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Saratha A

Singh Z

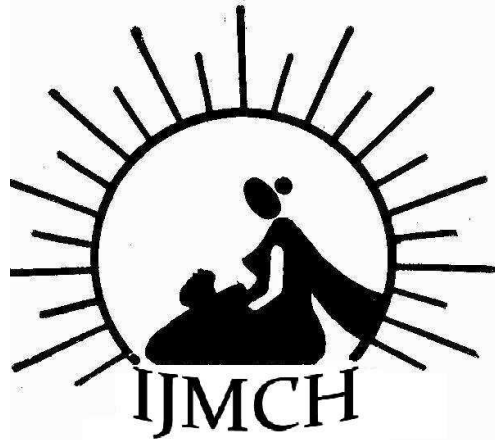
Datta SS

Boratne AV

Senthilvel V

Joice S

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What is the prevalence of anaemia among young adult female medical and nursing students and strategies required for intervention?

Prevalence of Anaemia among Young Adult Female Students in a Medical Teaching Institution in Pondicherry

Saratha A*, Singh Z**, Datta SS***, Boratne AV***, Senthilvel V**** and Joice S*****

*Second year MBBS student, **Professor and Head, ***Assistant Professor,

****Assistant Professor (Biostatistics), *****Post graduate student

Department of Community Medicine, Pondicherry Institute of Medical Sciences, Pondicherry-605014, India

Correspondence: Dr. Shib Sekhar Datta

E-mail: drshibsekhar.datta@rediffmail.com

ABSTRACT

Research question: What is the prevalence of anaemia among young adult female medical and nursing students and strategies required for intervention?

Methodology: A cross-sectional medical institution based study was carried out between May-July 2009. Information about background characteristics, anthropometric parameters and menstrual history was obtained. Haemoglobin level was measured by Sahli's method and diet history was taken by 24-hour recall method.

Results: Out of total 300 medical and nursing students 228 (76%) were anaemic, 170 (56.67%) had mild and 58 (19.33%) had moderate anaemia. 157 (89.71%) students who did not consume green leafy vegetable regularly were anaemic. 97 (32.33%) students gave history of passing worms in stool. Association between anaemia and increasing age, increasing academic year, consumption of non-green leafy vegetable and passage of worms in stool was significant. No significant association could be found between anaemia and consumption of veg/non-veg foods, history of chronic illness, type and duration of menstrual cycle. There was also no significant association between anaemia with height, weight and BMI.

Conclusion: Prevalence of mild to moderate anaemia among young adult female medical and nursing students is high. A concerted effort is needed for dietary modification, deworming and iron supplementation for correction of anaemia.

Key words: Anaemia, young adult female students

INTRODUCTION

Nutritional anemia though global in occurrence, is more of concern in the developing countries because of the high prevalence in these regions.⁽¹⁾ Iron deficiency anemia in the adolescent girls is a significant risk factor for maternal mortality, high incidence of low-birth weight babies, high perinatal mortality and fetal wastage, which ultimately results in higher fertility rates.⁽²⁾ Adolescence, a period of transition between childhood and adulthood, occupies crucial position in the life of human beings.⁽³⁾ Adolescence is second to infancy, as the period of most rapid growth. During this period with inadequate and improper dietary habits, one is vulnerable to all kinds of nutritional morbidities. Adolescence is considered most appropriate time to intervene, and behavior change messages embraced by this group can contribute to sustained health impacts.

India has high prevalence of iron-deficiency anemia among women. Between 60-70% adolescent girls are anemic, a condition that can result in adverse pregnancy outcomes or even maternal death, as well as reduced work productivity and impaired physical capabilities.⁽⁴⁾ The principal cause of iron deficiency anemia in premenopausal women is blood lost during menses.⁽⁵⁾ The other causes of anemia are insufficient iron in the diet, malaria, intestinal worms, and HIV/AIDS. Chronic anemia may result in reduced scholastic performance in adolescents. So the present study was planned to ascertain the prevalence of anemia among young adult female medical and nursing students and to suggest intervention strategies.

MATERIAL AND METHODS

A cross-sectional medical institution based study was carried out between May-July 2009. The study subjects were 300 young adult female medical and nursing students between 16-24 years age (150 each from MBBS and college of nursing). A pre-designed and pre-tested self administered questionnaire interview method was used after obtaining informed consent. Information on background characteristics, anthropometric parameters and menstrual history was obtained. Classification of BMI for Indians⁽⁶⁾ and grading of anaemia⁽²⁾ was followed as per WHO guidelines. Haemoglobin level was measured by experienced laboratory technician using Sahli's method and diet history was obtained by 24-hour recall method.

