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Prevalence of Anemia in Rural Adolescent girls of Rohtas district, Bihar

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Abstract
Objectives: *To determine the prevalence of anemia in rural adolescent girls and the socio demographic correlates.* ***Design:*** *school Based cross sectional study.* ***Settings:*** *Two rural schools of Dehri Community development Block of Rohtas District.* ***Material and Methods****: one hundred and seventy six girls from 5th to 10th standard constituted the material of study. The subjects were drawn by systemic random sampling. Prior consent from the parents and school authority was obtained. The subjects were interviewed with help of predesigned and pretested schedule for socio demographic information. They were subjected to hemoglobin estimation by Sahli's method.* ***Statistical Analysis****: Chi square test and t tests.* ***Result****: The prevalence of anemia was found to be 43.2%. Father of 85% and mother of 83% adolescent girls were literate. Three fourth had attained menarche and heavy bleeding within past three months was present in 28%. .Nearly half of the subjects were vegetarian. The socio demographic correlates of anemia were identified and the details are presented later.* ***Conclusion****: Anemia is a significant problem of rural adolescent girls of Rohtas.*
Key Words *: Anemia, Adoloscent girls, school children, Hemoglobin*

I. Introduction

Adolescence is considered as a period of transition from childhood to adulthood. According to World Health Organization adolescents are young people between the ages 10 and 19 years. They constitute a large section of the population(i.e 19% globally and 21.4% in India)². It is a formative period of life and is characterized by rapid physical growth and significant physical and emotional, psychological, and behavioral changes 1. They have to encounter a series of nutritional challenges not only affecting their growth and development but also their livelihood as adults. During the period growth in height accelerates and makes the adolescent vulnerable to iron deficiency anemia. The main nutritional need differs between boys and girls specially after onset of menarche. Iron requirement increases making the girls more vulnerable to iron deficiency anemia besides others. This may extend to their entire reproductive life. Over the years the problem has not changed much as evidenced by figures of NFHS II and NFHS III₃

This study was planned to find out the magnitude of anemia in adolescent girls in rural area of south Bihar and to study socio-demographic factors related to anemia.

II. Methodology

This study was undertaken in Dehri Community Development Block of Rohtas district,Bihar from July 2014- December 2104. The block headquarters is situated at a distance of 8 km from Narayan Medical College Jamuhar , Bihar. A cross sectional design was adopted for this study. Two rural schools of Dehri Development Block were selected by simple random sampling method. The prevalence of anemia among adolescent girls was estimated to be about 55% with a permissible level of error as 15%. The sample size was estimated to be 147. It was rounded to 175, accounting to non-participation due to various reasons. One hundred and seventy six (176) adolescent girls (10- 16years) constituted the study subjects. Prior consent was taken from parents and school authority. Socio demographic information was obtained by interview technique using a predesigned and pretested schedule. Hemoglobin level of each study subject was ascertained by acid hematin method using Sahli's Hemoglobin meter. WHO definition of anemia was used as the criteria for diagnosing anemia.

Adolescent girls were considered anemic when their hemoglobin level was less than 12 gm%. They were also examined clinically for presence of pallor. Data thus generated was analyzed and appropriate tables were generated. Standard x^2 test was used for statistical inferences. For comparing mean height and weight between anemic and non-anemic t- test was used.

III. Results

Magnitude and its correlates:

Out of 176 subjects whose anemia was assessed 76 subjects were found anemic. Thus, the overall prevalence of anemia was 43.2%. A statistically significant association of anemia was found with the socio-economic status of study subjects. The authors submit that though this association may not hold true for higher socio-economic status due to a smaller sample size in that group. In the present study, anemia was more prevalent among girls aged more than 14 years and who have attained menarche. There was no association between parent's education level and anemia. Other factors like type of family, family size, and type of diet were also not significantly associated with anemia.

Severity of anemia

Out of 76 subjects, 65 subjects (85.5%) had mild anemia [Hb 10 to <12 gm%] while 11subjects (14.5%) had moderate anemia [Hb 7 to <10 gm%]. None of the study subjects had severe anemia.

