, health education on well balanced diets, supplementary nutrition programs can be done. Present study is an attempt to study the prevalence and types of anemia among children attending outpatient department of tertiary care hospital in and around Agaram village, Pondicherry.

MATERIALS AND METHODS

Study design: Cross sectional study
Sample size: 206 cases were included in the study
Study period: June 2018 to May 2019
Inclusion criteria : All children aged 1-15 years with anemia. Children were screened by history and clinical examination for pallor.

Exclusion criteria:
Children less than 1 year and more than 15 years
Prior iron therapy (parenteral or oral) and blood transfusion in the preceding 3 months.

METHODS: Children who were pale were investigated. 2 ml of blood was drawn by vene puncture for complete hemogram . The blood sample was analysed for Complete blood count including Hemoglobin concentration and RBC indices (MCV, MCH, MCHC) by automated Horiba analyser. Leishman stained peripheral smear of the blood sample were analysed for the pattern of anemia. WHO divides anemia into mild anemia (haemoglobin 10.9-9 g/dl), moderate anemia (haemoglobin 7-8.9 g/dl) and severe anemia (haemoglobin < 7 g/dL).

OBSERVATION

During the study period, a total of 206 children attended the pediatric outpatient department. The incidence of anemia was found to be high i.e. 60.1%(Table 1). Prevalence of anemia is higher in the age group of 1-5 yrs. As the age increases the incidence of anemia decreases (Table 2). The prevalence of anemia was 57.25% among female children

compared to 42.75% among male children(Table 3). The most common grade of anemia was moderate grade followed by mild . Severe anemia was found in only 8.06% of the cases. Moderate grade of anemia was more pronounced in males than females whereas females have shown more prevalence of mild as well as severe grade of anemia (Table 4). Pattern analysis and RBC indices (MCV, MCH, MCHC & RDW) revealed microcytic hypochromic anemia was the most common morphological type of anemia(59.6%) followed by normocytic normochromic and macrocytic anemia. Microcytic hypochromic anemia is most common in female children(56.33%) compared to male children(45.8%) (Table 5).

Table 1: Incidence of anemia among children

Anemia	Total number of cases	Percentage
Yes	124	60.1%
No	82	39.8%

Table 2: Age wise distribution of anemia

Age	No. Of cases	Percentage
1-5 yrs	48	38.7%
6-10 yrs	40	32.5%
11-15 yrs	36	29%

Table 3: Sex wise distribution of anemia

Sex	No. Of cases of anemia	Percentage
Male	53	42.75%
Female	71	57.25%
Total	124	100%

Table 4: Severity of anemia

Grade	No. of cases male	No . of cases female	Total
Mild	18(33.96%)	25 (35.2%)	43(34.67%)
Moderate	32 (60.37%)	39 (54.92%)	71(57.25%)
Severe	3 (5.66%)	7 (9.8%)	10(8.06%)

Table 5: Patterns of anemia in peripheral smear

Patterns	No. of cases Male	No. of case female	Total
Normocytic normochromic	27(50.94%)	28(39.43%)	46(37%)
Microcytic hypochromic	24(45.8%)	40(56.33%)	74(59.6%)
Macrocytic	2(3.7%)	3(4.2%)	4(3.22%`)

Discussion

It is estimated that 30% of the global population suffer from anemia and most of the affected live in developing countries(10). This study was undertaken to calculate the prevalence and to document the pattern of anemia in children aged 1-15 yrs . The incidence of anemia among children was found to be high (60.1%). The prevalence of anemia was higher in female children compared to male children. This may be due to negligence towards nutrition of the female child in the families. Among 206 cases included during the study period 57% had moderate anemia, 37% mild anemia, 8% had severe anemia. This percentage is comparable to study from PGI, Chandigarh which recorded mild, moderate and severe anemia in 14.3%, 71.4% and 14.3 % cases respectively. Mean age of children in this study is similar to the study done by Jain N et al (11). Pattern analysis and RBC indices (MCV, MCH, MCHC & RDW) revealed microcytic hypochromic anemia was the most common morphological type of anemia(59.6%) followed by normocytic normochromic(37%) and macrocytic anemia(3.2%). Females children have higher incidence of microcytic hypochromic anemia (56.33%) compared to male children(45.8%).

Jain N et al conducted study in 2010 regarding prevalence of anemia in school children aged 5-16 years from government school of Rishikesh, Uttaranchal, India and found anemia in 51.5% of cases. Most common blood picture was microcytic hypochromic and girl children were more anemic as compared to male children. This is similar to our present study .Prevalence of anemia in girls found to be 57.25% in our study which is similar to the study done by Jondhale JP et al (12)

CONCLUSION

From this study we concluded that anemia is a common problem in children as well as in adolescents. It not only affects the growth of the children, but also affects their learning capacity and cognitive behaviour. Malnourished children are more prone to develop anemia. From our study it is evident that anemia is more common in female children compared to male children and the most common pattern is microcytic hypochromic anemia. Hence, anemia in children must be prevented by food fortification with iron or as iron supplementation. Mass programs like deworming and vitamin A supplementation must be conducted on a regular basis. Health education should be given to adolescents regarding healthy food habits.

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