Volume-4, Issue-5, May-2015 • ISSN No 2277 - 8160

Research Paper | Medical Science

Prevalence of Anemia among undergraduate medical students of Central India

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ABSTRACT

Anemia remains a public health challenge worldwide. Iron deficiency is the most common cause of anemia in adolescents, college students and is of continuing concern in developing countries like India. The present study aimed to estimate the prevalence of anemia among medical college students and to study socio-demographic factors responsible for causing anemia. We conducted a cross sectional study in 100 medical undergraduate students from 1st May to 20th July 2014. Detailed history regarding sociodemographic profile, dietary history by 24 hr recall method, and anthropometric measurements like height, weight, waist and hip circumference were estimated. Hemoglobin was estimated by Sahli's Haemoglobinometer method. The mean parameter values like age, haemoglobin, BMI and waist hip ratio (WHR) were comparable in males and females. The overall prevalence of anaemia was found to be 39% with preponderance among female students (56%) as compared to male students (22%). Males as well as females belonging to hindu religion having low socio-economic status hailing from urban areas and involved in moderate physical activity work had higher prevalence of anaemia.

KEYWORDS : Anaemia, medical student, socio-demograhic profile, prevalence

Introduction

Iron deficiency anemia is still one of the major public health problems all over the world and cuts across all the sections of the population. It has been estimated that approximately 50% of anemia is caused by iron deficiency. Particularly in developing countries like India, the complete ecological picture is not well established.[1, 2]

Iron deficiency, even in the absence of anaemia, is known to limit physical and mental functions and may impair intellectual performance in adolescents and college students.[3] The cognitive functions in adults can be altered by a number of diseases, nutritional deficiencies, hormonal changes, ageing and drugs. Anaemia, through various possible mechanisms, has been suggested to result in a cognitive deterioration.[4] Adolescent being formative years in life are more susceptible to nutritional anemia. Considerable changes in growth pattern, lifestyle, dietary habits & behavior are likely to influence the hemoglobin levels among male and females of high income group.[5]

Adolescent girls are at high risk of developing iron deficiency because of increased iron demands during puberty, menstrual losses, and limited dietary iron intake.[6]

Very few studies have been conducted on anemia among medical college students. Screening for the prevalence of anemia is important both for identifying populations at risk and determining the appropriate treatment for individual patients.[7, 8] With this background, the present study was planned to highlight the problem of anemia in undergraduate medical college students and to study socio-demographic factors related to anemia.

Material and Methods:

A cross sectional study was carried out in 100 undergraduate medical students (First and second MBBS) students from Indira Gandhi Medical College (IGGMC), Nagpur.

The study period was from 1st May to 30th July 2014. The structured questionnaire was designed to seek the information related to socio-demographic profile like age, gender, residence, education, religion, socio-economic status, type of family, type of diet and physical activity after obtaining written informed consent from the study subjects. Socio-economic status (SES) was estimated according to a modified Kuppuswamy's scale. The total number of members in the family constituted the 'family size'.

Also, medicos were subjected to anthropometric measurements like height, weight, waist circumference and hip circumference. Hemoglobin estimation of all the study subjects was done by Sahli's Haemoglobinometer method. On similar lines Body Mass Index (BMI) was determined for all subjects by weight in kilograms divided by the square of the height in metres (kg/m^2).[9] Moreover, thorough general and systemic examination of the study subjects was done.

The study was approved by Institutional Ethics Committee (IEC).

The collected data was analyzed statistically by using Percentages, chi square test trend, Z test using Open Epi Info statistical package programme version 2.3 year 2009. Statistical significance was assessed at a type I error rate of 0.05.

Results:

Table 1 shows the mean parameter values amongst study subjects. It was observed that the mean age, haemoglobin and waist hip ratio (WHR) was slightly greater n male medical students as compared to females except body mass index (BMI) which was slightly higher in females. However, no statistically significant difference was found among them ($p>0.05$) afer applying Z test. So both the groups are comparable.

