Research Article

Awareness of anemia among dental undergraduate students: A questionnaire-based study

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ABSTRACT

Aim: This study aimed to evaluate the knowledge and awareness regarding anemia among dental undergraduate students. **Materials and Methods:** A crosssectional study was conducted during the academic year of January 2019 among the dental students of Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India. A total of 100 dental undergraduate students were involved in the study, including both males and females. All students in the study voluntarily completed a questionnaire consisting of twenty closeended questions which were designed to assess their basic knowledge and awareness regarding anemia. Data were analyzed by descriptive and inferential statistics, and results were obtained. **Results:** Only 54.2% of the respondents reported having information about anemia and 78% considered themselves not enough informed, a fact observed through the low percentage of right answers in a knowledge test. **Conclusion:** Most dental students have poor knowledge regarding anemia and its causes, prevention, and management. Educational interventions should be implemented among undergraduate students through awareness programs to increase their knowledge and awareness of identifying anemic patients entering their hospital for treatment.

KEY WORDS: Anemia, Education, Hospital, Knowledge, Undergraduate students

INTRODUCTION

Anemia remains a public health problem worldwide. According to the World Health Organization (WHO), an estimated 150 million individuals in the Eastern Mediterranean region suffer from some type of anemia.[1] There are many causes for anemia; these causes may simply be attributed to acquired or congenital disorders. Iron deficiency anemia is the most frequently acquired nutritional anemia, and over 2 billion people, i.e., nearly one-third throughout the world suffer from iron deficiency anemia.[2] According to the WHO, the highest prevalence of anemia is observed in nonpregnant women aged 15–49.99 years.[3] Women of childbearing age are having an additional risk of developing anemia because of their monthly menstrual blood loss, and nearly 50% of females in this age group are anemic.[4] On an average, a healthy woman loses about 25–30 mL of blood monthly. Therefore, the body needs to produce blood in order to compensate for this loss, and if the essential nutrients required for hemopoiesis are not supplied in their diet, anemia will develop. The prevalence of anemia among nonpregnant women is 30.2% worldwide.[5] Primary care providers often manage patients with common types of anemia and refer patients with severe or complex anemia to specialists for further testing and treatment. The most commonly used and cost-effective diagnostic tool for anemia is the complete blood count (CBC).[6] The CBC provides details that can help the provider determine the type of anemia present, which in turn guides proper diagnostic testing and treatment.[7,8]

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Epidemiology

Anemia involves a reduction in the number of circulating red blood cells (RBCs), the blood hemoglobin content, or the hematocrit, which leads to impaired delivery of oxygen to the body. Anemia affects more than 2 billion people worldwide, with iron deficiency being the most common cause.[8] Other leading nutritional causes of anemia include Vitamin B12 and folate deficiency.[9]

Pathophysiology

Blood is composed of water-based plasma (54%), white blood cells (WBCs) and platelets (1%), and

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RBCs (45%).[8] Bone marrow cannot produce enough RBCs if there are insufficient levels of iron, amino acids, protein, carbohydrates, lipids, folate, and Vitamin B12.[5] Toxins (e.g., lead), some types of cancer (e.g., lymphoma), or even common infections (e.g., pneumonia) can suppress the bone marrow, causing anemia.[10] Genetic defects of hemoglobin structure, such as sickle cell disease and thalassemia, cause anemia.[11] While it is important to identify and treat patients with hemoglobinopathies, most anemias have other causes, such as iron deficiency, chronic disease, bone marrow defects, B12 deficiency, renal failure, medications, alcoholism, pregnancy, nutritional intake problems, gastrointestinal malabsorption, and active or recent history of blood loss.[12]

Clinical Presentation

Too often, the physician rushes into the physical examination without looking at the patient to ascertain if there is an unusual habitus, an appearance of underdevelopment, malnutrition, or chronic illness, which can be important clues to the underlying etiology of disease. Second, the skin and mucous membranes are often bypassed, so pallor, abnormal pigmentation, icterus, spider nevi, petechiae, purpura, angiomas, ulcerations, palmar erythema, coarseness of hair, puffiness of the face, thinning of the lateral aspects of the eyebrows, and nail defects occur.[13] Additional clinical findings associated with chronic iron deficiency include glossitis, angular stomatitis, and koilonychias (spoon-shaped nails).[14]

