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PREVALENCE OF ANEMIA AMONG ADOLESCENT GIRLS IN URBAN AREA OF CENTRAL MADHYA PRADESH

Mohan Shinde¹, Anita Shinde², Ashok Shrivastava³

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ABSTRACT: INTRODUCTION: Anemia is a major public health problem worldwide, mainly due to the iron deficiency. Teenagers are at the highest risk of anemia during their adolescent growth spurt. Among girls, however, menstruation increases the risk for iron deficiency anemia throughout their adolescent and childbearing years. **OBJECTIVES:** To estimate the prevalence of anemia among adolescent females and to study the socio-demographic factors associated with anemia. **MATERIAL AND METHODS:** A cross-sectional study was conducted to determine the prevalence of anemia among adolescent girls in urban slum area. A total of 267 school going girls between the ages of 11 and 19 years from the area under urban health training center, community medicine department, Gandhi Medical College, Bhopal, were included in the study. **RESULTS:** The overall prevalence of anemia among adolescent girls was found to be 52.06%. The statistical association of anemia was found with the socio-economic status of the subjects. The mean height and mean weight of subjects with anemia is less as compared with subjects without anemia. **CONCLUSION:** The higher prevalence of anemia amongst adolescent girls indicates a major health problem that requires an urgent solution. The factors such as age, literacy status of mother and father are the factors contributing to the prevalence of anemia. Socio-economic status of the family is also linked with the development of anemia.

KEYWORDS: Anemia, adolescent, prevalence.

INTRODUCTION: Anemia is defined as a low level of hemoglobin in the blood. It is the most prevalent nutritional problem worldwide, mainly due to the iron deficiency. Its prevalence is high among adolescent girls and women of childbearing age, particularly pregnant women.¹ In developing countries it serves as a primary cause for 40% of maternal death either directly or indirectly. World Health report of 2002 identified anemia as one among the top 10 risks for infant mortality, maternal mortality and preterm birth. Prevalence of anemia is very high in vulnerable groups even in higher socioeconomic status.

The adolescent has been defined by the WHO as the period of life spanning the ages between 10 to 19 years.² The physiological growth spurt, psychological and behavioral change with menarche cause an increase in daily iron requirement, which, if not met, can rapidly result in anemia.³ Diagnosis and treatment of anemia is of particular importance in adolescent girls because they enter the reproductive cycle soon after menarche. Even a marginal iron deficiency at this stage can precipitate severe anemia later on due to the stress imposed by pregnancy and child birth. Iron requirements peak during adolescence due to rapid growth and increase in blood volume.⁴ Iron is an essential element for the function of various organs, its deficiency may lead to impaired perception and learning difficulties ending up with declined school success.⁵ In a family with limited resources, the female child is more likely to be neglected. She is deprived of good food and education, and is utilized

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as an extra working hand to carry out the household everyday jobs. Though this study has been planned to highlight the burden of anemia in adolescent girls, it will also be helpful in drawing recommendations and rendering suggestions to evaluate and enhance the existing programmes to control Anemia. The study was conducted with the objectives to estimate the prevalence of anemia among adolescent females and to study the socio-demographic factors associated with anemia.

METHODOLOGY: The study has been planned to highlight the burden of anemia in adolescent girls and to study the socio demographic factors related to anemia. It will be helpful further to reduce the associated morbidities by required interventions. The present study is a cross sectional study, in which 267 girls of the age group 10 to 19 years were selected randomly from the area under urban health training center, Department of Community Medicine, Gandhi Medical College, Bhopal. The study was carried out for a period of four month. The sample size was estimated on the basis of anemia prevalence among adolescent girls with allowable error of 10% and confidence interval of 95%. A house to house survey was carried out and the information about the socio-demographic characteristics was obtained in the pre designed and pretested proforma and the socio-economic status of the family was estimated according to modified Kuppaswamy's scale.

Height and weight of the subjects were measured using standard techniques.⁶ The hemoglobin estimation was done by hemoglobin scale for determination of hemoglobin in blood. The World Health Organization (WHO) hemoglobin color scale has been developed as a simple, inexpensive clinical device for diagnosing anemia. Scale reading showed the scale to have 90% sensitivity and 70% specificity in identifying whether anemia was present or not. In addition, when present, the degree of anemia was correctly classified in clinical terms as moderate, pronounced, or severe, with an overall sensitivity of 60% and specificity of 88%.⁷ Hemoglobin levels in the blood are obtained by using the color of the blood on a strip and comparing to the color chart. The scale consist of standard tints from thirty percent to hundred percent. Girls suffering from any chronic illnesses or receiving any long-term treatment were excluded from the study. Finally, 267 girls were included in the study.

RESULTS:

Sl. No.	Age Group in Years	Number of Girls	
		Number	Percentage
1	Early adolescence (10-13)	31	11.6
2	Middle adolescence (14-16)	139	52.1
3	Late adolescence (17-19)	97	36.3
	Total	267	100.00

Table 1: Distribution of adolescent girls according to age

In the study, maximum girls were in the 10-13 yrs age group (52.1%) followed by 52.1% girls in 14-16 years age group and only 11.6% were belonging to 10-13 year. Prevalence of anemia was found higher in middle adolescence (14-16 years).

