A Retrospective Study to Estimate the Prevalence of Anemia and Associated Factors among First Year MBBS Students of Maharaja Agrasen Medical College, Agroha, Hisar

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ABSTRACT

Introduction: Anemia is a most common public health problem affecting around 1.9 billion population of the world. It is a severe public health problem in India. Medical students are vulnerable to develop anemia due to irregular eating habits due to hectic study schedule. Anemia among this age group has significant health consequences resulting in poor cognition, decreased attention span and memory affecting the performance, depressed immunity, repeated infections, increased fatigue, and shortness of breath, dizziness, blurred vision, low endurance and irregular menstruation.

Material and Methods: This study is conducted among 100 students of both gender taking admission in MBBS first year at MAMC, Agroha. Hemoglobin values and other relevant details of the students were taken from academic section submitted at time of admission. World Health Organization criteria were taken to determine the severity of anemia. Modified B.G. Prasad scale was used to assess the socio-economic status of the family. Data was first entered into MS excel sheet and then was exported to SPSS version 20.0 for appropriate analysis.

Results: Prevalence of anemia came out to be 54% among study subjects. Difference between the mean levels of hemoglobin across the genders came out be statistically significant (P=<0.001).

Conclusion: Prevalence of anemia is high among the study subjects with more prevalence among females study subjects. There is a need to accelerate efforts for achieving control of anemia by strengthening multi-sectoral partnership involving government departments, academic institutions, bilateral agencies and food industry.

Keywords: Prevalence of Anemia among MBBS Students, First year MBBS Students.

INTRODUCTION

The word "anemia" is derived from the Greek word which means 'an' – "without" and 'haima' – "blood". Anemia is also referred as "Padu Rog" meaning disease with pallor.[1] Iron formulations were prescribed for treatment of anemia in Ayurveda.[2] In the beginning of 19th century, "anemia" was used as a clinical term referring to pallor of the skin and mucous membrane. The importance of red blood cells was highlighted by William Hewson (1739-74), father of hematology. Gabriel Andral (1843) postulated that clinical anemia is due to inadequate number of red blood cells.

Anemia is defined as a condition in which the number of red blood cells and their oxygen-carrying capacity is insufficient to meet the body's physiological needs.[7] There are significant consequences for human health as well as on social and economic development. Anemia has a multifactorial etiology including blood loss, decreased red blood cell production, and increased red blood cell breakdown.[3] Causes of blood loss include trauma, gastrointestinal bleeding, excessive bleeding during menstruation causes of decreased production include iron deficiency, lack of vitamin B12, folic acid, thalassemia, neoplasm of bone marrow and causes of increased breakdown includes number of genetic condition such as sickle cell anemia, infections like malaria and autoimmune diseases, etc.[3]

Iron deficiency, haemoglobinopathies and malaria are the three leading causes of anemia globally. Iron deficiency accounts for 50% of cases of anemia. Iron is an essential part of hemoglobin molecule and is most valuable remedy in the treatment of anemia. In 2013, anemia due to iron deficiency resulted in about 183,000 deaths.[4] Among the top 10 causes of years of life lost (YLLs) in 2017, Iron deficiency is the number one cause of disability across populations.[5]

Deficiency of iron develops gradually and does not have clinically apparent symptoms until anemia becomes severe.[6] Causes of iron deficiency across the vulnerable groups include -

- Insufficient quantity of Iron-rich foods in diet.
- Low bioavailability of dietary iron.
- Deficiency of "iron enhancers" in diet and excess of "iron inhibitors" in diet.
- Iron loss during menstruation and child birth.
- Poor iron stores due to infancy and childhood deficiency.
- Teenage pregnancy and pregnancies with <2 year interval.

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Age group	No anemia	Mild anemia	Moderate anemia	Severe anemia
Non pregnant women (15 years and above)	≥12 g/dl	11-11.9g/dl	8-10.9 g/dl	<8g/dl
Men	≥13g/dl	11-12.9g/dl	8-10.9g/dl	<8g/dl

- Parasitic infection (e.g. malaria, intestinal worms).
- Avoidance of Iron Folic Acid Tablets. Only 22.3% of mothers consume IFA tablets for 90 days or more NFHS-III.[7]

It has been observed that, the absorption of iron from mixed cereal-pulse diet is poor (5% in men and children and 8% in all women). Iron enhancers include food containing Vitamin C. Ascorbic acid: Iron ratio of 4:1 increases iron absorption by 300-350%.[8] Iron inhibitors include calcium containing foods, diet containing high fiber, Tea and Coffee containing tannins.[8]

The prevalence of anemia is >40% across all vulnerable groups constituting Infants and under 5 children, School age children(5-9 years), Adolescent girls (10-19years), Women of reproductive age group (15-49years), Pregnant and lactating women. There is the increased iron requirement during the pregnancy and the periods of growth (infancy, adolescents). Adult males may also be at risk where there is chronic energy malnutrition due to inadequate food intake or frequent parasitic infection. Girls are more likely to be a victim due to various reasons. In a family with limited recourses, the female child is more likely to be neglected.

