

A cross sectional study of anemia among adolescent girls in a Women's College in Bagalkot, Karnataka

Bhagyalaxmi Sidenur¹, Gowri Shankar^{2*}

¹PG Student, ²Professor, Dept. of Community Medicine, S. Nijalingappa Medical College & HSK Hospital, Bagalkot

***Corresponding Author:**

Email: drgowrijnmc@gmail.com

Abstract

Introduction: Adolescence is a journey from the world of the child to the world of the adult. Adolescence is very important since it is the time in life when major physical, psychological and behavioral changes take place. Anemia among adolescent girls is a major public health problem.

Objective: To assess anemia by Haemoglobin status in adolescent girls studying in Akkamahadevi women's Arts and Science College, Bagalkot.

Materials and Method: A Cross Sectional Study was done among adolescent girls studying in Akkamahadevi Women's Arts and Science College, Bagalkot from October-November 2016 which is situated near the urban health training centre of S.N Medical College, Bagalkot. Universal sampling was considered as we included all the new admissions of 2016 i.e. 144. After taking informed consent adolescent girls were assessed for anemia by Hb status and anthropometric measurements. Data compiled and tabulated by using MS EXCEL and analysed, using percentages and chi square test.

Result: Anemia was observed in 89% of adolescent girls. Among them 23% had mild anemia, 63% had moderate and 3% had severe anemia. Adolescent girls from rural areas attending college had more thinness i.e. 22.8% compared to urban girls (5.6%) whereas severe thinness was observed more in urban girls(13.5%) than rural girls(4.3%) which was statistically significant($p < 0.009$).

Conclusion: The study revealed that majority of the adolescent girls had anemia. Hence early diagnosis of anemia is needed so that prompt interventions can be done in the way of health education and supplementation.

Keywords: Adolescent, Nutritional status, Anemia

Introduction

Adolescence is a transition period from child to adult. Adolescence is defined by WHO as the period of life spanning the ages between 10-19 years which is a period where both physical as well as psychological changes occur.⁽¹⁾ Nutrition is one of the influencing factors in this period. Adolescence represents a window of opportunity to prepare nutritionally for a healthy adult life. Under-nutrition among adolescent girls is a major public health problem.⁽²⁾ Many adolescents are suffering from iron deficiency which is affecting their health and physical stamina. Studies indicate that the incidence of anaemia in adolescents increases with age and corresponds with the highest acceleration of growth during adolescence. The highest prevalence is between the ages of 12-15 years when requirements are at peak. More than 50% girls in this age group have been reported to be anaemic.⁽³⁾ Anemia due to lack of iron in girls is the third cause of years lost to death and disability.⁽⁴⁾ In all South - East Asian countries, except Thailand, more than a quarter of girls are anaemic, As per NFHS 3, the prevalence of under nutrition was 56%. In India, malnutrition is even higher i.e. 47% adolescent girls are undernourished and 56% are anemic.⁽⁵⁾ Adolescents are at high risk of iron deficiency anaemia due to increased requirements for iron, poor dietary intake of iron, high rate of infection and worm infestation. Menstruation typically starts about one year after peak growth and requirements for

iron remain high throughout the reproductive life. There is a regular loss of 12.5-15 mg iron per month or 0.4-0.5 mg iron per day in menstrual blood. Therefore, in girls following the growth spurt, the risk of iron deficiency continues to be a public health concern throughout the entire reproductive age.⁽³⁾ Undernutrition in adolescent girls leads to a higher Maternal Mortality, Perinatal Mortality, Neonatal Mortality, high incidence of low birth weight babies transmitting under nutrition to future generations. Life course approach under RMNCH+A programme highlights 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.⁽⁶⁾ Hence this study was undertaken to know the anemia status in girls attending women's college in Bagalkot.

Objective

To assess anemia status in adolescent girls studying in Akkamahadevi Women's Arts and Science College, Bagalkot.

Materials and Method

A Cross Sectional Study was done among adolescent girls studying in Akkamahadevi women's Arts and Science College, Bagalkot which is situated near Urban health training centre of S.N. Medical college from October-November 2016. Universal sampling was considered as we included all the new

admissions of 2016 i.e. 144. Pre designed, semi structured questionnaire and Sahli's Haemoglobinometer was used to measure Hb %. Anthropometric measurements such as weight and height were measured and BMI was calculated by $\text{Weight(kg)/Height(m}^2\text{)}$.

Measurement of weight: Study subjects were measured for their weight to nearest 0.5 kg using standard portable weighing machine without wearing footwear.

