

Prevalence of Nutritional Deficiency Anemia in Pediatric Patients of Adilabad**K. Ananth Rao***

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Abstract: Nutritional deficiency anemias are one of the common problems in developing countries like India. Interior and tribal places like Adilabad district of Telangana state are supposed to have a higher prevalence of nutritional deficiency anemias, especially in children due to the predominantly tribal population. This study was undertaken to find the prevalence of nutritional deficiency anemias in pediatric in ward patients of Rajiv Gandhi Institute of Medical Sciences [RIMS] Adilabad. All the cases admitted in the pediatric wards from October 2017 to January 2018 were analyzed and blood samples were collected and sent to Pathology Lab and those with the anemia and type of anemia were recorded and treatment was done accordingly. Results: Total numbers of inpatients admitted in the pediatric ward during the period from Oct 2017 to Jan 2018 were 2055. Therefore the prevalence of nutritional deficiency anemia in the pediatric wards in Adilabad was 2.63%. Most of the cases of nutritional deficiency anemia were found in 1-2 year age group children 26 cases out of total 54 (48.15%). The next common age group having nutritional deficiencies anemia was 2-5 years age group accounting for 29.63% of the total cases. The average mean hemoglobin level in males was 7.7gm/dl and in female was 7.1gm/dl. Most of the children 53.71% had the Normocytic hypochromic type of anemia, followed by the Normocytic Normochromic in 35.19% of cases, 7.4% and 3.7% of the cases had microcytic hypochromic and macrocytic hypochromic anemia respectively. Conclusion: The prevalence of nutritional deficiency anemia in pediatric ward patients of RIMS Adilabad is 2.63%. Presence of anemia in children still continues to be a common problem in backward areas. An elaborate systemic evaluation of all children in the schools will accurately provide the real depth of the underlying problem. An adequate management strategy should involve comprehensive treatment of the existing cases as well as be addressing the deficiency of Iron as well as other micronutrients like vitamin B12 and folic acid in the population.

Keywords: Nutritional Anemias, Pediatric Patients, Adilabad.**INTRODUCTION**

Nutritional anemia was defined in a 1968 WHO technical report as “a condition in which the hemoglobin content of the blood is lower than normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency” [1]. The main nutrients involved in the synthesis of hemoglobin are iron, folic acid, and vitamin B₁₂. In public health terms, iron deficiency is by far the first cause of nutritional anemia worldwide. Folic acid deficiency is less widespread and is often observed with iron deficiency. Vitamin B₁₂ deficiency is far rarer [2]. Nutritional deficiency anemia is now a recognized problem around the world, especially in the developing countries. It is estimated that around 30% of the population of the world suffers from anemia and the prevalence of anemia in 6-12 years old children is around 36% around the world and 77% in the developing countries [3-6]. In earlier studies prevalence

of anemia was found to be ranging from 66.7 to 77% among 5-14-year-old urban and rural school children in India [5, 7]. The main causes of anemia in developing countries includes inadequate intake and poor absorption of iron, malaria, hookworm infestation, diarrhea, HIV/AIDS and other infections, genetic disorders (e.g., sickle cell and thalassemia). Anemia affects health, education, productivity and the major cause of burden on health care system. Large populations of people with nutritional deficiency anemias are due to iron deficiency it is also one of the most common nutritional disorder in the world. The most common reason for iron deficiency in infants and children is due to inadequate supply of iron in the diet. Children are prone to acquire nutritional deficiencies as their bodies are growing rapidly and a requirement is high. The overall effects of anemia on children are because of the developmental changes they are going through, particularly the brain which is the fastest

developing organ in infancy and early childhood. Studies have identified a direct relationship between iron deficiency and delays in cognitive and psychomotor development in early childhood [8-15]. Other studies have also pointed out that children over two years of age demonstrate reduced cognitive acquisition when compared to non-anemic children, although there is an evident improvement once treatment is started [16]. Some studies have shown that there is a delayed myelination especially of the auditory nervous system in anemia patients [9]. Keeping in mind the consequences of the nutritional deficiencies on the children we in the present study tried to evaluate the prevalence of nutritional deficiency anemias in children admitted to pediatric wards of RIMS hospital Adilabad.