Diagnosis and Classification

Anemia in adults is defined as hemoglobin <13 g/dL in males and <12 g/dL in females.[6] The hemoglobin is part of the CBC report, which also includes WBC count, RBC count, hematocrit, platelet count, and indices.[15] When investigating the underlying cause of anemia, the most useful parts of the CBC are hemoglobin and the mean corpuscular volume (MCV). This parameter is used to classify the anemia as microcytic (MCV <80 fL), normocytic (MCV 80–100 fL), or macrocytic (MCV >100 fL), which helps to narrow the differential diagnosis and guide any further testing.[12]

Patient Education

Patients and any accompanying family members should be educated about the signs and symptoms of anemia, the diagnostic testing and treatment regimens specific to their anemia, and medication compliance issues. For instance, patients who abuse alcohol often have both Vitamin B12 and folate deficiencies. These patients can sometimes recover from macrocytic anemia simply by stopping alcohol intake and improving their nutritional status.[19] Patients with microcytosis due to iron deficiency anemia should be advised about the importance of good nutritional status and compliance with iron supplementation. Repeat CBCs and a follow-up patient history and physical examination will help the provider assess whether the anemia is resolving. Individualized plans that target the specific type of anemia identified, as well as its underlying cause, are key to successful treatment.[16]

Thus, it is fundamentally an important knowledge diffusion with regard to hematologic dysfunctions even in the undergraduate level because these patients must receive special attention in accordance with their health status.

MATERIALS AND METHODS

A crosssectional study was conducted during the academic year of January 2019 among the dental students of Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India. A total of 100 dental undergraduate students were involved in the study, including both males and females. All students in the study voluntarily completed a questionnaire consisting of twenty closeended questions which were designed to assess their basic knowledge and awareness regarding anemia. The data collection instrument was a questionnaire divided into three blocks as follows: Block I: three questions regarding the basic knowledge of anemia, Block II: ten questions regarding the knowledge of hematological dysfunctions and their interference in dentistry, and how information was obtained, and Block III: questions on laboratory investigations and treatment modalities. The questionnaire was handed over to the students through an online application named "SurveyPlanet." Descriptive statistics (relative and absolute frequencies) were employed in the data analysis. Data were analyzed with the statistical software Statistical Package for the Social Sciences (version 16.0).

RESULTS

Only 54.2% of the respondents reported having information about anemia and 78% considered themselves not enough informed, a fact observed through the low percentage of right answers in a knowledge test, which is observed from the values obtained from the questionnaire answered through the online SurveyPlanet. Upon asked to identify the symptoms of anemia, around 40% of the 100 students were able to identify symptoms such as pallor and weakness, but only 6.7% of the population of the study identified shortness of breath, difficulty in concentration, and frequent headaches as the symptoms

[Figure 1]. Nearly 70% of the population were of the opinion that only lack of dietary iron and heavy menstrual bleeding could be the etiology of anemia when asked to choose multiple-choice answers, thus proving the lack of knowledge of etiology of anemia [Figure 2]. When questioned on the diagnostic aspects of anemia, only 10% of the population chose the right answer for the normal hemoglobin value required for an adult female as shown in Figure 3.

DISCUSSION

Only 54.2% of the respondents reported having information about anemia and 78% considered themselves not enough informed, a fact observed through the low percentage of right answers in a knowledge test. In contrast, this result was lower than the percentage in a recent study, where 91% of the female adolescents had heard about anemia.[17] Nutritional anemia, especially iron deficiency anemia, is more prevalent among women in the adolescent and reproductive age group due to menstrual blood loss, poor diet, bleeding during parturition, etc.[18] People suffering from anemia are more prone to oral diseases. From the research, it was concluded that 68% of patients had paled gums as they lack sufficient RBCs in the body and about 69% of the patients bear stingy smell in their mouth. It was found that 54% of the patients had bleeding gums due to lack of hemoglobin or RBCs. Pernicious anemia is a type of Vitamin B12 anemia. It is required for the synthesis of RBCs in the body. Absence of this causes bleeding gums, shortness of breath, etc. Color changes in the tongue were observed in about 58% of the patients; this proves the importance of knowledge of anemia and its signs and symptoms in clinical diagnosis in the presence of oral manifestations.[19]