Measurement of height: Height measurement was taken in erect standing position barefoot with feet together, heels against the wall & looking straight ahead. Then marking was made on wall and measured with tape.

Undernutrition included thinness and severe thinness which are defined below:⁽⁷⁾

Weight Status Category	Z scores Range
Normal	-2 SD to +2 SD
Thinness	Less than -2 SD to More than and equal to -3 SD
Severe Thinness	Less than -3 SD
Overweight	More than +1 SD
Obese	More than +2 SD

Stunting and Severe Stunting is defined as height for age less than -2 SD to > -3SD of Z score Values and < -3 SD of Z score values respectively.⁽⁸⁾

Anemia was defined based on haemoglobin levels using WHO cut off values,⁽⁹⁾ Normal: >12, Mild anemia: 11-11.9, Moderate anemia: 8-10.9, Severe anemia: <7.

Data analysis was done using SPSS version 20 by using percentages and chi-square test.

Results

Out of 144 adolescent girls, 115 girls were 18 years old and remaining 29 were 19 years old. Among them, 63.9% of adolescent girls were from rural area and 32.1% were from urban area. Anemia was observed in 89% of adolescent girls. Among them 23% had mild anemia, 63% had moderate and 3% had severe anemia.(Fig. 1).

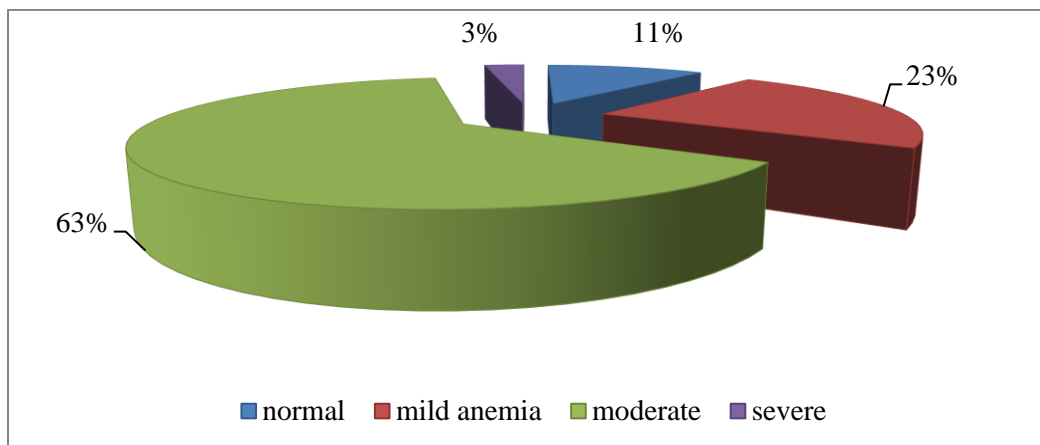


Fig. 1: Distribution of adolescent girls according to Haemoglobin %

Moderate anemia in both urban and rural girls was similar i.e. 63%. Severe anemia was more in rural girls (3.3%).

The percentage of adolescent girls with stunting was 88%. Thinness was observed in 16.7% of adolescent girls and severe thinness in 6.7%.(Fig. 2).