MATERIALS AND METHODS

The study was conducted on the ward patients of Department of Pediatrics, Rajiv Gandhi Institute of Medical Sciences [RIMS] Adilabad from October 2017 to January 2018. Institutional Ethical committee permission was obtained for the study. A total of 2055 patients were admitted to the pediatric wards during the study period. The blood samples were collected from the peripheral vein in 5ml vacutainer and send to the Department of Pathology for examination. The Department of Pathology, RIMS Adilabad uses 5 part hematology cell counter (Sysmex xn 1000 Manufactured by Sysmex India Pvt. Ltd Mumbai) to obtain all the hematological parameters. Those samples identified as anemic a small drop of blood was used to prepare a peripheral smear and stained with Leishman's

stain and observed under oil immersion microscope to determine the type of anemia. Those with hemoglobin levels of < 11 gm/dl were defined as anemic, grading of anemia was done according to hemoglobin levels of 9 - 10.9 gm/dl were classified as mild anemic, those between 7-8.9 gm/dl were classified as moderate anemia and those with hemoglobin less than 7.0 gm/dl were classified as severely anemic. Morphological classification of anemias was done by evaluating MCH the mean corpuscular hemoglobin levels normally between 24.1–29.4 pg MCV of the cells; the MCV between (80-100 fl) were classified as normocytic, those with MCV < 80fl were classified as microcytic and most with MCV >100fl were classified as macrocytic. The Mean Corpuscular Hemoglobin concentration [MCHC] was calculated and the values of MCHC between 31-37% were taken as normochromic and those with values < 31% were taken as hypochromic and the results obtained were tabulated and analyzed.

RESULTS

Figure 1 shows the distribution of the nutritional deficiency anemia in children. 48.15% of male children were detected with anemia and 51.85% of the females were suffering from nutritional deficiency out of the total 54 cases during the study period. Total numbers of inpatients admitted in the pediatric ward during the period from Oct 2017 to Jan 2018 were 2055. Therefore the prevalence of nutritional deficiency anemia in the pediatric wards in Adilabad was 2.63%.

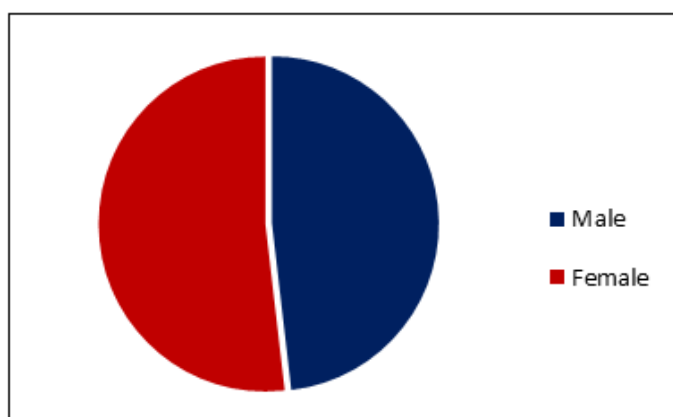


Fig-1: Distribution of nutritional anemia cases between male and female children

Most of the cases of nutritional deficiency anemia were found in 1-2 year age group children 26 cases out of total 54 (48.15%). The next common age group having nutritional deficiencies anemia was 2-5

years age group accounting for 29.63% of the total cases. In the 0-1 year age group children, 16.67% followed by 3.73% and 1.85% in the age group 5-10 and 10-13 respectively given in table 1.

Table 1: Age and sex wise distribution of the nutritional anemia cases

Age Group[yrs]	Male	Female	Total	Percentage(%)
0 – 1	6	3	9	16.67
1 – 2	8	18	26	48.15
2 – 5	10	6	16	29.63
5 – 10	2	0	2	3.73
10 – 13	0	1	1	1.85
Total	26	28	54	100

The anemias were classified based on the peripheral smear examinations and the cell counter reports. Most of the children 53.71% had the Normocytic hypochromic type of anemia, followed by

the Normocytic Normochromic in 35.19% of cases, 7.4% and 3.7% of the cases had microcytic hypochromic and macrocytic hypochromic anemia respectively given in table 2.