Adolescence is an important period of nutritional vulnerability due to increased dietary requirements for growth and development. Accelerated growth, hormonal changes, onset of menstruation, malnutrition due to change in eating habits, taking insufficient quantity of iron-rich foods on diet are the main causes of anemia among adolescents.[9,10] Currently, many adolescents consume unbalanced diets which may lead to micronutrient deficiency leading to anemia.[11]

Medical students are more vulnerable to develop anemia due to irregular eating habits due to hectic study schedule. Anemia among this age group has significant health consequences resulting in poor cognition, decreased attention span and memory affecting the performance, depressed immunity, repeated infections, increased fatigue, shortness of breath, dizziness, blurred vision, low endurance and irregular menstruation. It significantly result in decreased work output and work capacity. It has a gradual onset and is not detected unless person becomes symptomatic.

It has been observed that 1g/dl increase in hemoglobin level is associated with increase in 1.7IQ points.[12] The first year of MBBS is the starting of professional carrier which is important and they need to look into their correct dietary and living habits. There has been multiple studies carried out to assess the prevalence of anemia among medical students entering in professional institutes, but no study has yet been carried out in this area. Hence, this study has an aim to find out the prevalence of anemia among First year MBBS students admitted at Maharaja Agrasen Medical College, Agroha, Hisar.

Study aimed to find the prevalence of anemia among first year MBBS students taking admission at MAMC, Agroha, Hisar and to find out socio – demographic correlates of anemia.

MATERIAL AND METHODS

A retrospective study was conducted among First year MBBS students who took admission at Maharaja Agrasen Medical College, Agroha, Hisar. Prior permission was taken from Institutional Ethics Committee. A total of 100 students were admitted in year 2018. Hemoglobin values and other details of the subjects were taken from academic section submitted at time of admission. World Health Organization criteria were taken to determine the severity of anemia.[13] Modified B.G. Prasad scale was used to assess the socio-economic status of the family.[14]

STATISTICAL ANALYSIS

Data was first entered into MS excel sheet and then was exported to SPSS version 20.0 for appropriate analysis.

RESULTS

Figure 1 shows the prevalence of anemia among study subjects. A total of 100 students were taken as study subjects including 43(43%) female students and 57(57%) male students. Most of the study subjects 68 (68%) were in the age group of 17-19 years and 35 (32%) were more than 20 years

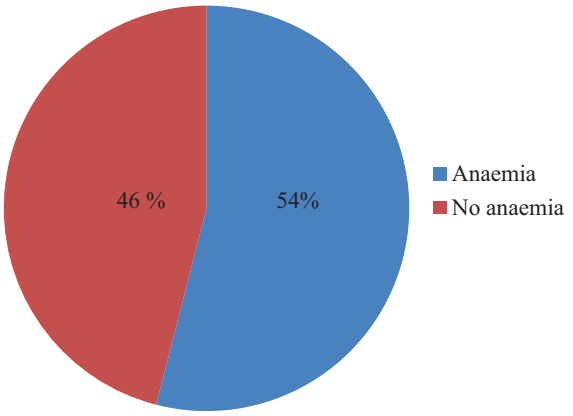

Figure-1: Prevalence of Anemia among study subjects.

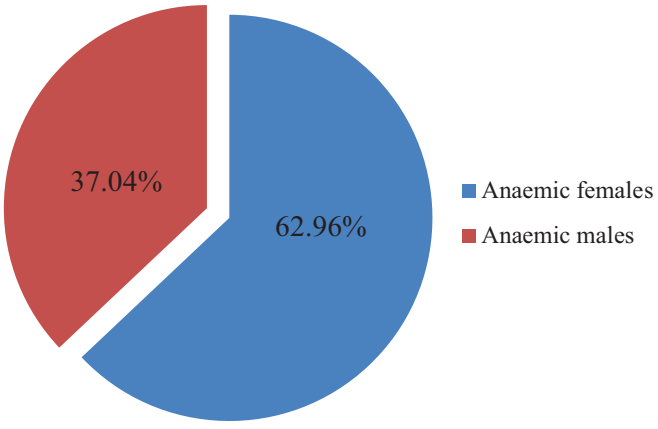

Figure-2: Prevalence of anemia by gender among study subjects

Type of family	Anemia						□2 (df)	p
	Present		Absent		Total			
	No.	%	No.	%	No.	%		
Nuclear	32	46.4	37	53.06	69	100	5.207 (1)	0.022
Joint	22	71.00	9	29	31	100		
Total	54	54	46	46	100	100		