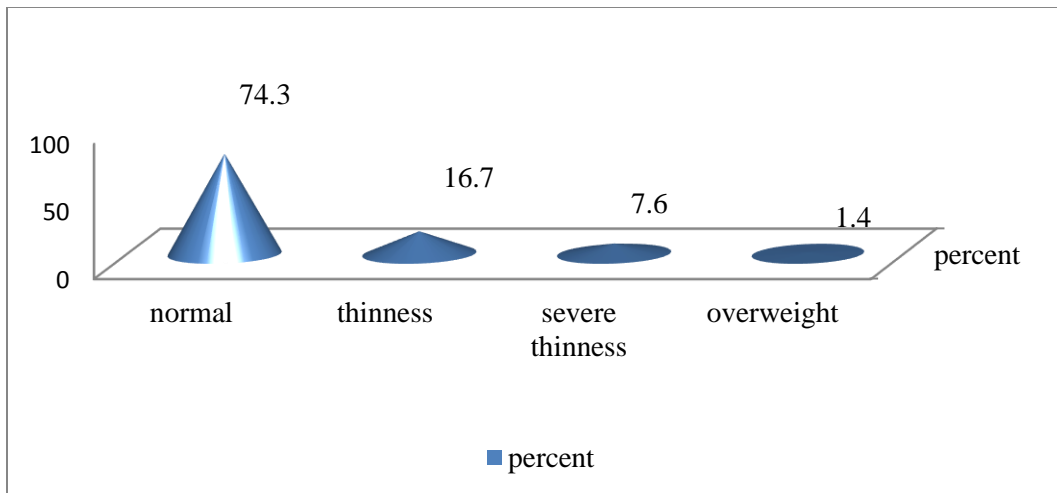


Fig. 2: Distribution of adolescent girls according to Body mass index

Among adolescent girls with thinness, 12.5% had mild and 66.7% had moderate and 9.1% had severe anemia and among adolescent girls with severe thinness, 9.1% had mild and 63.6% had moderate anemia(Fig. 3). In girls from rural area, 63% had moderate and 3.3% had severe anemia. In urban girls, 63.5% had moderate and 1.9% had severe anemia. It was noted that 35% of the girls had dysmenorrhea. Dysmenorrhea was reported in 9.3% of the girls who were severely thin and in 24.1% of the girls having mild anemia and 3.7% with severe anemia.

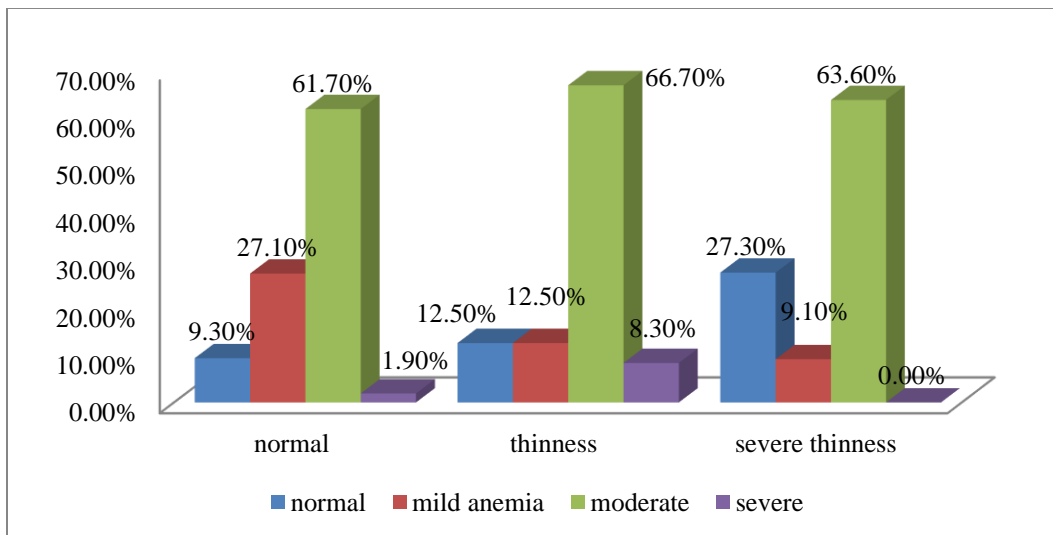


Fig. 3: Association of BMI and Hb % in adolescent girls

Adolescent girls attending college from rural area had more thinness i.e. 22.8% compared to urban girls (5.6%) whereas severe thinness was noted more in urban girls(13.5%) than rural girls(4.3%) which was statistically significant($p < 0.009$). (Table 1)

Table 1: Association between place of residence of adolescent girls and body mass index

	Normal BMI		Thinness		Severe thinness		Overweight	
	n	%	n	%	n	%	N	%
Urban	41	78.8	3	5.8	7	13.5	1	1.9
Rural	66	71.1	21	22.8	4	4.3	1	1.1
Total	107	74.3	24	16.7	11	7.6	2	1.4

Chi square- 10.36

$p = 0.009$

Discussion

In our study, anemia was seen in 89% of the girls. In a study done in a rural area in Tamil Nadu it was observed that 55.9% of the girls had anemia.⁽¹⁰⁾ This indicates the gravity of the situation.

In this study, 23% had mild anemia, 63% had moderate and 3% had severe anemia. In a cross sectional adolescent girls study done in a rural area of Hassan district, it was observed that prevalence of anemia was 45.2%. In them, 40.15% had mild anemia, 54.93% had moderate anemia and 4.92% had severe anemia.⁽¹²⁾ Our results are consistent with another study done in rural area in Tamilnadu where 76.5% of the girls had mild anemia while 2% had severe anemia. This finding may be explained by the fact that menstrual blood loss is a significant cause for anemia after menarche.⁽¹¹⁾

In this study, stunting was seen in 88% and thinness in 16.7% of the adolescent girls. In a study done among rural adolescent girls of Belgavi it was found that prevalence of thinness and stunting was 57% and 59.8% respectively.⁽¹¹⁾ This indicates chronic malnutrition and indicates lack of knowledge regarding balanced diet among girls and their parents.