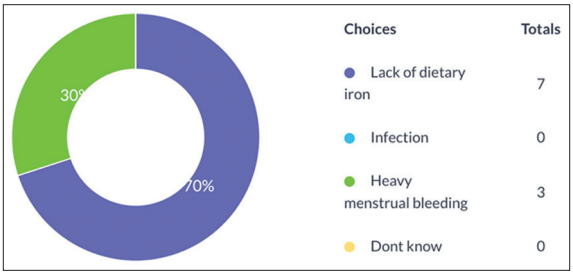

Figure 1: Etiology of anemia

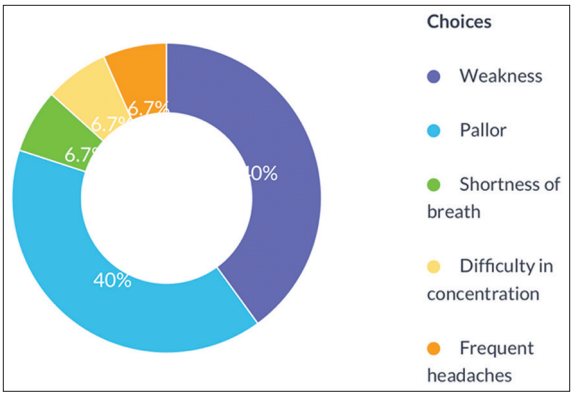

Figure 2: Symptoms of anemia

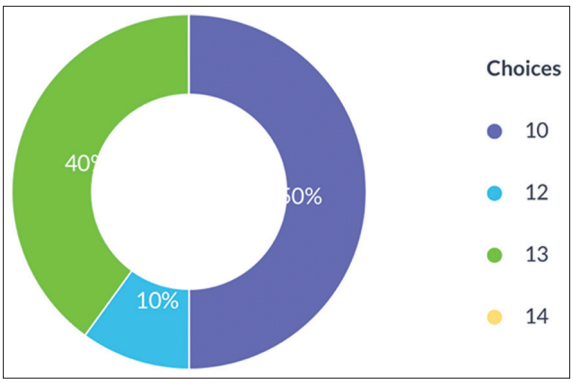

Figure 3: World Health Organization-described values of normal hemoglobin for adult female

Around 52% of the study sample lack awareness on foods rich in iron and foods that cause decreased absorption of iron, and this result was consistent with a recent study conducted in Sudan, which concluded that 73.4% of the participants aged 18–24 years were unaware of the sources of iron.[20] However, it was reported in this study that about 25% of the study sample knew that tea and coffee reduce iron absorption, and this result was inconsistent with the result obtained by Angadi and Ranjitha (43%).[21] On the other hand, 64.1% of the participants in the current study answered that Vitamin C enhanced iron absorption, and this result was consistent with a study conducted by Angadi and Ranjitha (74.1%)[21] but was inconsistent with the result reported by Kotecha *et al*.[22] A recent study conducted in 2015 concluded that 17% of the female adolescents were aware of the prevention of anemia, and this result is consistent with the finding of this study (21.4%).[23] Nearly 35.9% of the participants in the current study knew that iron absorption could be increased through the intake of food. However, this result was inconsistent with a recent study conducted in India, which concluded that 59% of female adolescents aged 15–17 years knew that food intake increases iron absorption.[24]

CONCLUSION

When managing a patient with anemia, providers must define the type of anemia present and identify its underlying cause before starting treatment. Clues from the patient's history, physical examination, and CBC can help isolate the cause of anemia. As budding dentists, they should have more awareness regarding anemia. Knowing anemia will help a lot while practicing in clinics, to detect anemic patients as anemia is the most leading cause of death worldwide. Therefore, they lack knowledge in clinical criteria

including the diagnosis and treatment part of anaemia. Hence, measures should be taken to ensure proper education of these students and awareness programs could be conducted.

