DOI: 10.14260/jemds/2015/860

ORIGINAL ARTICLE

PREVALENCE OF ANEMIA IN PEDIATRIC AGE GROUP PATIENTS AND ITS CO-RELATION WITH SOCIO-DEMOGRAPHIC FACTORS IN PATIENTS PRESENTING AT DEPARTMENT OF PEDIATRICS AT ROHILKHAND MEDICAL COLLEGE AND HOSPITAL, BAREILLLY, U. P.

Tania Oberoi[1], Ajay Pratap[2]

HOW TO CITE THIS ARTICLE:
Tania Oberoi, Ajay Pratap. "Prevalence of Anemia in Pediatric Age Group Patients and its Co-relation with Socio-demographic Factors in Patients Presenting at Department of Pediatrics at Rohilkhand Medical College and Hospital, Bareillly, U. P". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 34, April 27; Page: 5877-5882, DOI: 10.14260/jemds/2015/860

ABSTRACT: BACKGROUND: About 2 billion people are suffering from iron deficiency anemia. India continues to be one of the countries to have highest prevalence of anemia NFHS 3 estimates reveals the prevalence of anemia to be 73% in children aged 5-11 years. Present study was undertaken to determine the prevalence of anemia in pediatric age group from 6 months to 14 years. Aims and objective: To study prevalence of anemia in pediatric age group patients and its co-relation with socio-demographic factors in patients presenting at pediatrics department R.M.C.H. Bareilly. **MATERIAL METHODS:** Cross sectional study was carried out from July 2013 to December 2014. A total of 215 students (115 boys and 100 girls) were studied. Parents of subjects aged less than 8 years and patients aged more than 8 years attendants were interviewed using a pretested questionnaire. Blood samples were taken by fingers prick method. Hb estimation was done by cyan-met hemoglobin method using calorimeter. SPSS Version 10.0, proportions were calculated and chi square test was used as a test for significance. **RESULTS:** Out of total 215 subjects, 82 (38%) were found anemic. Girls were affected more as comp aired to boys. Prevalence of anemia was maximum in children belonging to lower social classes (100.0%) followed by upper-lower (45%), lower middle (26%) and upper middle (22%) and this prevalence of anemia in relation to social class was found to be statistically significant ($p<0.001$) higher in children of illiterate mothers and working mothers ($p<0.001$). **CONCLUSION:** In India major factor responsible for nutritional anemia children is delayed weaning and insufficient semisolid and solid food intake.

KEYWORDS: Anemia, correlation of socio-demographic factors, prevalence.

INTRODUCTION: Anemia is a global problem of serious public health concern. With a global population of 6.7 billion, about 3.6 billion people have iron deficiency and out of these about 2 billion are suffering from iron deficiency anaemia.[1] India continues to be one of the country to have highest prevalence of anemia because of low dietary intake, poor availability of iron and chronic blood loss due to hookworm infestation and malaria. Anemia is a serious concern for young children as it can adversely affect cognitive performance, behavioral and motor development, coordination and language development and scholastic achievement as well as increased morbidity from infectious diseases. National Family Health Survey 3 (NFHS 3) estimates reveal the prevalence of anemia to be 73% in children aged (5-11) years.[2]

Anemia is one of the most common hematological abnormalities found in children. It can be defined as the reduction in oxygen-carrying capacity or as a reduction in the red cell mass of the body. Among the various types of nutritional anemia, iron-deficiency anemia is the most common, affecting more than two billion people globally.

DOI: 10.14260/jemds/2015/860

Hemoglobin levels to diagnose anemia at sea level (g/l).[3]

Classification of Anemia by Cause[4]	
Mechanism	Examples
Blood loss	
Acute	GI bleeding Injuries Childbirth Surgery
Chronic	Bladder tumors Cancer or polyps in GI tract Heavy menstrual bleeding Kidney tumors Ulcers in the stomach or small intestine
Deficient erythropoiesis*	
Microcytic	Iron deficiency Iron-transport deficiency Iron utilization defect Iron reutilization defect Thalassemias (also classified under excessive hemolysis due to intrinsic RBC defects)
Normochromic-normocytic	Aplastic anemia Hypoproliferation In kidney disease In endocrine failure (thyroid, pituitary) In protein depletion Myelodysplasia Myelophthisis
Macrocytic	Copper deficiency Folate deficiency Vitamin B_{12} deficiency Vitamin C deficiency
Excessive hemolysis due to extrinsic RBC defects	
Reticuloendothelial hyperactivity with splenomegaly	Hypersplenism
Immunologic abnormalities	Autoimmune hemolysis Cold antibody hemolysis (paroxysmal cold hemoglobinuria) Warm antibody hemolysis Isoimmune (isoagglutinin) hemolysis
Mechanical injury	Infection Trauma
Excessive hemolysis due to intrinsic RBC defects	
Membrane alterations, acquired	Hypophosphatemia Paroxysmal nocturnal hemoglobinuria Stomatocytosis

DOI: 10.14260/jemds/2015/860

Membrane alterations, congenital	Hereditary elliptocytosis Hereditary spherocytosis
Metabolic disorders (inherited enzyme deficiencies)	Embden-Meyerhof pathway defects G6PD deficiency
Hemoglobinopathies	Hb C disease Hb E disease Hb S-C disease Hb S–β-thalassemia disease Sickle cell disease (Hb S) Thalassemias (β, β-δ, and α)

With 40% prevalence of nutritional anemia in the world on an average for the general population, the prevalence in the developing countries tends to be three to four times higher than in the developed countries. The present study was undertaken to determine the prevalence of anemia in pediatric age group patients from 6 months upto 14 years.

