

Anaemia and Its Determinants among Adolescent Medical Students of a Health University in Tumkur, Karnataka, India

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Abstract

Introduction: Adolescence is the period of most rapid growth second to childhood. The physical and physiological changes that occur in adolescents place a great demand on their nutritional requirements and make them more vulnerable to anemia. Anemia in adolescence causes reduced physical and mental capacity and diminished concentration in work and also possess to major threat to future safe mother hood in girls. Medical students, even though from a good socio-economic background, are vulnerable to anaemia because of poor diet and increased physiological demand.

Methodology: This cross-sectional study was undertaken among adolescent medical students of a health university in Tumkur, India.

Results: In this study, anaemia was seen in 11 (11.22%) of the study subjects. There was a statistically significant association between anaemia and sex, type of diet, consumption fruits, and presence of pallor.

Conclusion: In the present study, anaemia was seen in 11 (11.22%) of the study subjects. Socio economic factors have a significant role in occurrence of anaemia which later manifests itself as poor performance.

Keywords: Anganwadi, nutritional assessment, undernutrition, socio demographic factors

Introduction

Adolescence is a period of transition from childhood to adulthood. It is characterised by rapid physical, biological and hormonal changes resulting in psychosocial, behavioural and sexual maturity in an individual. Anaemia, a manifestation of under-nutrition and poor dietary intake of iron is a public health problem, not only among pregnant women, infants and young children but also among adolescents. Anaemia in India primarily occurs due to iron deficiency and is the most widespread nutritional deficiency disorders in the country today. The prevalence of anaemia in girls (Hb<12g%) and in boys (Hb< 13g%) is high as per the reports of NFHS-3 and the National Nutrition Monitoring Bureau Survey. According to NFHS 3 data, over 55 percent of both adolescent boys and girls are anaemic.¹

Anaemia is a condition in which the number of red blood cells (RBCs), and consequently their oxygen-carrying capacity, is insufficient to meet the body's physiological needs. Anemia is characterised by

reduction in number of red blood cells or haemoglobin concentration. AWHO expert group proposed that anemia or deficiency should be consider to exist when the haemoglobin is below 13g/dl and 12g/dl in males and females respectively.^{2,3}

Adolescence is the period of most rapid growth second to childhood. The physical and physiological changes that occur in adolescents place a great demand on their nutritional requirements and make them more vulnerable to anemia. Anemia in adolescence causes reduced physical and mental capacity and diminished concentration in work and also possess to major threat to future safe mother hood in girls.^{4,5}

Medical students, even though from a good socio-economic background, are vulnerable to anaemia because of poor diet and increased physiological demand. There is a need to study the magnitude of anaemia in medical students.

Hence this study was undertaken to study health status and burden of anaemia among adolescent medical students.

Objectives of the Study

- i. To find out the burden of anaemia among the study subjects
- ii. To assess the various determinants of anaemia among the study subjects

Method

This cross-sectional study was conducted during January 2018 to December 2018 at a Health university in Tumkur, Karnataka, India. First & second year medical students of Sri Siddhartha Medical College aged ≤ 19 yrs during the study period.

Inclusion criteria

1. First & second year medical students with aged ≤ 19 yrs studying at Sri Siddhartha medical college, Tumkur, who consent for the study.

Exclusion criteria

1. Students who are chronically absent.
2. Any known case of haemoglobinopathy

Methodology

- After taking clearance from Institutional Ethical Committee, the study subjects fulfilling the inclusion criteria were recruited and the methodology explained.
- After taking written consent for the study, the proforma was administered to collect data on socio-demographic profile, medical history and clinical examination was done.
- All the study subjects were screened for anaemia by using CBC analyser.
- According to WHO criteria (Hb <13 gm/dl in males and Hb <12 gm/dl in females), the study subjects are classified as anaemic or normal.

- Data was entered in MS excel and data was analysed using EPI INFO version 7.2.2.6.
- Socio-demographic data was analysed using percentages and descriptive statistics. Association between various variables and anaemia was analysed using chi-square test. Quantitative data was compared between anaemic and non-anaemic subjects using student T test.

Results

a. Socio-demographic profile:

Age of the study subjects was 18.51 ± 0.80 years. Among the 98 study subjects, 56 (57.14%) were females and 42 (42.86%) were males. Weight, height and BMI of study subjects were 66.19 ± 14.06 Kg, 165.1 ± 10.03 cm and 24.23 ± 4.38 respectively (Table 1).

b. Prevalence of anaemia:

The study subjects were classified based on WHO criteria i.e., Hb <12 g/dl among females and Hb <13 g/dl among males. Anaemia was seen in 11 (11.22%) of the study subjects. Mean haemoglobin was 14.22 ± 2.03 g/dl.

c. Symptoms and signs of anaemia among the study subject:

Hair fall (30.61%) was the commonest symptom among study subjects followed by lack of concentration (13.27%). Pallor was seen in 15.31% of study subjects (Table 2)

d. Association between various socio-demographic variables and anaemia

Anaemia was common in females compared to males, more in urban subjects compared to rural subjects, more among vegetarians compared to non-vegetarians. Anaemia was more among subjects who consumed less fruits and vegetables. There was a statistically significant association between anaemia and sex, type of diet, consumption fruits, and presence of pallor. There was a significant difference in haemoglobin and haematocrit between anaemic and non-anaemic subjects (Table 3).