Data was entered and analysed using Epi_info Version 6.04 and SPSS version 16.0. The Chi-square test was used for testing statistical significance. The level of significance was taken at p-value < 0.05. Ethical permission was taken from Institutional Ethical Committee and the study was guided as per ICMR protocol. All young adult female students found to be anaemic were counselled for care of anaemia.

RESULTS

Majority (64.33%) belonged to age group of 20-23 years followed by 16-19 years (32.67%). Association of anemia with increasing age was statistically significant (p value 0.047). 77 (84.61%) students were anemic during third year of their studies compared to 41 (57.75%)

in first year. Association between anaemia and year of study was statistically highly significant (p value 0.0005). (Table I)

Table I: Background information of Young Adult Female Medical Students

Indicators	Total (n = 300)	Anaemic (n = 228)	Non-anaemic (n = 72)	p value
Age group (years)				
16 - 19	98 (32.67)	82 (83.67)	16 (16.33)	0.047
20 - 23	193 (64.33)	138 (71.50)	55 (28.50)	
More than 23	9 (3)	8 (88.88)	1 (11.12)	
Type of course				
MBBS	150 (50)	120 (80)	30 (20)	0.105
Nursing	150 (50)	108 (72)	42 (28)	
Year of study				
Less than 1 year	71 (23.67)	41 (57.75)	30 (42.25)	0.00049
1 - 2 years	51(17)	41 (80.39)	10 (19.61)	
2 - 3 years	91(30.33)	77 (84.61)	14 (15.39)	
More than 3 years	87 (29)	69 (79.31)	18 (20.69)	

(Figures in parenthesis indicate percentage)

Table II: Anaemia status of Young Adult Female Medical Students

Indicator	No. of students (%)
Non anaemic (Hb level \geq 12 gm/dL)	72 (24)
Grade I (mild) anaemia (Hb level 10.0-11.9 gm/dL)	170 (56.67)
Grade II (moderate) anaemia (Hb level 7.0-9.9 gm/dL)	58 (19.33)
Grade III (severe) anaemia (Hb level less than 7 gm/dL)	0 (0)
Total	300 (100)

Out of 300 female students, 228 (76%) were anaemic; 170 (56.67%) had grade 1 (mild) anemia (Hb% 10.0-11.9 gm/dL), and 58 (19.33%) had Grade 2 (moderate) anemia (Hb% 7.0-9.9 gm/dL). None of the girls had Grade 3 (severe) anemia (Hb% less than 7.0 gm/dL). (Table II)

Table III: History of Dietary habit, Morbidity, Menstrual cycle and Status of Anaemia among Young Adult Female Medical Students

Indicators	Total (n = 300)	Anaemic (n = 228)	Non-anaemic (n = 72)	p value
Non-vegetarian				
Yes	143 (47.67)	105 (73.43)	38 (26.57)	0.319
No	157 (52.33)	123 (78.34)	34 (21.66)	
Consume green leafy vegetables				
Yes	125 (41.67)	71 (56.8)	54 (43.2)	0.001
No	175 (58.33)	157 (89.71)	18 (10.29)	
Past history of chronic illness				
Yes	27 (9)	24 (88.88)	3 (11.12)	0.1
No	273 (91)	204 (74.72)	69 (25.28)	
History of passing worms				
Yes	97 (32.33)	94 (96.91)	3 (3.09)	0.001
No	203 (67.67)	134 (66.01)	69 (33.99)	
Type of menstrual cycle				
Regular	266 (88.7)	203 (76.32)	63 (23.68)	0.88
Irregular	34 (11.3)	25 (73.52)	9 (26.48)	
Duration of menstrual cycle				
Less than 2 days	1(0.33)	1 (100)	0 (0)	0.784
2 - 4 days	128 (42.67)	97 (75.78)	31 (24.22)	
5 - 7 days	169 (56.33)	129 (76.33)	40 (23.67)	
More than 7 days	2 (0.66)	1 (50)	1 (50)	

(Figures in parenthesis indicate percentage)

Prevalence of anaemia among vegetarian and non-vegetarian students was 73.43% and 78.34% respectively. 157 (89.71%) students were anaemic who do not consume green leafy vegetable regularly. 27 (9%) students had suffered from one or other chronic illness. Almost one-third (32.33%) students gave history of passing worms in stool. Among them, 94 (96.91%) were anaemic compared to 134 (66.01%) who do not pass worms in stool. Association of anemia with consumption of non-green leafy vegetables and passage of worms in stool was significant (p value 0.001). There was no significant association between anaemia and veg/non-veg food and history of chronic illness.

