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Prevalence of Anemia in English-Class Medical Students of Udayana University

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Abstract: ***Anemia is a common problem in the world, especially in developing country. Anemia is a condition where the normal value of red blood cell or hemoglobin decreases. Medical students are at high risk of anemia because of their long studying hours, clinical practice, and other activities. This research is a cross sectional, descriptive research using complete blood count (CBC) results of English Class Medical Students Batch 2014 in Udayana University. The purpose of the study is to find out the prevalence of anemia case in English class medical students class of 2014 in Udayana University. Of the 82 samples, 5 students (6.1%) had anemia. All of the 5 students were female, and all were classified as mild anemia. The mean of hemoglobin of male students was 15.89 g/dl and for female students was 13.87 g/dl.***

Keywords: red blood cells, hemoglobin, long studying hours, complete blood count

1. Introduction

Anemia is a common problem in the world especially in developing countries. According to World Health Organization (WHO), anemia occurs in 24.8% of the total population in the world. The greatest prevalence of anemia is in school-aged children by 47.4% [1].

The prevalence of anemia in Indonesia is 21.7%. In patients aged 5-14 years of 16.4% and in patients aged 15-24 years of 18.4%. The prevalence of anemia in children under five years old is 40.5%, and in adolescent girls with age 10-18 years old is 57.1% [2,3].

Anemia is a condition where the number of red blood cells decreases, or where the normal amounts of hemoglobin in the blood drop below normal. Iron deficiency anemia is the most common cause of anemia worldwide. Anemia can also be caused by other micronutrient deficiencies, infectious diseases, genetically determined hemoglobinopathies, and chronic or acute bleeding.

Anemia in adolescents can lead to late physical growth, behavioural disorders, and emotional disturbances. These things may affect the process of growth and development of the brain cells, thus cause a decline in endurance, disruption of learning concentration, decreased learning achievement, and low productivity [4].

Medical students are also included in the group who are susceptible to anemia due to long study hours and clinical practice. Those who live independently may also lacking in food intake, thus cause a significant effect on the prevalence of anemia. Nutritional needs will develop over a period of time in life, so that individuals will experience a higher risk for nutritional deficiencies. Adolescence or young adulthood is the most vulnerable period in the human life cycle as nutritional needs increase during growth [5].

The purpose of this study is to find out the prevalence of anemia in medical student class of 2014 in Udayana University

2. Material and Methods

This is a descriptive, cross sectional study. This research was conducted in February-November 2017. All the patients or their guardians have provided written informed consent to be included in this study. The sample of this study is medical students enrolled in 2014 English class of Udayana University who are eligible. Exclusion criteria include those who were not present when the blood sampling took place, experiencing menstruation during blood sampling, and has a history of chronic diseases.

Hematology Analyzer Prokan PE-6800 was used to analyse complete blood count (CBC) in Clinical Pathology Department-Sanglah Hospital/Faculty of Medicine, Udayana University. The data was analysed using SPSS 12.0. Frequency distribution technique is used to analyse data. Results were then presented descriptively in the form of graphics and text.

3. Results

This study involved 82 samples, with 5 (6.1%) persons have mild anemia. Subjects characteristic can be seen in Table 1. Authors measuring the concentration of data from a group of numbers in the statistical distribution using Median value with *Interquartile range* (IQR).

Table 1: Subjects Characteristic

Variables	n (%)
Sex	
Male	41 (50)
Female	41 (50)
Anemia Status	
No anemia	77 (93.9)
Mild (10-11 g/dL)	5 (6.1)

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Moderate (7.0-9.9 g/dL)	0 (0)
Severe (<7 g/dL)	0 (0)
Hemoglobin levels (g/dL), Median(IQR)	15.30 (6.00)

Table 2 shows that all five persons who suffer from anemia were all female. Anemia is more common in female students than in men.

Table 2: Gender cross tabulation with anemia status

	Anemia	Not Anemia	Total
Male	0 (0%)	41 (100%)	100%
Female	5 (12,2%)	36 (87,8%)	100%

Table 3 shows the mean result of hemoglobin level for each gender. In male group it is 15.89 ± 1.01 g/dL compared to 13.87 ±1.65 g/dL in female group.

Table 3: Mean of Hemoglobin Level Based on Sex

Variable	Male (mean ± SD)	Female (mean ± SD)
Hemoglobin levels (g/dL)	15,89 ± 1,01	13,87 ± 1,65

4. Discussion

The results of this study indicate that only a small proportion of medical students who suffer from anemia. This is different from previous study by Pandey who found that 30.2% medical students suffering from anemia (n=96). The study also found that anemia was more common in female compared to male students (47.37% vs 18.96%) [5].

Another study by Subramaniyan in South India showed a greater prevalence of anemia (43% of 237 medical students). Different results between our research and previous studies can be attributed to several factors such as different demographic characteristics, diet, and socioeconomic conditions [6].

Murphy states that men and women have different mean hemoglobin levels, women have lower mean hemoglobin levels than men. This difference may be a direct effect of the sex hormones estrogen and androgens in erythropoiesis. But since there is no difference from the level of erythropoietin in men and women then this effect is most likely to occur in the kidney not in the bone marrow. Estrogen dilates while androgens contribute to increasing and decreasing haematocrit levels in the blood in arteries, capillaries and veins that can alter oxygen delivery in red blood cells [7].

The results of this study found that the mean hemoglobin level in male and female students were 15.89 g/dL and 13.87 g/dL respectively, which were still within normal limits according to WHO. This is similar to the results of previous study by Khakurel which shows differences in mean hemoglobin levels in male and female students where the mean hemoglobin level in male students is higher than for female students [8].

Limitations of this study was design-related. This is a descriptive cross sectional study, which has less power in explaining the cause of anemia. Similar studies with a larger number of sample is needed to provide a better description in medical students group. A control group consist of non-medical students may also be needed to see whether medical students were really in higher risk to anemia compared to non-medical students.

5. Conclusion

The prevalence of anemic students was 6.1% and those with no anemia were 93.9% of 82 samples. The mean hemoglobin level in the male and female students were 15.89±1.01g/dL and 13.87±1.65 g/dL respectively.

6. Conflict of Interest

The authors declare no conflict of interest in this work.

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