Original Research

A Prospective study to assess Prevalence of Anemia in College Students

Dr. Amit Varshney,

Associate professor, Department of General Medicine, United Institute of Medical Sciences & Hospital, Prayagraj, India

ABSTRACT:

Background: Anemia in children may resulted from poor bioavailability of iron, infections like intestinal parasites, malaria and tuberculosis (TB). **Aim of the study:** To study prevalence of anemia in college going students. **Materials and methods:** The study was conducted in the department of General Medicine of the medical institute. For the study we selected subjects from the local government colleges. A total of 300 college going students aging 18-27 years were enrolled in the study. Hemoglobin determination was done by laboratory technicians for the selected students in the college compound. The haemoglobin concentration of each student was measured by taking a finger-prick blood sample using a Hemocue haemoglobinometer (Hemocue, angelholm, Sweden). **Results:** We observed that 58.3 % of subjects did not have anemia, 19.67 % subjects had mild anemia, 14.67 % subjects had moderate anemia and 7.3% subjects had severe anemia. The maximum no. of subjects were found in the age of 6 years (n=44) followed by 14 years (n=36). Boys comprised of 39.67 % of the study population and girls comprised of 60.33 % population. Severe anemia occurred in 10 boys and 13 girls. Moderate anemia occurred in 14 boys and 30 girls. Mild anemia occurred in 24 boys and 35 girls. **Conclusion**: We conclude that about 41.7 % of the college students from our study population were found to be anemic.

 Keywords: Anemia, college students, Hemoglobin.

Corresponding author: Dr. Amit Varshney, Associate professor, Department of General Medicine, United Institute of Medical Sciences & Hospital, Prayagraj, India

INTRODUCTION:

Anemia' refers to a condition in which the hemoglobin content of the blood is lower than normal as a result of deficiency of one or more essential nutrients [1], heavy blood loss, parasitic infections and congenital hemolytic diseases. [2] Globally, anemia is a public health problem affecting people in both developed and developing countries with bad consequences of human health as well as social and economic development.[3] Anemia is a critical health concern because it affects growth and energy levels adversely.[2] It damages immune mechanisms and is also associated with increased morbidity. [3] Anemia in population may resulted from poor bioavailability of iron, infections like intestinal parasites, malaria and tuberculosis (TB).

Although anemia has a variety of causes, it is generally assumed that 50% of cases are caused by iron deficiency. The main risk factors for iron deficiency among young children in developing countries are malnutrition (low intake) and high requirement of iron during child growth. Due to the multifactorial conditions, complexity of risk factors of anemia and potential interactions among them, a single strategy to control anemia in developing countries may have little success. An integrated strategy for anemia control and prevention is required.[4-6] Hence, the present study was conducted to study prevalence of anemia in college going students.

MATERIALS AND METHODS:
The study was conducted in the department of General Medicine. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. For the study we selected subjects from the local government colleges. A total of 300 college going students aging 18-27 years were enrolled in the study. Hemoglobin determination was done by laboratory technicians for the selected students in the college compound. The haemoglobin concentration of each student was measured by taking a finger-prick blood sample using a Hemocue haemoglobinometer (Hemocue, angelholm, Sweden). A prick was made on the tip of the middle finger after the site was cleaned with disinfectant. The first drop of blood was cleaned off and the second drop (0.05 ml) was collected to fill the microcuvette which is then placed in the cuvette holder of the device (HemoCue Hb 301+) for measuring hemoglobin concentration. The displayed hemoglobin value was then recorded. The technique is recommended by WHO for use in field surveys.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

