

Prevalence of Anemia and Use of Iron Supplements in MBBS Students of CMH Lahore Medical College

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ABSTRACT

Background: Iron deficiency anemia afflicts masses of all ages, worldwide. The disease tends to be prominent in the adolescence, students being more vulnerable due to their dynamic lifestyle, dietary habits and demanding growth spurt. Use of iron supplements can greatly reduce the burden of disease and associated morbidity. The objective of this study was to estimate the prevalence of anemia and use of iron supplements in MBBS students of CMH Medical College, Lahore.

Methods: A cross sectional study was conducted in CMH Medical College, Lahore. A predesigned questionnaire was used to obtain information regarding use of iron supplements. Afterwards, hemoglobin level was measured using conventional Sahli's method. The collected data was analyzed with SPSS 25 software. Results with p value < 0.05 were taken as significant.

Results: Mean hemoglobin level was found to be 14.3±1.3 g/dL in males and 11.6±1.4 g/dL in females. Prevalence of anemia was found to be 38.7%. Anemia was found to be more prevalent in female students (57.8%) as compared to the male students (14.9%). Difference between prevalence of anemia in hostellites and day scholars was not found to be statistically significant (p = 0.17). Frequency of anemia was observed to be significantly higher in students who did not use oral iron supplements (p=0.03).

Conclusion: Iron deficiency anemia is more common in female students than male students, of CMH Medical College Lahore. Majority of the anemic students do not take oral iron supplements. There is no difference in the prevalence of anemia among hostellites and day scholars.

MeSH words: anemia, hemoglobin, iron supplements

INTRODUCTION

Anemia is a disorder characterized by a decrease in the number of red blood cells in the body. This leads to altered red blood cells morphology and a consequent decrease in the hemoglobin levels in the blood. Despite the fact that anemia is pathophysiologically diverse and has numerous causes, iron deficiency remains the most common one¹.

According to the Global Burden of Disease Study 2016, iron deficiency anemia is one of the top five causes of years lived with disease burden, and the leading cause in women.² This nutritional deficiency affects not only the developing countries, but also has major consequences for the developed world. In fact, around 1.24 billion individuals in the world experience iron deficiency anemia³.

Iron deficiency in the body can lead to anemia, and a horde of other symptoms independent of anemia including chronic fatigue, diminished well-being and impaired cognitive function. In most cases, total body iron deficiency is caused by increased physiological requirements, combined with reduced iron intake in: children, adolescents, young adults in addition to pregnant women. Chronic blood loss and defective iron absorption augment this deficit.⁴ In developing countries, iron deficiency, and consequent anemia, is also associated with infections that

cause hemorrhages, for instance, schistosomiasis and hookworm infestation⁵.

During the rapid growth period of adolescence, the physical and the physiological demands of the body increase. The nutritional requirements of this age group make them more vulnerable to anemia. In girls, the incidence of iron deficiency starts at the onset of puberty and is exacerbated later on by menstruation. In female medical students, especially those living in dorms, there is increased preponderance of anemia due to poor eating habits, long schedule, burden of medical studies and habit of skipping breakfast.⁶

The mainstay of treatment for iron-deficiency anemia is oral iron replacement. Despite widespread availability and low cost, intolerance and poor compliance play a major role in failure of therapy.⁷ Medical students, in spite of having better knowledge about health and better access to health care facilities, follow the same trends.

Iron deficiency, even in the absence of anemia, is known to limit physical and mental functions and may impair intellectual performance in adolescents and college students. Therefore, it is extremely important to emphasize on proper iron supplementation and dietary modification in order to replete iron stores and treat anemia, especially in medical students who require adequate iron levels for optimal cognitive ability as well as prevention of anemia⁸.

The objective of this study was to estimate the prevalence of anemia among MBBS students of CMH

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Medical College, Lahore and to find out any relationship of anemia with their accommodation status and use of iron supplementation.

METHODOLOGY

A cross sectional study was conducted in CMH Medical College, Lahore from Jan 2021 to Mar 2021, over a period of 45 days. The study was commenced after seeking approval by the ethical committee of CMH Lahore Medical College (ERC no. 506/ERC/CMH/LMC). The sample size was calculated to be 149, based on the prevalence of anemia of 46% in the referral study^{9,10}, with 95% confidence level and 8% absolute precision⁸. After informed verbal and written consent, 150 students were enrolled in the study. Students with any chronic disease were excluded. A predesigned questionnaire, adapted from similar studies^{6,11} was used as data collection tool. The validity and reliability of the questionnaire had already been established by Adznam *et al* through pilot study as well as calculation of Cronbach's alpha (0.72) and Kuder-Richardson Formula 20 -KR20 (0.80)¹¹.

On the day of data collection, all the students were gathered at one place in laboratory premises. Students were asked about their sociodemographic data and use of oral iron supplements. Each student, after completion of the questionnaire, underwent hemoglobin level estimation by Sahli's method^{9,12}. For this purpose, complete aseptic technique was adopted by the laboratory assistant, under supervision of senior faculty, in order to avoid any adverse

effect. Respondents were assured with regard to confidentiality of the data. Operation definition for diagnosis of anemia, in accord with WHO¹³, were as follows;

Female students: Hemoglobin < 12 g/dl

Male students: Hemoglobin < 13 g/dl

The data collected was analyzed using SPSS version 25. Descriptive statistics was presented as mean \pm SD for quantitative variables and frequency and percentages for qualitative variables. Fischer's exact test was applied to test the significance of difference between categorical variables. A p value < 0.05 was considered significant.