In adolescent girls with thinness, 12.5% had mild, 66.7% had moderate and 9.1% had severe anemia. Among girls with severe thinness, 9.1% had mild and 63.6% had moderate anemia. According to a study done among male and female medical students in north east Karnataka, among 50 females 12 had BMI <18.5 kg/m² and had hemoglobin below normal limits.⁽¹³⁾ This may be due to the fact that girls from rural areas leave home early to attend the college which starts at 8 a.m. and usually skip breakfast and even the lunch and return home in the early evening hours for the sake of education.

Conclusion

The present study revealed that higher percentage of thinness was seen in rural girls attending college compared to urban girls. Dysmenorrhea was significantly higher in anemic girls and those with low BMI. Anemia in adolescent girls was significantly high in those with low BMI. Hence early diagnosis of undernutrition and anemia is needed so that prompt intervention can be done in the way of health education. Yearly health checkups, Hb % estimation and 6 monthly albendazole is to be advised through the Head of women's college. The importance of balanced diet should be stressed through messages like "No fasting and No feasting". RMNCH+A which focusses on weekly iron supplementation and menstrual hygiene can be informed and they can access these services through their anganwadis. Subsidised breakfast and lunch could be arranged in the college premises. Even colleges can be started in smaller towns or more

number of free hostels for girls should be started in urban areas.

Acknowledgement

We are thankful to Akkamahadevi women's Arts and Science College, Bagalkot for their cooperation and UHC staff for their help during data collection and study participants who had participated in the study.

Conflict of interest

There is no conflict of interest.

References

1. Borkotoky R. Anemia and its effect on Academic performance of Adolescent girls of Sivasagar Town. Indian Journal of maternal and child health. 2011;Jan-mar;13(1):1-5.
2. Premalatha T, Valarmathi S, Srijayanth P, Sundar JS, Kalpana S. Prevalence of Anemia and its Associated Factors among Adolescent School Girls in Chennai, Tamil Nadu, INDIA. Epidemiol. 2012;2:118.
3. WHO. Prevention of iron deficiency anemia among adolescents.pdf.
4. WHO. Adolescents: health risks and solutions, factsheet, updated May 2016. Available from: URL: <http://www.who.int/mediacentre/factsheets/fs345/en/> [last accessed on 3/04/2017].
5. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS-3), 2005–06: India: Volume I. Mumbai: IIPS. Available from: URL: <http://dhsprogram.com/pubs/pdf/FRIND3/FRIND3-Vol1andVol2.pdf> [last accessed on 25/10/2016].
6. Ramachandran R, Majumdar A, Kar S S. Prevalence and risk factors of anaemia among adolescent girls residing in a rural community of Puducherry. Indian Journal of maternal and child health. 2013;Oct-Dec;15(4):1-10.
7. WHO. Growth reference 5-19 years. Available from: URL: http://www.who.int/growthref/who2007_bmi_for_age/en/ [last accessed on 23/08/2016].
8. WHO. Growth reference 5-19 years. Available from: URL: http://www.who.int/growthref/who2007_height_for_age/en/ [last accessed on 23/08/2016].
9. WHO. Haemoglobin concentrations for the diagnosis of anemia and assessment of severity. Available from: URL: <http://www.who.int/vmnis/indicators/haemoglobin.pdf?ua=1> [last accessed on 23/08/2016].
10. Rajini S, Ethirajan N, Swarnapriya V, Felix AJ, Mittal A. Prevalence of anemia and factors influencing among rural adolescent girls in Tamilnadu. Indian Journal of maternal and child health. 2010 Oct-Dec;12(4):1-7.
11. Baliga SS, Naik VA, Mallapur MD. Nutritional Status of Adolescent girls residing in rural area: A Community Based Cross sectional study. Journal of the Scientific Society. 2014 Jan-Apr;41(1):22-5.
12. Siddharam SM, Venketesh GM, Thejeshwari HLA. Study of Anemia among Adolescent Girls in Rural Area of Hassan district, Karnataka, South India. Int J Biol Med Res. 2011;2(4):922-4.
13. Anithalakshmi, Govindaraj J. Correlation of Haemoglobin with Body Mass Index in Male and Female Medical Students in North East Karnataka. Journal of Bioscience and Technology. 2015;6(3):709-12.