Table 1: Socio-demographic profile of the study subjects

Characteristics		N=98
Sex	Female	56 (57.14)
	Male	42 (42.86)
Domicile	Rural	18 (18.37)
	Urban	80 (81.63)
Diet	Mixed	84 (85.71)
	Vegetarian	14 (14.29)
BMI	Normal	32 (32.65)
	Underweight	8 (8.16)
	Overweight	27 (27.55)
	Obese I	17 (17.35)
	Obese II	14 (14.29)

Table 2: Distribution of study subjects based on symptoms and signs of anaemia

Characteristics	Number (N=98)*
Decreased appetite	4 (4.08)
Palpitation	2 (2.04)
Easy fatigability	1 (1.02)
Hair fall	30 (30.61)
Excessive menstrual flow	4 (4.08)
Lack of concentration	13 (13.27)
Pallor	15 (15.31)
Bald tongue	7 (7.14)

Figures in the parentheses *Multiple responses

Table 3: Association between anaemia and various socio-demographic factors

Characteristics		Anaemic	Not anaemic	χ^2	p-value
Sex	Male	1 (2.38)	41 (97.62)	5.701	<0.01
	Female	10 (17.86)	46 (82.14)		
Domicile	Rural	-	18 (100.0)	2.75	0.09
	Urban	11 (13.75)	69 (86.25)		
Diet	Mixed	6 (7.14)	78 (92.86)	9.73	<0.01
	Vegetarian	5 (35.71)	9 (64.29)		
Consumption of vegetables	<3times a week	4 (11.11)	32 (88.89)	0.007	0.97
	>3times a week	7 (11.29)	55 (88.71)		
Consumption of fruits	<3times a week	8 (18.18)	36 (81.82)	3.83	<0.05
	>3times a week	3 (5.56)	51 (94.44)		
Consumption of junk food	<3times a week	6 (12.50)	42 (87.50)	0.15	0.69
	>3times a week	5 (10.00)	45 (90.00)		
Pallor	Present	4 (26.67)	11 (73.33)	4.19	<0.05
	Absent	7 (8.43)	76 (91.57)		
Age		18.54±0.68	18.50±0.82	0.88	
Weight		69.72±12.57	65.74±14.24	0.37	
Height		167.36±11.53	164.81±9.86	0.43	
BMI		24.96±4.27	24.14±4.41	0.56	
Haemoglobin		11.22±0.81	14.60±1.82	<0.001	
Haematocrit		30.63±2.49	39.44±5.19	<0.001	
WBC count		8863.6±2868.5	9173.6±2217.3	0.67	
Neutrophil%		53.33±5.41	57.69±7.70	0.07	
Lymphocyte%		38.71±4.18	34.84±7.41	0.09	
Monocyte%		7.95±3.01	7.52±1.67	0.47	
Platelet		307.54±124.9	283.98±63.93	0.31	

Discussion

In the present study, age of the study subjects was 18.51±0.80years. In similar study by Subramaniyan K⁶ et al., age was 19.41±2.78yrs.

In the present study, 56 (57.14%) were females and 42 (42.86%) were males. In study by Subramaniyan K⁶ et al., 79.1% were females.

In the present study, anaemia was seen in 11 (11.22%) of the study subjects. All the subjects had mild anaemia. Similar studies done in different parts of India by Abilash Sasidharannair Chandrakumari⁷ et al., P.M. Siva⁸ et al., Subramaniyan K⁶ et al., Bhuvaneshwari Kannan⁹ et al., Anil Kumar¹⁰ et al., anaemia was seen in 48.63%, 21%, 43%, 8%, 43% and 39.1% respectively.

In the present study, there was a statistically significant association between anaemia and sex, type of diet, consumption fruits, and presence of pallor, haemoglobin and haematocrit. In another study by Bhuvaneshwari Kannan⁹ et al., there was an association between anaemia and symptoms of anemia and BMI. In another study by Saratha A¹¹ et al., there was an association between anaemia and consumption of green leafy vegetables, history of passing worms. In a study by Subramaniyan K⁶ et al., there was an association between anaemia and sex of subjects, bleeding disorder, haemoglobin, WBC, RBC, platelet, haematocrit. In a study by P.M. Siva⁸ et al., there was an association between anaemia and haematocrit, jiggery intake, hand washing after toileting & after food intake. In a study by Sanjeev M Chaudhary¹² et al., there was an association between anaemia and socio-economic status, mother's and father's education, mean weight and height. In a study by Premalatha T¹³ et al., there was an association between anaemia and type of family, palpitation, intake of non-vegetarian food & fruits, weight, mother's literacy.

Conclusion

In the present study, anaemia was seen in 11 (11.22%) of the study subjects. There was a statistically significant association between anaemia and sex, type of diet, consumption fruits, and presence of pallor. Socio economic factors have a significant role in occurrence of anaemia which later manifests itself as poor performance. Inculcating healthy food habits will prevent occurrence of anaemia.

Ethical Clearance- Taken from Institutional ethical committee of Sri Siddhartha Medical College, Tumkur,

Karnataka

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Conflict of Interest - Nil

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