RESULTS

Out of 150 participants, 67(44.7%) were males and 83(55.3%) were females. Mean hemoglobin level was found to be 14.3 \pm 1.3 g/dL in males and 11.6 \pm 1.4 g/dL in females. Prevalence of anemia was found to be 38.7%. Out of 67 male students, 10 (14.9 %) students were anemic, while out of 83 female students, 48(57.8%) were observed to have anemia. Frequency of anemia in both genders, with respect to accommodation, is shown in Table 1. Fischer's exact test showed that the difference between prevalence of anemia in hostellites and day scholars was not significant (p = 0.17). Frequency of anemia in both genders, in relation to the use of iron supplements, is shown in Table 2. The difference between the groups, in relation to the use of iron supplements, was statistically significant (p = 0.03).

Table 1: Frequency of anemia in MBBS students of CMH Medical College, Lahore, according to accommodation status (n=150)

Gender			Anemia		Total
			Yes	No	
Male	Accommodation	Hostellite	7	38	45
		Day scholar	3	19	22
	Total		10	57	67
Female	Accommodation	Hostellite	36	22	58
		Day scholar	12	13	25
	Total		48	35	83
Total	Accommodation	Hostellite	43	60	103
		Day scholar	15	32	47
	Total		58	92	150

Table 2: Frequency of anemia in MBBS students of CMH Medical College, Lahore, according to use of iron supplements (n=150)

Gender			Anemia		Total
			Yes	No	
Male	H/O oral iron	Yes	2	7	9
		No	6	49	55
		Maybe	2	1	3
	Total		10	57	67
Female	H/O oral iron	Yes	9	5	14
		No	37	28	65
		Maybe	2	2	4
	Total		48	35	83
Total	H/O oral iron	Yes	11	12	23
		No	43	77	120
		Maybe	4	3	7
	Total		58	92	150

DISCUSSION

Iron deficiency anemia is one of the most common, albeit, treatable form of anemia. It manifests as fatigue, pallor,

dyspnea, headaches, and pica. Decreased iron levels in brain can present as cognitive dysfunction, irritability and lack of concentration. The treatment options for iron-

deficiency anemia include oral and parenteral iron replacement¹⁴.

This study was designed to estimate the prevalence of anemia among MBBS students of CMH Medical College, Lahore and to find out any relationship of anemia with their accommodation status and use of oral iron supplementation.

In the present study, the prevalence of anemia was found to be 38.7%, with female predominance (57.8% vs 14.9%). Similar prevalence of anemia (37.8%) was shown in a study conducted by Timilsina *et al* at a medical college in Nepal¹⁵. In another study done by Khakurel *et al.*, 43.5% undergraduate medical students were found to be anemic¹⁶. Similarly, prevalence of anemia was documented to be 45% in a study conducted on medical undergraduates in India¹⁷.

Mean hemoglobin level was found to be 14.3 ± 1.3 g/dL in males and 11.6 ± 1.4 g/dL in females. This finding is supported by study done by Khakurel *et al*, in which mean hemoglobin was 13.4 ± 1.70 g/dL in boys, and 11.7 ± 1.15 g/dL in girls.¹⁶ Similar results were shown in two different studies conducted in India^{18,19}. The statistically low mean hemoglobin in females can be attributed to additional blood loss due to menstruation, which is often not compensated by diet alone.

In this study, difference between prevalence of anemia in hostellites and day scholars was not found to be statistically significant ($p=0.17$). Similar results were observed in the study done by Javed *et al* ($p = 0.82$)¹⁷. Contrary to this, work done by Javed *et al.* showed significantly high frequency of anemia in hostellites, as compared to day scholars ($p = 0.015$)⁶. Poor dietary habits pose an alarming health concern amongst university students. Skipping breakfast and meals, avoiding healthy diet and excessive fastfood consumption predisposes them to dietary deficiencies. Medical students seem to be following the same trend, despite having better knowledge about nutrition and health.

Frequency of anemia was observed to be significantly higher in students who did not use oral iron supplements ($p=0.03$). Oral iron supplementation is the primary treatment option in iron deficiency anemia. Despite low cost and widespread availability, oral iron supplements are not used by population masses. Medical students are no exception. Despite having knowledge and awareness, students are reluctant to use nutritional supplements in routine. One of the major reasons for limited use of iron tablets is the associated gastric intolerance, which often leads to poor compliance²⁰. This can be markedly reduced by changing the oral formulation and taking iron supplements with meals. Therefore, medical students, especially females, should undergo regular medical testing to rule out nutritional anemia, and adhere to use of iron supplements, if required.

This study has a few limitations. Firstly, it a convenient sample was taken from only one medical college, due to limited access. A study with a larger sample size would more accurately predict the results. Secondly, severity of anemia, RBS indices and morphological classification could not be done due to scarcity of resources.

CONCLUSION

Iron deficiency anemia is more common in female students than male students, of CMH Medical College Lahore. Majority of the anemic students do not take oral iron supplements. There is no difference in the prevalence of anemia among hostellites and day scholars.

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