The overall prevalence of anaemia in our study was found to be 39%; prevalence being higher among female students (56%) as compared to male students (22%). Mild anaemia was noted in 44% females and 20% males. Whereas moderate anaemia was observed in 2% males and 12% females. None of the subjects had severe anaemia. 78% females & 44% males had haemoglobin values in the normal range as shown in Table 2.

Considering the socio-demographic correlates of the study subjects with anaemia, it was seen that majority of medical students (79.5%) with anaemia belonged to low socio-economic status, whereas only 20.5% belonged to high socio-economic status. Maximum anaemic subjects were Hindus (84.6%) followed by Bhudhist (7.7%), Muslims (5.1%) and least were Christians (2.6%). As far as residence is concerned, 100 % medicos hailing from urban areas and had involved in moderate physical activity. It was also observed that 59% anaemic subjects subsisted on mixed diet and 41% on pure vegeterian diet. These findings are depicted in Table 3.

Discussion:

We highlighted the problem of anemia in undergraduate medical college students and socio-demographic factors related to anemia. The overall prevalence of anemia was found to be quite high (i.e. 39 %) in our study. These findings are consistent with the studies done by other authors CMS Rawat *et al.*[10] at Meerut, J Rajaratnam *et al* [11] in Tamil Nadu and Toteja GS *et al.*[12] who found 90.1% prevalence of anemia among adolescent girls from 16 districts of India, with 7.1% having severe anemia.

Our study also showed a significant association of anemia with low socio-economic status which may be due to the availability of high quality food with better socio-economic status. None of the subjects had severe anemia. Bulliyy *et al.* [13] found 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. They found significant association between Haemoglobin concentration and the educational level of girls, their parents' family income, and body mass index. In the present study, mean age, haemoglobin and waist hip ratio (WHR) was slightly greater in male medical students as compared to females except body mass index (BMI) which was slightly higher in females. Nutritional anemia and under nutrition exist among female medical students who are literate, and have free access to the nutritive diet in a good healthy environment. The results showed that anemia constitutes a health problem among female Medical students and most of the detected anemia was with mild severity. Also living in the hostel away from parents and families was reflected upon their diet habits and had a significant reflection upon the prevalence of anemia among the studied group. This warrants further study on a larger sample of healthy medical college students to validate these findings and eventually encourage the development of directed educational and nutritional programs to safeguard the health of these future mothers. A significant association of anemia with low socio-economic status also suggests a need to develop strategies for intensive adult 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.

Conclusions

Our study revealed quite high prevalence of anaemia (39%) among undergraduate medical students especially girls (56%) as compared to boys (22%). Male as well as female medical students belonging to hindu religion having low socio-economic status hailing from urban areas and involved in moderate physical activity work were found to have high prevalence of anaemia as compared to students belonging to high socoeconomc status.

Table 1: Mean Parameter values amongst study subjects

Parameters	Males	Females	Z test P value
Age	19.6 ± 1.11	19.5 ± 1.08	>0.05
Haemoglobin	12.13 ± 2.01	11.92 ± 1.72	>0.05
Body mass index (BMI)	20.83 ± 3.20	20.93 ± 3.05	>0.05
Waist Hip ratio (WHR)	0.82 ± 0.07	0.81 ± 0.08	>0.05

Table 2: Distribution of study subjects according to grades of Anaemia

Grades of Anaemia	Males (N = 50)	Females (N = 50)
Normal haemoglobin	39 (78)	22 (44)
Mild	10 (20)	22 (44)
Moderate	1 (2)	6 (12)
Severe	0	0

Figures in parentheses indicate percentage.

Table 3: Socio-demographic correlates of anaemia in study subjects

Correlate	Total Number of subjects (N = 100)	No. of subjects with anaemia (n = 39)
Socio-economic status		
Upper	19	8 (20.5)
Lower	81	31 (79.5)
Religion		
Hindu	87	33 (84.6)
Muslim	7	2 (5.1)
Christian	2	1 (2.6)
Buddhist	4	3 (7.7)
Residence		
Urban	80	39 (100)
Rural	20	0
Physical activity		
Heavy	6	0
Moderate	90	39 (100)
Sedentary	4	0
Type of Diet		
Vegeterian	33	16 (41)
Mixed	67	23 (59)

Figures in parentheses indicate percentage.

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