

Prevalence and Sociodemographic Factors Related to Anemia among Adolescent Girls in a Rural Area

Kaneez Fatema Shaikh¹, Shobha Moses², Abdul Waheed Khan³

¹Assistant Professor, Department of Gynecological Oncology, Government Medical College and Cancer Hospital, Aurangabad, Maharashtra, India, ²Professor and Head, Department of Obstetrics and Gynaecology, Dr. C. J. Macaden's Postgraduate Training Institute of Jalna Mission Hospital, Jalna, Maharashtra, India, ³Assistant Professor, Consultant Neonatologist and Pediatrician, Muskaan Children Hospital, Jalna, Maharashtra, India

Abstract

Background: During adolescence, the nutrition and health needs are more along with that initiation of menstruation in the adolescent period is an added burden and serves as a trigger to the already vulnerable adolescent girl to develop anemia.

Aims and Objectives: (1) To find out the prevalence of anemia among adolescent girls. (2) To find sociodemographic factors related to anemia among adolescent girls in a rural area.

Materials and Methods: A community based cross-sectional study was carried out in two villages of rural field practice area during 2022 - 2023. Totally 163 adolescent girls who are residing in the study area for a minimum period of 6 months were included in the study.

Results: The prevalence of anemia among adolescent girls was found to be 128 (78.5%). Out of 128 anemic girls, 97 (75.8%) girls were suffering from a mild degree of anemia and 31 (24.2%) girls were having moderate degree of anemia. Nobody was suffering from severe anemia. Prevalence of anemia in adolescent girls is significantly higher in girls of illiterate or primary educated mothers ($P = 0.0001$), low socioeconomic status families ($P = 0.029$), H/O excessive menstrual bleeding ($P = 0.0005$), no H/O intake of IFA in last 6 months ($P = 0.0001$) and girls with under nutrition ($P = 0.034$).

Conclusion: The overall prevalence of anemia among adolescent girls was found to be 78.5% that is quite high. Meticulous implantation of programs for the prevention of anemia among adolescent girls through nutrition education and anemia prophylaxis. A significant association of anemia with socio-economic status of families and mothers educational status suggests a need to develop strategies for intensive female education and to improve the socio-economic status of the population through poverty alleviation programs.

Key words: Anemia, Adolescent girls, IFA tablets, Menstrual bleeding, Undernutrition

INTRODUCTION

Anemia is one of the most common public health problem worldwide and especially in developing countries. Based on the World Health Organization (WHO) criteria, more than two billion people globally and 149 million people in the Eastern Mediterranean Region are estimated to be anemic.^[1]

Girls' iron requirements increase dramatically during adolescent as a result of the expansion of the lean body mass, total blood volume and the onset of menstruation; these changes make adolescent girls more susceptible to anemia, which has lasting negative consequences for them and for the survival, growth, development of their children later in life. India is a home to nearly 113 million adolescent girls, and the prevalence of anemia in adolescent girls is estimated at 56%.

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 as an extra working hand to carry out the household chores. The added burden of menstrual blood loss, normal or abnormal, precipitates the crises too often.^[3]

Access this article online



www.ijss-sn.com

Month of Submission : 01-2024
Month of Peer Review : 02-2024
Month of Acceptance : 03-2024
Month of Publishing : 03-2024

Corresponding Author: Dr Abdul Waheed Khan, Consultant neonatologist and pediatrician, Muskaan children hospital, Jalna, India.

Anemia is one of the major challenges India is still facing. During adolescence, the nutrition and health needs are more because of the growth spurt and increase in physical activity.

Initiation of menstruation in a girl in the adolescent period is an added burden and serves as a trigger to the already vulnerable adolescent girl to develop anemia. Life course approach under Reproductive and Child Health program envisages the fact that a healthy girl child becomes a healthy adolescent, and a healthy adolescent becomes a healthy mother who gives rise to a healthy child. Anemia in adolescent girls leads to a higher maternal mortality, perinatal mortality, neonatal mortality, high incidence of low birth weight babies, and increased fetal wastage. In India, many times the girl gets pregnant even before the growth period is over, thus doubling the risk for anemia. It is therefore imperative to identify the burden of anemia and the cause among adolescent girls for appropriate intervention.^[4]