RESULTS:
Table 1 shows the prevalence of anemia in children on the basis of age. We observed that 58.3 % of subjects did not have anemia, 19.67 % subjects had mild anemia, 14.67 % subjects had moderate anemia and 7.3% subjects had severe anemia. The maximum no. of subjects were found in the age of 6 years (n=44) followed by 14 years (n=36). Table 2 shows the prevalence of anemia in children on the basis of sex of children. Boys comprised of 39.67 % of the study population and girls comprised of 60.33 % population. Severe anemia occurred in 10 boys and 13 girls. Moderate anemia occurred in 14 boys and 30 girls. Mild anemia occurred in 24 boys and 35 girls. The results on comparison were seen to be statistically significant (p<0.05) [Fig 1 and 2].
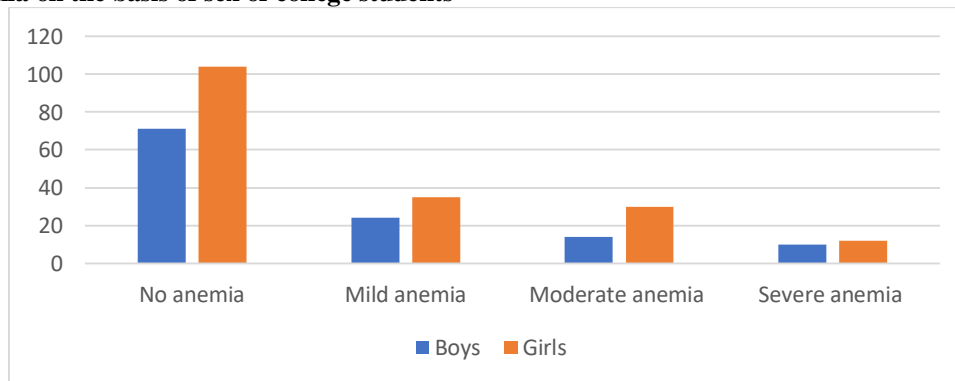
Table 1: Prevalence of anemia in college students on the basis of age

Age (in years)	No anemia	Mild anemia	Moderate anemia	Severe anemia	Total
18	35	4	3	2	44
19	29	3	2	1	35
20	18	6	4	3	31
21	12	4	4	1	21
22	11	8	3	1	23
23	15	4	8	2	29
24	14	9	5	3	31
25	16	9	6	4	35
26	19	7	7	3	36
27	6	5	2	2	15
Total	**175 (58.3 %)**	**59 (19.67%)**	**44 (14.67%)**	**22 (7.3%)**	**300 (100%)**

Table 2: Prevalence of anemia in children on the basis of sex of college students

Sex	No anemia	Mild anemia	Moderate anemia	Severe anemia	Total
Boys	71	24	14	10	119 (39.67%)
Girls	104	35	30	12	181 (60.33%)
Total	**175 (58.3 %)**	**59 (19.67%)**	**44 (14.67%)**	**22 (7.3%)**	**300 (100%)**

Fig 1: Anemia on the basis of sex of college students

DISCUSSION:

In the present study we evaluated the prevalence of anemia in college going students. We observed that 58.3 % of subjects did not have anemia, 19.67 % subjects had mild anemia, 14.67 % subjects had moderate anemia and 7.3% subjects had severe anemia. The anemia was more commonly seen in girls as compared to boys. On comparing the results we observed that the results were statistically non-significant.

Joglekar et al[7] conducted a cross-sectional, descriptive study study to assess the prevalence of anemia in 178 college going girls between the age group of 18-25years among college going girls. The overall prevalence of anemia was 63.48%. Out of 178 Adolescents College going girl, 113 (63.48%) had varying severity of anemia, while anemia was absent in 65(36.52%) girls. Out of the 113 girls, 30 (16.86%) were mild anemic, 70 (39.32%) were moderately anemic and 13(7.30%) were severely anemic. They revealed that anemia is major health problem among the college going girls in government hostels. Continuous follow-up programme and nutrition education can improve the nutritional status of college going girls.

