Socio-Demographic Factors Affecting Anemia In School Children In Urban Area Of Meerut, India

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Citation

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Abstract

Objectives: 1.To find out the prevalence of anaemia in primary school children. 2. To study the socio-demographic factors affecting anemia in primary school children (5-11 years) in urban Meerut. Study Design: Cross-sectional. Setting: Govt. Primary Schools of Urban Meerut. Participants: 515 school children (5-11 years). Methodology: Out of a list of all govt. primary schools, 5 were randomly chosen. Students aged 5-11 years were included in the study. Complete data of each child was collected in a pre-designed, pre-tested proforma with estimation of haemoglobin percentage of each child by Sahli's Acid Haematin method. Statistical Analysis: percentages and Chi-square test. Result: Out of 515 children (265 boys and 250 girls), 194 children (37.7 %) were found to be anaemic. Anaemia was found to be more in girls (45.2%) as compared to boys (30.6%). It was found that as socio-economic status decreased, the prevalence of anaemia increased significantly ($x2 = 24.98$, $df= 2$, $p < 0.001$). Percentage of anaemia was significantly ($p = 0.039$) higher in vegetarians and also significantly ($p < 0.001$) higher in children belonging to joint families. Anaemia was significantly higher in children of illiterate and working mothers. Conclusion: The significant association of anaemia 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 anaemia prophylaxis.

INTRODUCTION

Nutritional 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 countries to have highest prevalence of anaemia 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, behavioural 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 anaemia to be 73% in children aged (5-11) years.[2]

The present study was undertaken to determine the prevalence of anaemia in school children aged 5-11 years and an attempt is also made to determine the socio-demographic factors affecting anaemia among this vulnerable group with the following objectives:

1. To find out the prevalence of anaemia in primary school children. 2. To study the socio-demographic factors affecting anemia in primary school children (5-11 years) in urban Meerut.

MATERIAL AND METHODS

The present cross-sectional study was carried out from March 2007 to October 2007 in urban area of Meerut. The study subjects were school going children in the age group of 5-11 years. For the purpose of study, the urban area of Meerut district was divided into four zones. A list of all government primary schools was taken and arranged according to the zones. Equal numbers of students were examined from the randomly selected school/ schools from each zone. The sample size of 384 was calculated by using the formula $n= 3.84pq/SE^2$, assuming the prevalence of anaemia as 50%, with relative precision of 10% at 95% confidence. A total of 515 students (265 boys and 250 girls) in the age group of 5-11 years were interviewed and examined.

They were interviewed through oral questionnaire method

and desired information was collected on pre-designed and pre-tested Performa. The examinations were carried out at school premises in one room which was made available for this purpose. Haemoglobin estimation was done by Sahli's Acid Haematin method. Cut off level of haemoglobin for anaemia in children was taken as 12g/dl.[3] After collection, the whole data was compiled; analyzed and appropriate statistical tests were applied.

Anaemia was graded as mild, moderate and severe.[4]

Figure 1

GRADE	Hb concentration (g/dl)
Mild anaemia	>10 but below the cut off level
Moderate anaemia	Between 7 and 10
Severe anaemia	<7

The social class of the sample group was determined by modified Kuppuswami's classification.[5]

RESULTS

Out of total 515 students, 194 (37.7%) were found to be anaemic. Girls (45.2%) were affected more as compared to boys (30.6%). (Table 1)

Figure 2

Table: I Anaemia in boys and girls

Anaemia	Boys		Girls		Total	
	No.	Percent	No.	Percent	No.	Percent
Present	81	30.6	113	45.2	194	37.7
Absent	184	69.4	137	54.8	321	62.3
Total	265	100.0	250	100.0	515	100.0

χ^2=11.73; df=1; P<0.001

Table II shows the proportion of mild, moderate and severe anaemia in children which was found to be 69.6%, 30.4% and nil respectively.