MATERIALS AND METHODS

According to survey registers of Rural Health and Training Centre, the total number of adolescent girls in the age group of 10- 19 years was 192 in these villages. It was decided to include all unmarried adolescent girls in the age group 10-19 years for the study. Adolescent girls who are residing in the study area for a minimum period of 6 months were included. Out of all adolescent girls, 163 girls were included in the study. The rest of the girls were either absent in their houses or sick during data collection. The girls whose parents did not give consent for the hemoglobin (Hb)% estimation were excluded from the study. Data were collected in a friendly atmosphere after obtaining the consent from adolescent girls or mothers of minor adolescent girls. A pre- designed, pre-tested questionnaire was used to collect the information about the participants. Information regarding sociodemographic characteristics like age, educational status of both father and mother, family size, per-capita monthly income and personal history like age at menarche, history of worm infestation, excessive menstrual bleeding in the past 3 months and dietary history were collected. Relevant clinical examination including height, weight and Hb% estimation was done.

Height: It was measured by using standard height measuring scale and for that patient was made to stand barefoot on a flat floor against the scale.

Weight: It was measured by using standard electronic weighing machine and weight was recorded without any footwear.

Collection of blood samples: It was done under strict aseptic precaution. 2 ml of venous blood was drawn by venipuncture (ante cubital vein) and it was collected with ethylene diamine tetra-acetic acid. Hb was estimated by cyan methemoglobin method in the Department of Pathology, Government Medical College, Aurangabad, Maharashtra, India.

The data thus collected were processed and analyzed by SPSS version 16.

RESULTS

Out of 163 adolescent girls 90 (55.2%) belonged to late adolescent age group, 32 (19.6%) were in mid- adolescent age group and 41 (25.2%) belonged to early adolescent age group. Majority of the girls belonged to OBC category 91 (55.8%), followed by general category 67 (41.1%) and SC/ST only 5 (3.1%). It was observed that most of the adolescent girls 81 (49.7%) have completed secondary education, followed by 46 (28.2%) completed higher secondary education. 32 (19.6%) of girls have completed primary education and only 4 (2.5%) girls have completed their graduation. Among fathers of adolescent girls majority 86 (52.8%) completed their primary education, 61 (37.4%) have studied up to secondary education, 10 (6.1%) have gone up to higher secondary level and only 4 (2.5%) have completed graduation and only 2 (1.2%) of them are illiterate. 108 (66.2%) mothers of adolescent girls have completed primary education and 52 (31.9%) have studied up to secondary education, and only 3 (1.9%) were illiterate.

Among fathers of adolescent girls, 42 (25.8%) were unskilled worker, 59 (36.2%) were skilled workers, and 62 (38%) were service holders (clerical, teachers etc.).

As per modified Prasad's classification (taking into consideration All India Consumer Price Index of April 2012) 121 (74.2%) families were belonging to lower socio- economic group and 42 (25.8%) families were belonging to middle socio-economic group. The present study findings showed 99 (60.7%) families were nuclear type followed by 64 (39.3%) were joint families.

Present study findings showed mean Hb level of adolescent girls was 10.84 ± 1.05 g/dl and the range varies from 8 to 12.8 g/dl. The prevalence of anemia among adolescent girls was found to be 128 (78.5%). Out of 128 anemic girls, most of the 97 (75.8%) girls were suffering from a mild degree of anemia and 31 (24.2%) were suffering from a moderate degree of anemia. No one was found to be severely anemic [Table 1].

When girls were assessed for nutritional status by assessing body mass index (BMI), it was observed that 80 (49%) of the girls were below the 5th percentile and 83 (51%) of the girls were in the normal range of BMI i.e. 5th to 85th percentile for girls [Figure 1].

Present study findings showed that prevalence of anemia was 78 (86.7%) in the late adolescent age group the as compared to 21 (65.6%) in mid and 30 (73.2%) in early adolescent age group, and this difference found statistically significant ($P = 0.023$). Those adolescent girls whose mothers were educated primary or less found more anemic compared to girls of highly educated mothers ($P = 0.0001$). However, there was no significant association found with father's education and occupation and anemia of adolescent girls [Table 2].

Type of family and number of siblings had not shown any significant association with anemia in adolescent girls, but anemia was significantly higher in lower socio-economic status families compared to families with middle socio- economic status ($P = 0.029$).

Adolescent girls who had taken IFA tablets within last 6 months had lesser prevalence of anemia compared to those who had not taken the same, and this association was found statistically significant ($P = 0.0001$). Also prevalence of anemia was found more in girls with heavy menstrual flow ($P = 0.0005$) and girls with under-nutrition i.e. <5th percentile of BMI for girls ($P = 0.034$) compared to their counterparts. However other personal characteristics like dietary habit, H/O worm infestation and menarche status did not show any significant association with the presence of anemia [Table 3].