REFERENCES

1. Verster A, Van der Pols JC. Anemia in the Eastern Mediterranean region. Eastern Mediterr Health J 1995;1:64279.
2. Fairbanks VF, Buetler E. Iron deficiency. In: Beutler E, Lichtman MA, Coller BS, Kipps TJ, Seligsohn U, editors. Williams Hematology. 6th ed. New York: McGraw-Hill; 2001. p. 4472456.
3. World Health Organization. WHO Report, World Prevalence of Anemia 1993–2005. WHO Global Database on Anemia. Geneva, Switzerland: World Health Organization; 2008.
4. Verdon F, Burnand B, Stubi CL, Bonard C, Graff M, Michaud A, *et al.* Iron supplementation for unexplained fatigue in non-anaemic women: Double blind randomised placebo controlled trial. BMJ 2003;326:1124.
5. Das B, Sengupta B, Chakrabarti S, Rudra T, Sengupta S. Incidence of anaemia among the female tea garden workers in a tea plantation in upper Assam, India. J Indian Med Assoc 2012;110:84-7.
6. Van Vranken M. Evaluation of microcytosis. Am Fam Physician 2010;82:1117-22.
7. National Institutes of Health/National Heart, Lung, and Blood Institute. How is Anemia Diagnosed? Available from: http://www.nhlbi.nih.gov/health/health-topics/topics/anemia/diagnosis. [Last accessed on 2017 Apr 28].
8. Smith RE Jr. The clinical and economic burden of anemia. Am J Manag Care 2010;16:S59-66.
9. Platt A, Eckman J. Diagnosing anemia. Clin Rev 2006;16:44-50.
10. O'Neil J. Diagnosing and classifying anaemia in adult primary care. Clin Rev 2017;27:28-35.
11. DeLoughery TG. Microcytic anemia. N Engl J Med 2014;371:1324-31.
12. Tefferi A, Hanson CA, Inwards DJ. How to interpret and pursue an abnormal complete blood cell count in adults. Mayo Clin Proc 2005;80:923-36.
13. Conrad ME. Anemia. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd ed., Ch. 147. Boston: Butterworths; 1990.
14. Camaschella C. Iron-deficiency anemia. N Engl J Med 2015;372:1832-43.
15. Karnath B. Anemia in the adult patient. Hosp Physician 2004;40:32-6.
16. Imashuku S, Kudo N, Kaneda S. Spontaneous resolution of macrocytic anemia: Old disease revisited. J Blood Med 2012;3:45-7.
17. Jalambo MO, Hamad A, Abed Y. Anemia and risk factors among female secondary students in the Gaza Strip. J Public Health 2013;21:271-8.
18. Lakshmi C, Maragathavalli G. Prevalence of nutritional anaemia among patients reporting to Saveetha dental college. Int J Adv Res 2017;5:44-9.
19. Karpagam N, Priya J. Oral manifestation of anaemia. Res J Pharm Technol 2016;9:1766-9.
20. Elhassan MR, Gamal HE, Mohammed GS. Nutrition knowledge attitude and practices among students of Ahfad University for women. Indian J Sci Res 2013;4:25-34.
21. Angadi N, Ranjitha A. Knowledge, attitude and practice about anemia among adolescent girls in urban slums of Davangere city, Karnataka. Int J Med Sci Public Health 2016;5:416-9.
22. Kotecha PV, Nirupam S, Karkar PD. Adolescent girls' anaemia control programme, Gujarat, India. Indian J Med Res 2009;130:584-9.
23. Pareek P, Hafiz A. A study on anemia related knowledge among adolescent girls. Int J Nutr Food Sci 2015;4:273-6.
24. Righetti AA, Koua AY, Adiossan LG, Glinz D, Hurrell RF, N'goran EK, *et al.* Etiology of anemia among infants, school-aged children, and young non-pregnant women in different settings of South-central cote D'ivoire. Am J Trop Med Hyg 2012;87:425-34.

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