Righetti AA et al determined the prevalence of anemia and studied underlying risk factors in infants (6–23 months), young school-aged children (6–8 years), and young non-pregnant women (15–25 years) in south-central Côte d'Ivoire. Blood, stool, and urine samples were subjected to standardized, quality-controlled methods. They found high prevalence of anemia, malaria, inflammation, and deficiencies of iron, riboflavin, and vitamin A but low prevalence and intensities of soil-transmitted helminth and schistosome infections. Multivariate regression analysis revealed significant associations between anemia and Plasmodium falciparum for infants, inflammation for school-aged children, and cellular iron deficiency for both school-aged children and non-pregnant women. Women with riboflavin deficiency had significantly lower odds of anemia. Their findings call for interventions to protect infants from malaria, improved intake of dietary iron, better access to health care, and health education. [8]

Ferreira MU et al[9] investigated the prevalence and risk factors of anemia and iron deficiency in 398 rural Amazonians aged 5–90 years in Acre, Brazil. Anemia and iron deficiency were diagnosed in 16% and 19% of the population, respectively. Anemia was likely to have multiple causes; although nearly half of anemic school children and women had altered iron status indicators, only 19.7% of overall anemia was attributable to iron deficiency. Geo-helminth infection and a recent malaria episode were additional factors affecting iron status indicators in this population. Syed S et al[10] determined in three countries the prevalence and determinants of anemia in SAC. Data on sociodemographics, inflammation and nutrition status were obtained from the 2006 Mexican National Nutrition Survey, the 2003-6 US National Health and Nutrition Examination Surveys, and the 2010 Encuesta Nacional de Nutrición Situación Colombia. In the US, vitamin A and iron deficiency (ID) were available only for girls aged 12.00–14.99 years to which our analysis was limited. The prevalence of anemia and ID were: Mexico 12% (ID 18%), n = 3660; US 4% (ID 10%), n = 733; and Colombia 4% (ID 9%), n = 8573. The percentage of anemia associated with ID was 22.4% in Mexico, 38.9% in the US and 16.7% in Colombia. In Mexico, anemia was associated with ID and overweight. In the US, anemia was associated with black race/ethnicity and ID. In Colombia, anemia was associated with black race/ethnicity, lowest socio-economic status quintile, ID, and being stunted. While anemia was uniformly associated with iron deficiency in Mexico, Columbia, and the United States, other measured factors showed inconsistent associations with anemia. [9, 10]

Singh G et al[11] conducted a cross-sectional study in among the 74 urban, college going girl students in age group of 18-28 years to determine the prevalence of anaemia in urban, educated, young, unmarried, college going girl students. Their study revealed that the prevalence of anaemia was found 36.49% in the present study. Out of the 36.49% anaemics, 35.14% were mildly anaemic that is Hb was in range of 10-11.99 gm% and only 1.35% was moderately anaemic that is Hb was in range of 7-9.99 gm% and no subject was severely found anaemic.

Kapoor M et al[12] in their study observed that out of 96 subjects, males were 24 and females were 72. The difference was significant (P- 0.01). Age group 11-20 years had 4 males and 10 females, 21-30 years had 7 males and 21 females, 31-40 years had 8 males and 20 females, 41-50 years had 3 males and 15 females and 51-60 years had 2 males and 6 females. The difference was significant (P- 0.05). 55 subjects had hemoglobin of 8 gram % and 17 had hemoglobin of 9 gram %. The difference was significant (P- 0.05). Serum ferritin level of 88ng/ml was seen in 14 males and 22 females, 70 ng/ml of serum ferritin was seen in 10 males and 50 females. The difference was significant (P- 0.05). They concluded that Iron deficiency anemia is quite common in females as compared to males. The common cause is blood loss through menstruation cycle. Other possible causes are nutritional deficiency etc.

Similar kind of study conducted by Sirpal V et al on 1412 subjects observed that age group 10-20 years had 512 subjects, 20-30 years had 234, 30-40 had 130, 40-50 had 405 and >50 years had 131. The prevalence of iron deficiency anemia found to be 49.7%. Iron Deficiency Anemia is common cause of anemia all over the world. The prevalence found to be 49.7%.

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CONCLUSION:

Within the limitations of the study we conclude that about 41.7 % of the college going students from our study population was anemic. The results suggest that anaemia can be prevented by providing proper knowledge on the healthful diet, improved lifestyle, and harmful effect of anaemia to the students.

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