Table-1: Association of anemia with type of family

SE status	Anemia						□2 (df)	p
	Present		Absent		Total			
	No.	%	No.	%	No.	%		
U Class	31	47.7	34	52.3	65	100	3.097 (2)	0.213
UM Class	10	62.5	6	37.5	16	100		
M+other	13	68.4	6	31.6	19	100		
Total	54	54	46	46	100	100		

Table-2: Association of anemia with socio- economic status of family

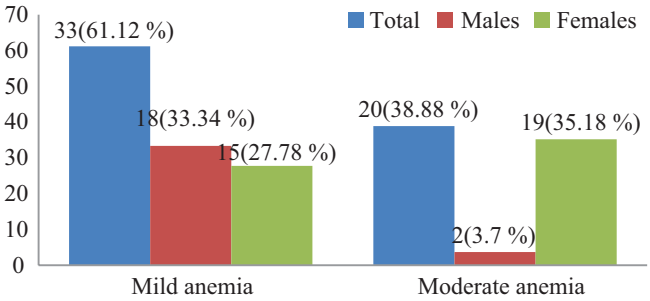

Figure-3: Severity of anemia among study subjects according to hemoglobin values

of the age group pursuing their MBBS course. All students were unmarried at the time of admission.

The Difference between the mean levels of hemoglobin across the genders came out be statistically significant (P=<0.001) (Figure -2). If we observe about the severity of anemia among students there was mild anemia among 33 (61.12%) students followed by moderate anemia accounting for 20 (38.88%) students (Figure-3), none of the study subject had severe anemia.

It has been observed in the study that low level of hemoglobin is significantly associated with type of family as 22 (71%) of study subject's belonged to joint family and 32 (46%) subjects belong to nuclear family. (p=0.002) (Table-1).

In this study, there came out to be no significant association between socio-economic status and anemia (p=0.213) (Table-2).

DISCUSSION

Anemia is the world's second leading cause of disability and thus one of the most serious global public health problem.[15] Adolescents are vulnerable to develop anemia due to increased iron requirement. This problem is commonly faced by young females and males in the developing countries.

This study had maximum number of study subjects, 68% in the age group of 17-19 years which is similar to the study conducted by Kaur M et al among Medical students of SGRDIMSAR, Amritsar[16] having study subjects 300(100%) in the age group of 17-19 years pursuing their medical course.

In a study conducted by K Subramaniyan et al[17] among 549 health science university students of South India 43% (237) had anemia. They had significance preponderance of female students with anemia as compared to male students (97 vs 68% p=0.0001). Similarly this study is showing more prevalence of anemia among female students (62.96%). It is estimated that 42mg of iron is lost per menstrual cycle as documented by various studies in different areas which is the leading cause of anemia in females.

Finding of this study is in contrast to study conducted by Kanchan R[18] et al among first year MBBS students at Karnataka, showing more prevalence of anemia among males 42% when compared to females 21%. The reason of this inconsistency among study subjects may be due to differences in socio-cultural, economic and geographical conditions and also demand the frequent hemoglobin monitoring among MBBS students.

Chaudhary SM[19] et al conducted study among adolescent females of Nagpur documented that 72 (69.2%) and 32 (30.8%) of subjects with mild and moderate anemia respectively and none of the subjects had severe anemia which is comparable with this study observation of having mild and moderate anemia and none student having severe anemia.

This study claims high prevalence of anemia among the students belonging to joint family 22(71%) which is in contrast to study conducted by Rawat et al[20] showing the prevalence of anemia in joint families and nuclear families 22.75% and 32.25%respectively. In this study there was significant relationship between type of family and anemia (p<.0001).

There was no significant association of anemia with socioeconomic status which is similar with the study conducted by Dutt R et al among adolescent girls in rural area of Raigad district.[21] Thus it appears that among study subjects socio-economic status have a lesser influence on anemia status.

Limitation

- Only 100 students are taking admission in first year

MBBS.

CONCLUSION

There occurs high degree of variability in the prevalence of anemia among studies conducted by various researchers. The reason for increased prevalence among study subjects could be low intake of iron rich food, menstrual loss, erratic eating habits. It is more prevalent in both sexes due to growth spurt.

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