AIMS AND OBJECTIVES: To study the prevalence of anemia in pediatric age group patients and its co-relation with socio-demographic factors in patients presenting in OPD/IPD clinic at Department of Pediatrics at Rohilkhand Medical College and Hospital, Bareillly.

MATERIAL AND METHODS: A cross-sectional study was carried out from July 2013 to December 2014 in both the rural and urban population of Bareilly presenting at the OPD/IPD clinic. The study subjects were within age group of 6 months upto14 years. A total of 215 students (115 boys and 100 girls) were studied. A prior consent was taken from the respective parents/attendees explaining the objective of the study. The patient's nutritional status was categorized as the IAP growth charts.

All the examinations were carried out in the pathology laboratory of the medical college.

After collection, the whole data was compiled; analyzed and appropriate statistical tests were applied. Anemia was further graded as mild, moderate and severe as per De Meyer EM. (1989)[5] Parents of subjects aged less than 8 years and patients aged more than 8 years attendants were interviewed using a pre tested questionnaire to elicit information regarding their socio-demographic profile. Both the Height and weight (nearest 1 cm and 0.5 kg respectively) was recorded for every student using standardized instruments. Blood samples were taken by finger prick method using sterilized needles by a trained lab attendant. Hemoglobin estimation was done by cyan-meth haemoglobin method using calorimeter.

The data was coded and transferred to a master chart in MS Excel. Statistical analysis was done by using the statistical software, SPSS Version 10.0, proportions were calculated and chi square test was used as a test for significance.

RESULTS:

Severity	**Hb concentration**
Mild	(10- cut off value)
Moderate	(7-10)
Severe	(< 7)

Table 1: Distribution of anemia in male subjects according to its severity.[5]

DOI: 10.14260/jemds/2015/860

Out of total 215 subjects, 82(38%) were found to be anemic. Girls (45%) were affected more as compared to boys (31%) as shown in table 2.

Anemia	Boys 115		Girls 100		Total 215	
	No.	Percent	No.	Percent	No.	Percent
Present	36	31 %	45	45	82	38
Absent	79	69 %	55	55	133	62
Total	**100**	**100**	**100**	**100**	**215**	**100**

Table 2: Anemia in boys and girls

$X^2 = 11.20$, p value < 0.005.

Table 3 shows the proportion of mild, moderate and severe anemia in children which was found to be 69%, 31% and nil respectively.

Grade gm/dl	Boys 115		Girls 100		Total 215		Prevalence %
	No.	percent	No.	percent	No.	percent	
Mild	79	69	71	71			26.2
Moderate	36	31	29	29			11.5
Severe	-	-	-	-	-	-	-
Total	**100**	**100**		**100**		**100**	**37.7**

Table 3: Severity and prevalence of Anemia in children

Table 4 shows that the prevalence of anemia was maximum in children belonging to lower social class (100.0%) followed by upper-lower (45%), lower-middle (26%) and upper-middle (22%) and this difference in prevalence of anemia in relation to social class was found to be statistically significant (p<0.001). Anemia cases were significantly higher (41.7%) in vegetarians as compared to non-vegetarians (32.9%). It was also observed that anemia was significantly (p<0.001) higher (52.7%) in children belonging to joint families as compared to those belonging to nuclear families (31.5%). Percentage of anemia was significantly (p<0.001) higher in children of illiterate mothers and working mothers (p< 0.001).

Sl. No.	Socio-demographic factor	Total (215)	Anemia		X^2
			Present	Percent	
1)	Social class				24.98, degree of freedom – 2 p value <0.005
	Upper	-	-		
	Upper-middle	19. 09%	4	22	
	Lower- middle	72.33%	19	26	
	Upper-lower	120. 56%	54	45	
	Lower	40.2%	4	100	
	Total	215	81	38	