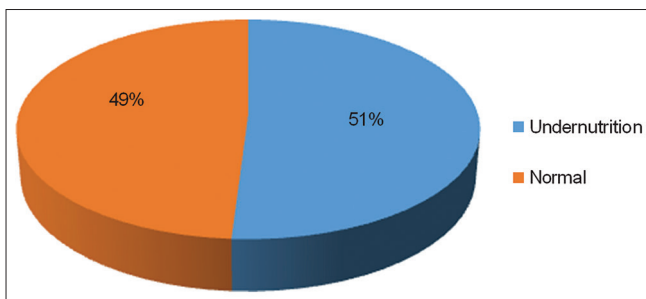


Figure 1: Nutritional status of adolescent girls (body mass index for girls – Center Disease for Control)

Table 1: Distribution of adolescent girls according to severity of anaemia (n=128)

Anaemia	Frequency (%)
Mild (10-12 g/dl)	97 (75.8)
Moderate (7-10 g/dl)	31 (24.2)
Total	128 (100)

DISCUSSION

Present study showed out 163 adolescent girls 78.5% was found to be anemic. Study conducted by Kulkarni *et al.*^[5] showed a higher prevalence of anemia among adolescent girls 90.1% compared to our study. Ramachandran *et al.*^[4] and Chaturvedi *et al.*^[6] reported a prevalence of anemia among adolescent girls 73.5% and 73.7% respectively that

Table 2: Distribution of adolescent girls according to various socio-demographic factors associated with anaemia

Factors	Total girls	Anaemic girls (%)	Remarks
Adolescent age group 1	41	30 (73.2)	$\chi^2=7.514$
0-13 years (early)			
14-15 years (mid)	32	21 (65.6)	$P=0.023$
16-19 years (late)	90	78 (86.7)	
Mother's education			
Primary or less	111	97 (87.4)	$\chi^2=16.2$
Secondary or more	52	31 (59.6)	$P=0.0001$
Father's education			
Primary or less	88	71 (80.7)	$\chi^2=0.275$
Secondary or more	75	58 (77.3)	$P=0.6$
Father's occupation			
Unskilled worker	42	36 (85.7)	$\chi^2=1.878$
Skilled worker	59	44 (74.6)	$P=0.391$
Service holder (clerical)	62	48 (77.4)	
Type of family			
Nuclear	99	78 (78.8)	$\chi^2=0.019$
Joint	64	51 (79.6)	$P=0.89$
Social class			
Low	121	100 (82.6)	$\chi^2=4.72$
Middle	42	28 (66.7)	$P=0.029$
Number of siblings			
1 or nil	39	33 (84.6)	$\chi^2=0.93$
2 or more	124	96 (77.4)	$P=0.334$

Table 3: Association of personal characteristics and anaemia in adolescent girls

Characteristics	Total girls	Anaemic girls (%)	Remarks
Dietary habit			
Veg	8	7 (87.5)	$\chi^2=0.401$ $P=0.526$
Mixed	155	121 (78.1)	
H/O worm infestation			
Present	52	43 (82.7)	$\chi^2=0.785$ $P=0.375$
Absent	111	85 (76.6)	
IFA taken within 6 months			
Yes	35	12 (34.3)	$\chi^2=51.74$ $P=0.0001$
No	128	116 (90.6)	
Menarche			
Attained	132	101 (76.5)	$\chi^2=1.667$ $P=0.196$
Not attained	31	27 (87.1)	
Menstrual flow (n=132)			
Heavy	72	64 (88.9)	$\chi^2=12.17$ $P=0.0005$
Normal	60	38 (63.3)	
Nutritional status			
Undernutrition	79	68 (86.1)	$\chi^2=4.466$ $P=0.034$
Normal	84	61 (72.6)	

are similar to our study findings. While WHO/UNICEF has suggested that the problem of anemia is of very high magnitude in a community when prevalence rate exceeds 40%.^[7]

In present study prevalence of anemia was found more 78 (86.7%) in the late adolescent age group as compared to 21 (65.6%) in mid and 30 (73.2%) in early adolescent age group. Similar findings were observed by study conducted by Chaudhary and Dhage.^[8]

A significant association was found between the prevalence of anemia and educational status of the mother in our study, and it reflects better awareness among mothers with higher education. Similar association was founded by Jolly Rajaratnam *et al.*^[9] and Chaudhary and Dhage⁸ in their study.