Table-2: Type of anemia based on peripheral blood smear examination

Type of Anemia	Male	Female	Total	percentage
Normocytic Normochromic	9	10	19	35.19
Normocytic Hypochromic	14	15	29	53.71
Microcytic Hypochromic	2	2	4	7.40
Macrocytic Hypochromic	1	1	2	3.70
Total	26	28	54	100

Grading of anemias was done based on the levels of hemoglobin. It was found that 40.74% has severe anemia the hemoglobin levels were found to be less than 7gm/dl. 38.89% had mild anemia the hemoglobin levels were between 9-10.9 gm/dl and

moderate anemia was found in 30.37% the hemoglobin levels were between 7-8.9 gm/dl given in table 3. The average mean hemoglobin level in males was 7.7gm/dl \pm 1.80 and in female was 7.1gm/dl \pm 1.76.

Table-3: showing the grades of anemia in male and female children

Grade of Anemia	Male	Female	Total	percentage
Mild	11	10	21	38.89
Moderate	8	3	11	20.37
Severe	7	15	22	40.74
Total	26	28	54	100

DISCUSSION

The prevalence of nutritional anemia in pediatric ward patients was found to be 2.63%. In a similar study done in the past in RIMS, Adilabad in pediatric patients by Swapnatai AM *et al.* had found 54 cases of nutritional deficiency in a period of 3 months from May 2011 to July 2011 [17]. In the present study also we found 54 anemic patients out the total 2055 patients during the period from October 2017 to January 2018 admitted to the pediatric wards. Comparing the average hemoglobin levels found in the previous study the average hemoglobin levels in male reported were 2.34 \pm 1.06 and in female to be equal to 5.8 \pm 1.39 [17]. In the present study the average hemoglobin levels in male were 7.7gm/dl \pm 1.80 and in the female, it was found to be 7.1gm/dl \pm 1.76. This indicates there is a slight improvement in the anemic conditions in the children of Adilabad however they still have lower hemoglobin levels and the conditions need to improve. The study also highlights that the problem of anemia has to be dealt with in this group of the population with low socioeconomic status. Although in this study we did not study in detail the dietary habits it is highly likely that the individuals are taking nutritionally

deficient diets and may be susceptible to parasitic infestations. In one study on 3633 preschool children in rural areas of Kerala state, the frequency of anemia was 9.3% in veg eating population and 12.1% in non-veg [18] Demaeyer *et al.* reported the prevalence of anemia in 6-12 year old children to be 86% [4] and Verma M *et al.* in Punjab recorded 77% prevalence of anemia [5]. The prevalence of anemia was found to be highest in Varanasi at 93% [19]. The variations in results of the present study and other similar studies may be due to heterogeneity of the population, dietary habits, nutritional status and incidence of parasitic infestations among the population. In this regard, the ministry of health and family welfare Govt. of India has started a single day deworming program across the country from Feb 2016. The national deworming day will be observed across the country on 10 February and 10 August each year and all the children 1-19 yrs will be administered chewable Albendazole tablets in schools, colleges and Anganwadi centers across India. Such efforts may have reduced the incidences of worm infestations. In the end, we can say that the scenario of nutritional anemia in Tribal Adilabad has improved when compared to the past study however still there is a

further scope of further improvements to reduce the burden of anemia and its consequences on tribal population.

CONCLUSION

The prevalence of nutritional deficiency anemia in pediatric ward patients of RIMS Adilabad is 2.63%. Presence of anemia in children still continues to be a common problem in backward areas. An elaborate systemic evaluation of all children in the schools will accurately provide the real depth of the underlying problem. An adequate management strategy should involve comprehensive treatment of the existing cases as well as be addressing the deficiency of Iron as well as other micronutrients like vitamin B12 and folic acid in the population.

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