Table 4: Socio-demographic factors affecting anemia

DOI: 10.14260/jemds/2015/860

DISCUSSION: In the our study, anemia was detected in 38% (31% boys and 45% girls) children which is more than that found by Sharma et al[6], Rao et al,[7] Panda et al,[8] Semwal et al,[9] Hassan et al[10] and Chandra et al[11] in their studies (20.5%, 3.5%, 26%, 28.4%, 24.8% and 25.5% respectively) In all these studies girls were found to be more anemic than boys which is again similar to the findings in our study. The proportion of mild, moderate and severe anemia in our study was found to be 69%, 31 % and nil respectively. Prevalence of anemia was found to be significantly more ($p<0.001$) in children belonging to lower class and these findings are similar to the findings of Sharma et al[12] who also observed higher prevalence of pallor (35.71%) in children belonging to social class IV as compared to children belonging to social class I (2.59%). Chandra et al[11] also found that nutrition related morbidity had a direct relationship with poor socio-economic status. The higher prevalence of anemia in children from low socio economic status in our study can be attributed to the poor dietary intake, higher incidence of infection and infestation among them. In our study, anemia was found to be significantly higher ($p<0.05$) in vegetarians (41.7%) as compared to non-vegetarians (32.9%). In our study, anemia prevalence was significantly higher ($p<0.001$) in children belonging to joint families (52.7%) as compared to those belonging to nuclear families (31.5%) which may be due to availability of quantitatively as well as qualitatively adequate food in nuclear families. Similarly Sharma et al[12] also observed high percentage of anemia in children belonging to large sized families as compared to those belonging to small sized families.

In our study, percentage of anemia was significantly ($p<0.001$) higher in children of illiterate mothers (which may be attributed to their lack of knowledge about iron rich foods) and also significantly higher in children of working mothers ($p<0.001$) which may be attributed firstly to the decreased capacity of the mother to attend to other activities such as child care and secondly, time constraints imposed by her involvement in work outside may prevent her from attending to the needs of her children. Since the children in this study belonged primarily to low-income families so they were at a double disadvantage. Not only did low economic status have a deteriorating effect on the children's nutrition but, even more, the greatly decreased childcare time available to working mothers had an additional negative effect.

CONCLUSION: In India, the major factor responsible for nutritional anemia in children is delayed weaning and insufficient semisolid and solid food intake by young children. Cereals, pulses and green leafy vegetables are deliberately withheld from the diets of young children because of many wrong beliefs. Ensuring adequate food consumption and regular intake of iron rich and vitamin C rich foods during early childhood period, deworming the child periodically, food fortification, supplementary feeding and nutrition education of parents are some of the strategies that can prevent nutritional anemia in children. The significant association of anemia with socio-economic status, type of family, mother's education and occupation stressed the need to develop strategies for intensive adult education, nutrition education and dietary supplementation including anemia prophylaxis.

REFERENCES:

1. Suryakantha AH (2009). Community Medicine with Recent Advances. 1stedition, 187.
2. J. Kishore (2007). National Health Programs of India. 7th edition, 375.
3. http://www.who.int/vmnis/indicators/haemoglobin.pdf.
4. http://www.merckmanuals.com/professional/hematology_and_oncology/approach_to_the_patient_with_anemia/etiology_of_anemia.html.

5. De Meyer EM. (1989).Preventing and controlling Iron deficiency anaemia through primary health care, WHO, Geneva, 8-26.
6. Sharma DK, Kumar S, Singh R. and Agrawal GC. A study of health status of primary school children in urban area. Ind. J. Com. Med. Sept. - Dec.1984; IX (3): 5-11.
7. Rao NP. Health and nutritional status of rural primary school children. Indian Paediatrics. 1984; 21: 777-782.
8. Panda P, Benjamin AI, Singh S and Zachariah P. Health status of school children in Ludhiana city. Ind. J. Com. Med. Oct- Dec. 2000; XXV (4): 150-55.
9. Semwal J, Srivastava AK, Gupta S, Kishore S, and Chandra R. Nutritional status of school children in rural areas of Dehradun district. Indian J. Prev. Soc. Med. 2006; 37 (1 & 2): 76-81.
10. Hassan MA, and Khalique N. Health Status and Anthropometric Profile of School Going Children (5-15 years) in Aligarh City. Souvenir, 29th Annual Conference of IAPSM and 9th Annual Conference of Maharashtra Chapter of IAPSM; 2002: 12.
11. Chandra Pravin KR, Uma MP, Sadashivappa T, and Prabhakara GN. Nutrition Assessment Survey of School Children of Dharwad and Haliyal Taluks, Karnataka State India. Kathmandu University Journal of Sci., Eng. and Tech. Feb.2006; II (1): 1-6.
12. Sharma P. A study of nutritional status and growth of school children in Meerut. Thesis for M.D. (Paediatrics). 1988; C.C.S. University, Meerut.

AUTHORS:
1. Tania Oberoi
2. Ajay Pratap

PARTICULARS OF CONTRIBUTORS:
1. 2nd Year Post Graduate Student, Department of Paediatrics, Rohitkhand Medical College & Hospital, Bareilly.
2. Associate Professor, Department of Paediatrics, Rohitkhand Medical College & Hospital, Bareilly.

FINANCIAL OR OTHER COMPETING INTERESTS: None

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Ajay Pratap,
Associate Professor,
Department of Paediatrics,
Rohitkhand Medical College & Hospital,
Bareilly.
E-mail: drajay_pratap@yahoo.com

Date of Submission: 25/03/2015.
Date of Peer Review: 26/03/2015.
Date of Acceptance: 16/04/2015.
Date of Publishing: 25/04/2015.