Figure 3

Table: II Severity and prevalence of Anaemia in children

Grade (g/dl)	Boys (n=265)		Girls (n=250)		Total (n=515)		Prevalence %
	No.	Percent	No.	Percent	No.	Percent	
Mild	55	67.9	80	70.8	135	69.6	26.2
Moderate	26	32.1	33	29.2	59	30.4	11.5
Severe	-	-	-	-	-	-	-
Total	81	100.0	113	100.0	194	100.0	37.7

Table III shows that the prevalence of anaemia was maximum in children belonging to lower social class (100.0%) followed by upper-lower (44.8%), lower-middle (25.9%) and upper-middle (22.2%) and this difference in prevalence of anaemia in relation to social class was found to be statistically significant (p<0.001). Anaemia cases were significantly higher (41.7%) in vegetarians as compared to non-vegetarians (32.9%). It was also observed that anaemia 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 anaemia was significantly (p<0.001) higher in children of illiterate mothers and working mothers (p< 0.001).

Figure 4

Table-III- Socio-demographic factors affecting anemia

Serial No.	Socio-demographic factor	Total	Anaemia		χ^2
			Present	Percent	
1.	Social class				24.98; df=2; P <0.001
	Upper	-	-	-	
	Upper-Middle	45	10	22.2	
	Lower-Middle	170	44	25.9	
	Upper-Lower[a]	290	130	44.8	
	Lower[b]	10	10	100.0	
	Total	515	194	37.7	
	For calculation a and b had been merged				
2.	Dietary Habits				4.23; df=1; P=0.039
	Vegetarian	278	116	41.7	
	Non- Vegetarian	237	78	32.9	
	Total	515	194	37.7	
3.	Family Type				20.27; df=1; P<0.001
	Joint	150	79	52.7	
	Nuclear	365	115	31.5	
	Total	515	194	37.7	
4.	Literacy Status of mother				18.43; df=3; P< 0.001
	Illiterate	263	120	45.6	
	Primary	140	41	29.3	
	Middle	83	20	24.1	
	High School[a]	20	11	55.0	
	Intermediate[b]	8	2	25.0	
	Graduate[c]	1	-	0.0	
	Postgraduate	-	-	-	
	Total	515	194	37.7	
	For calculation a, b and c had been merged				
5.	Occupation Status of Mother				25.45; df=2 P< 0.001
	Housewife	369	114	30.9	
	Non skilled worker	124	68	54.8	
	Semi skilled worker[a]	3	2	66.7	
	Skilled worker[b]	15	10	66.7	
	Clerk/Shop owner/ Farm owner[c]	2	-	0.0	
	Semi Professional	-	-	-	
	Professional[d]	2	-	0.0	
	Total	515	194	37.7	
	For calculation purpose, a, b, c, d have been merged.				

DISCUSSION

In the present study, anaemia was detected in 37.7% (30.6% boys and 45.2% 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) and less than that observed by Anand, et al[12], Gomber et al[13], Ananthakrishnan et al[14] and Shakya et al[15] in their studies (48.8%, 41.8%, 57.1%, 58% respectively). Mullick[16], in her study among school children in Jhansi reported anaemia in 37.48% children which is almost equal to the findings in our study. In all these studies girls were found to be more anaemic than boys which is again similar to the findings in our study. In a study by Shakya et al[14] on nutritional status and morbidity pattern among primary school children of Khatmandu the overall prevalence of anaemia was found to be 58% with 4.5% severe, 16.9% moderate and 36.6% mild anaemia.The proportion of mild, moderate and severe anaemia in our study was found to be 69.6%, 30.4% and nil respectively. Prevalence of anaemia 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[17] 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 anaemia 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 a study by Verma et al[18] on prevalence of anaemia among primary school children of Punjab, it was observed that more vegetarians (65.9%) were anemic as compared to non vegetarians (38%). In our study also, anaemia was found to be significantly higher (p<0.05) in vegetarians (41.7%) as compared to non-vegetarians (32.9%). In our study, anaemia 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[17] also observed high percentage of anaemia in children belonging to large sized families as compared to those belonging to small sized families.

In our study, percentage of anaemia 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 anaemia 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 anaemia in children. The significant association of anaemia 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 anaemia prophylaxis.

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