It was found that the mean height and mean weight of subjects with anemia is less as compared with that of subjects without anemia; the difference was statistically significant. Anemia was more prevalent among girls over 14 years (48.8%) and among the girls who have attended menarche
(34.7%)

Table 1 : Age wise distribution of Anemia

Age group	Anemia					
	Present		Absent		Total	
	No	%age	No	%age	No	%age
10-13	37	38.5%	59	61.4%	96	100%
14- 16	39	48.8%	41	51.2%	80	100%
Total	76	43.2%	100	56.8%	176	100%
x^2= 1.85 , df =1 , p = 0.173						

Table 2 : Socio economic status and anemia

SES	Anemia					
	Present		Absent		Total	
	No.	%age	No	%age	No	%age
Class I & II	26	44.1%	33	55.9%	59	100%
Class III	27	32.9%	55	67.3%	82	100%
Class IV& V	23	65.7%	12	34.2%	35	100%
Total	76	43.2%	100	56.8%	176	100%
x^2=10.78 , df =2 , p =0.0046						
NB: For SES Modified BGPrasad (2008-2009) used.						

Table 3(A): Education of parent's and Adolescent Anemia

Mother's education	Anemia					
	Present		Absent		Total	
	No.	%age	No	%age	No	%age
Illiterate	18	62.1%	11	37.9%	29	100%
Primary	29	43.2%	38	56.7%	67	100%
Middle	21	38.8%	33	61.2%	54	100%
High School & above	8	30.7%	18	69.2%	26	100%
Total	76	43.2%	100	56.8%	176	100%
x^2= 6.26 , df =3 , p =0.0996						

Table 3(B): Education Of Parent's and Adoloscent Anemia						
Father's education	Anemia					
	Present		Absent		Total	
	No.	%age	No	%age	No	%age
Illiterate	14	60.8%	9	39.2%	23	100%
Primary	25	50%	25	50%	50	100%
Middle	25	56.8%	19	43.2%	44	100%
High School & above	12	20.3%	47	79.6%	59	100%
Total	76	43.2%	100	56.8%	176	100%
x^2 =19.76 , df = 3 , p =0.133						

Table 4 : Comparison of mean height and mean weight of subjects with and without anemia			
Variable	Subjects with anemia(n=76)	Subjects without Anemia(n= 100)	P Value
Mean Height(in cms)	147.0±6.63	147.29±8.58	P<0.02
Mean Weight(in kg)	38.97±5.43	39.72±6.68	P<0.02

Table – 5 Relation between Menarche and Anemia													
Age group	Menarche		Anemic		Non Anemic		No Menarche		Anemic		Non Anemic		Total
	No	%	No	%	No	%	No	%	No	%	No	%	
10-13	56	58.3	17	17.7	39	40.6	40	41.7	13	13.5	27	28.1	96
14-16	74	92.5	44	55.0	30	37.5	6	7.5	2	2.5	4	5.0	80
Total	130	73.9	61	34.7	69	39.2	46	26.1	15	8.5	31	17.6	176
This table -5 shows that positive correlated with anemic and Menarche													

IV. Discussion

The overall prevalence of anemia among adolescent girls was found to be 43.7% .This was comparable to the study conducted by J Rajaratnam et al (4) in Tamil Nadu and S. S. Biradar et al (5) in Karnataka. Toteja et al (6) found 90% prevalence of anemia among adolescent girls from 16 districts in India. In our study, we found that anemia is more in late adolescent age group (≥ 14 years), which could be related to menstrual loss.

In our study, there was significant association between socio economic status and anemia. Girls belonging to Class IV and V socio economic group had higher prevalence than Class II and III. This finding correlated with S.S.Biradar et al (5) and Kaur et al (7).However, these observations are based on univariate analysis.

The study also highlighted Chronic energy deficiency as an important cause for such high prevalence of anemia as it was found that mean height and mean weight of girls with anemia was significantly lower than those of on anemic girls. Some variables such as age of menarche and type of diet could not significantly influence the extent of anemia. Though, study on larger sample could throw more light in this condition.

V. Conclusion and Recommendation

The high incidence of Anemia in adolescence girls has gained importance in recent past. The current study has shown that the prevalence is alarmingly high (43.2%). Though various factors contribute to prevalence of anemia, this study has shown that socio- economic status, age, menarche and anthropometry are major contributing factors. As more than 43% girls are anemic it is recommended for consumption of Iron supplementation through AWC. It is recommended to educate the girls, her mother and the school teachers regarding the causative factors, Consequences and the ways of prevention. They should be made aware of low cost, iron rich food. This will definitely enhance the health of adolescent girls so that they are prepared for bigger challenges like pregnancy in later life. Millenium development Goals (MDGs) aimed at reduction of Infant and maternal mortality. To achieve this we have to address anemia in adolescent girls. Adolescence, as a period of growth and development, is considered as the best time to assist in physical and mental development, which can prevent maternal anemia later.

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