In the present study prevalence of anemia was found significantly higher in lower socio-economic status families than families with middle socio-economic status ($P = 0.029$). However, Kulkarni *et al.*^[5] reported no significant association between prevalence of anemia and socioeconomic status of families. This is contrast to our study findings.

Prevalence of anemia was found low in girls with history of intake of Iron tablets within last 6 months compared to those who had not taken the IFA tablet within last 6 months and this association was highly significant ($P < 0.0001$). Hashizume *et al.*^[10] also found that the high iron intake was significantly associated with decreased prevalence of anemia.

In the present study the prevalence of anemia was found to be more in adolescent with excessive menstrual bleeding than their counterparts and this association found to be statistically significant ($P = 0.0005$). These study findings are similar with study conducted by Kaur *et al.*^[11]

In our study, we found that the prevalence of anemia was significantly higher among adolescent girls with undernutrition compared to girls with normal nutritional status ($P = 0.034$). Siddharam *et al.*^[12] also reported a similar association between anemia and BMI.

CONCLUSION AND RECOMMENDATIONS

The overall prevalence of anemia among adolescent girls was found to be 78.5% which is quite high. Because most of the cases were found to have a mild degree of anemia (75.8%), there is a great scope for early intervention to bring the Hb level in the normal range. A significant association of anemia with socio-economic status of families and mothers educational status suggests a need to develop strategies for intensive female education and to improve the socio-economic status of the population through poverty alleviation programs. This should be supported by programs for the prevention of anemia among adolescent girls through nutrition education and anemia prophylaxis.

REFERENCES

1. Ramzi M, Haghpanah S, Malekmakan L, Cohan N, Baseri A, Alamdari A, *et al.* Anemia and iron deficiency in adolescent school girls in Kavar urban area, southern Iran. *Iran Red Crescent Med J* 2011;13:128-33.
2. UNICEF. The Adolescent Girls Anaemia Control Programme. Breaking the intergeneration cycle of undernutrition in India with a focus on adolescent girls. Briefing Paper Series 14; 2011. p. 5.
3. Patnaik S, Patnaik L, Kumar A, Sahu T. Prevalence of anemia among adolescent girls in a rural area of Odisha and its epidemiological correlates. *Indian J Matern Child Health* 2012;15:1-11.
4. Ramachandran R, Majumdar A, Kar SS. Prevalence and risk factors of anaemia among adolescent girls residing in a rural community of Puducherry. *Indian J Matern Child Health* 2013;15:1-10.
5. Kulkarni MV, Durge PM, Kasturwar NB. Prevalence of anemia among adolescent girls in an urban slum. *Natl J Community Med* 2012;3: 108-11.
6. Chaturvedi S, Kapil U, Gnanasekaran N, Sachdev HP, Pandey RM, Bhanti T. Nutrient intake amongst adolescent girls belonging to poor socioeconomic group of rural area of Rajasthan. *Indian Pediatr* 1996;33:197-201.
7. WHO/UNICEF: Indicators for Assessing Iron Deficiency and Strategies for its Prevention. Draft Based on a WHO/UNICEF Consultation. Geneva: World Health Organization; 1996.
8. Chaudhary SM, Dhage VR. A study of anemia among adolescent females in the urban area of Nagpur. *Indian J Community Med* 2008;33:243-5.
9. Rajaratnam J, Abel R, Asokan JS, Jonathan P. Prevalence of anemia among adolescent girls of rural Tamilnadu. *Indian Pediatr* 2000;37:532-6.
10. Hashizume M, Shimoda T, Sasaki S, Kunii O, Caypil W, Dauletbaev D, *et al.* Anaemia in relation to low bioavailability of dietary iron among school-aged children in the Aral Sea region, Kazakhstan. *Int J Food Sci Nutr* 2004;55:37-43.
11. Kaur S, Deshmukh PR, Garg BS. Epidemiological correlates of nutritional anemia in adolescent girls of rural Wardha. *Indian J Community Med* 2006;31:255.
12. Siddharam SM, Venketesh GM, Thejeshwari HL. A study of anemia among adolescent girls in rural area of Hassan district, Karnataka, South India. *Int J Biol Med Res* 2011;2:924.

How to cite this article: Shaikh KF, Moses S. Prevalence and Sociodemographic Factors Related to Anemia among Adolescent Girls in a Rural Area. *Int J Sci Stud* 2024;11(12):58-61.

Source of Support: Nil, **Conflicts of Interest:** None declared.