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Variables	Subjects with Anemia (n=139)	Subjects without Anemia (n=128)	p-value
Mean height (cm)	142.9 (SD=9.94)	146.2 (SD=4.2)	p<0.05
Mean weight (Kg)	34.2 (SD=6.44)	41.2 (SD=3.23)	p<0.05

Table 2: Comparison of mean height and mean weight of subjects with or without anemia

In the study out of 267 subjects, 139 (52.1%) subjects were found to be anemic and out of the 139 anemic girls, majority of the girls, 98 (70.5%) were having mild (border line) anemia while 39 (28.06%) had moderate and 2 (1.44%) girls had severe anemia. The mean height and mean weight of subjects with anemia is less as compared with subjects without anemia. The difference between the means is statistically found to be highly significant ($p < 0.05$).

Factors	Number of subjects (n = 267)	Subject with anemia (n = 139) No. % (Standard error)	Chi-square	p-value
Socio-economic Status				
II (upper middle)	56	20 35.71 (6.40)		
III (Lower middle)	94	42 44.68 (5.12)		
IV (Upper lower)	90	60 66.66 (4.96)		
V (Lower)	27	17 62.96 (9.29)	17.0258	0.0006
Mother's Education				
Illiterate	29	20 68.96 (8.59)		
Primary	51	33 64.70 (6.69)		
Middle	53	28 52.83 (6.85)		
High School	78	36 46.15 (5.64)		
Graduate & above	56	22 39.28 (6.52)	11.353	0.0228
Father's Education				
Illiterate	21	15 71.43 (9.86)		
Primary	56	35 62.50 (6.47)		
Middle	59	32 54.24 (6.49)		
High School	76	35 46.05 (5.72)		
Graduate & above	55	22 40.00 (6.61)	10.0184	0.0184

Table 3: Socio-demographic correlates of anemia in adolescent girls

In the study a statistical association of anemia was found with the socio-economic status of the subjects. The difference between the mean height and weight of subjects with and without anemia was found highly statistically significant. Among socioeconomic class, higher percentage of anemia was found in class four (upper lower) 66.66% and class five 62.96%. In the study none of the subjects were belonging to upper class (strata I). The prevalence of anemia was found associated with mother's literacy. The prevalence decreases with increased level of mother's education and the similar correlation was also observed with the father's education. This was found to be statistically significant ($p < 0.05$).

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DISCUSSION: The overall prevalence of anemia among adolescent girls was found to be 52.06%, of which 1.44% was having severe anemia, 28.06% moderate anemia and 70.5% mild anemia. The prevalence was found high but matched closely with a few studies from the Indian subcontinent.^{8,9} Toteja et al.¹⁰ found 90% prevalence of anemia among adolescent girls from 16 districts of India, with 7.1% having severe anemia. Bulliyy et al.¹¹ found that 96.5% prevalence among non-school going adolescent girls in three districts of Orissa, of which 45.2%, 46.9% and 4.4% had mild, moderate and severe anemia. Seshadri et al.¹² reported the prevalence of anemia 60% and 63% respectively.

Age of the subjects found contributed to anemia in this study as maximum prevalence was observed in middle adolescent group (52.1%). This denies the reports of study done by Rajini¹³, Kaur¹⁴ and Kotecha¹⁵ who stated that age was not a correlated factor. In the present study a statistical association of anemia was found with the socio-economic status of the subjects. Mehta et al.¹⁶ and Kotecha et al.¹⁵ have reported that educational and socioeconomic status alone may not have any significant effect. In the study, there was no trend observed for anemia related with increase in age of the subjects.

CONCLUSION: In the present study the higher prevalence of anemia amongst adolescent girls indicates a major health problem that requires taking corrective measures to reduce the prevalence of anemia and iron deficiency in adolescent girls. The emphasis should be on availability of iron and folic acid tablets at all levels and to increase the compliance regarding consuming tablets and acceptance of them among adolescent girls. Nutritional status of adolescent girls should be improved through counseling and health education.

The factors such as age, literacy status of mother and father are the factors contributing to the prevalence of anemia. Socio economic status of the family is also linked with the development of anemia.

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AUTHORS:

1. Mohan Shinde
2. Anita Shinde
3. Ashok Shrivastava

PARTICULARS OF CONTRIBUTORS:

1. Professor, Department of Community Medicine, Gandhi Medical College, Bhopal.
2. Professor, Department of Chemistry, Government Institute for Excellence in Higher Education, Bhopal.
3. Medical Officer, Department of Pathology, Gandhi Medical College, Bhopal.

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NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Mohan Shinde,
Nice-19, Riviera Town,
Phase 1, Matamandir,
Bhopal-462003, M. P.
E-mail: msbpl1984@gmail.com
Shinde_mohan@hotmail.com

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