266 (88.7%) girls had regular menstrual cycle. Out of 34 (11.3%) girls who had irregular menstrual cycle, 25 (73.52%) had anemia. Majority of girls had menstrual cycle lasting for 5-

7 days (56.33%) and 2-4 days (42.66%). However, association of anemia with type and duration of menstrual cycle was not significant. (Table III)

The prevalence of anaemia among young adult female medical students has no significant association of anemia with height, weight or BMI. (Table IV)

Table IV: Height, Weight, BMI and status of Anaemia among Young Adult Female Medical Students

Indicators	Total (n = 300)	Anaemic (n = 228)	Non-anaemic (n = 72)	p value
Height (cms) distribution				
Upto 145	11(3.67)	9 (81.82)	2 (18.18)	0.875
146 - 155	122 (40.67)	93 (76.23)	29 (23.77)	
156 - 165	140 (46.66)	107 (76.43)	33 (23.57)	
≥ 166	27 (9)	19 (70.37)	8 (29.63)	
Weight (Kgs) distribution				
Upto 45	49 (16.33)	37 (75.51)	12 (24.49)	0.476
46 - 55	139 (46.33)	109 (78.42)	30 (21.58)	
56 - 65	77 (25.67)	59 (76.62)	18 (23.38)	
≥ 66	35 (11.67)	23 (65.71)	12 (34.29)	
Distribution of BMI (Kg/m²)				
Thin (< 18.5)	37 (12.33)	26 (70.27)	11 (29.73)	0.769
Normal (18.5 - 22.99)	164 (54.67)	127 (77.44)	37 (22.56)	
Overweight (23 - 24.99)	50 (16.67)	39 (78)	11 (22)	
Obese (≥ 25)	49 (16.33)	36 (73.47)	13 (26.53)	

(Figures in parenthesis indicate percentage)

DISCUSSION

The prevalence of anemia among young adult female medical and nursing students in our study was 76%. This corresponds to an ICMR study by Toteja GS and Singh P⁽⁷⁾ who obtained data from 16 districts of 11 states through District Nutrition projects, where prevalence of anemia among adolescent girls has been found to be as high as 90.1%. Similarly, studies on prevalence of anemia from different states of rural India, reported high prevalence of anemia from 46-98%.⁽⁸⁻¹⁰⁾ Sharda Sindu⁽¹¹⁾ in a study carried out among 265 adolescent girls of Amritsar in 2005 also discovered high prevalence (70-75%) of anemia including 12.83% girls who had severe anemia. Considering this, all young adult female students should be

appraised about high prevalence of anaemia and regular checking of haemoglobin level should be ensured among them. Studies have also reported successful management of anaemia with weekly iron supplementation to adolescent girls which could also be tried out.^(12,13)

With increasing age in the professional course there was increase in the prevalence of anaemia among students which also corresponds with the year of study. This may be related to dietary habits of students and/or quality of food served in the hostels as most of the students reside in institution hostels. No statistical significance could be associated between anemia and type or duration of menstrual cycle, which is considered to be major cause of anaemia among young adult girls.⁽⁵⁾ Similarly, no statistical significance was associated between dietary pattern (veg/non-veg) and prevalence of anemia. This could be possibly due to the fact that dietary history was obtained by 24 hours recall method and was not adequate to bring out the true association between dietary intake and prevalence of anemia. However, prevalence of anaemia had significant statistical association between consumption of non-green leafy vegetables and passage of worms in stool. Kaur M *et al*⁽¹⁴⁾ from their study have well documented the role of green leafy vegetables in anaemia prevention among adolescent girls. So, emphasis on consumption of green leafy vegetables regularly for prevention of anaemia should be carried out in medical institutions. However, Olsen *et al*, have documented failure of twice weekly iron supplementation in western Kenya, where worm infestation was one of the predictors,⁽¹⁵⁾ which emphasises need for deworming to combat anaemia especially in presence of high prevalence of worm infestation. Association of anaemia with variation of height, weight and BMI was not significant.

CONCLUSION

Prevalence of anemia among young adult female medical and nursing students was found to be 76% with 56.67% mild and 19.33% having moderate anemia. Association of anemia with increasing age group and year of study was significant. No significant association between anemia with type or duration of menstrual cycle could be observed. 89.71% students who do not consume green leafy vegetables were anaemic. Almost one-third students gave history of passing worms in stool. Association of anemia with consumption of non-green leafy vegetables and passage of worms in stool was significant. There was no significant association of anemia with height, weight or BMI.

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