Journal of Pakistan Association of Dermatologists. 2023;**33(4)**:1342-1345.

Original Article

Oral manifestations in individuals with iron deficiency anemia attending to college of dentistry

Hanaa Khazaal Jaber

Department of Oral Surgery, Collage of Dentistry, University of Basrah, Iraq.

Abstract

Objective Iron deficiency anemia (IDF) presented with specific oral features and a specific blood profiles. This study aimed to document the presence, severity and prevalence of the oral features of IDA in patients attending College of Dentistry.

Methods Totally, 180 cases enrolled. Past medical and surgical plus clinical examination done for each participant. Any features of anemia, oral mucosal manifestations were recorded. The distinguish of the oral mucosal forms were clinically depend on lesions basis.

Results The findings showed that the prevalence at different hemoglobin (Hb) levels in the IDA group included fissured tongue (32.3%), atrophic glossitis (AG) (24%), recurrent aphthous ulcer (RAU) (15%) pallor(16%), oral candidiasis (5%), burning sensation (2.2%), oral pigmentation (2.2%), angular cheilitis (1.1%), and periodontitis (0.6%).

Conclusion Through this research, information was added to us about the effects of anemia on the oral cavity and the etiology of lesions and through it we can reach the correct diagnosis and treatment as early as possible and thus reduce the harmful adverse events of anemia.

Key words
Oral manifestations; Iron Deficiency Anemia; Hemoglobin.

Introduction

Anemia defined as lack of blood or low hemoglobin count or low hematocrit. It occur when the level of Hb in RBCs dropped. IDA is a widely commonest type of anemia. In childbearing age females, a commonest reason of IDA is the iron lost in the blood because of heavy menstruation and/ or due to the pregnancy. Certainly, intestinal parasitic diseases and malnutrition due to poor diet intake influence the mechanism of the body for absorbing iron which mainly lead to IDA.[1]

Address for correspondence
Dr. Hanaa Khazaal Jaber
Department of oral surgery,
Collage of Dentistry,
University of Basrah, Iraq 61001.
Ph: +7801042371
Email: medicalresearch82@yahoo.com

Approximately, 25% of people worldwide have IDF.[2] The etiology of IDA varies upon age, sex, and socioeconomic pattern. IDA may happen due to insufficient iron intake, failure of absorption, or blood losing and raised systemic need.[2]

Oral signs of IDA include atrophic glossitis, angular cheilitis, mucosal atrophy, painful fissures, angular stomatitis and dry scaling cheilitis of lips and mouth. Others including atrophic tongue (depapillation and loss of filiform shape), fungiform papillae and glossodynia. Some authors have concluded that IDA predisposing to oral candidiasis.[3-8] The treatment is focused on to rising the hemoglobin levels, RBCs levels, storage of iron and treated co-morbid illnesses.[6,9-12]

This work aimed to evaluate the severity and

prevalence of the oral signs of IDA in patients attending to College of Dentistry.

Methods

Study design and setting This work was included 60 cases: 18 men (30%) and 42 women (70%). IDA is more prevalent in Iraqi women (M:F = 1:2). The mean age was 33.8±11.3 years. Those having IDA, within a 5 months period of the study, from November 2021 till April 2022.

Patients and control groups For each case, two individuals with age (±2 years) and sex-matched control case was selected. Thus, the healthy control group composed of 120 healthy subjects (20 males and 100 females, their age ranged 20–81 years).

Inclusion criteria Hemoglobin <13 g/dL for male.

1. Hemoglobin <12 g/dL for female.
2. Serum iron level <60 μg/dL

Exclusion criteria

1. Systemic diseases.
2. Malignancy.

Full history was obtained; medical history, food, medication, previous surgical operations, bleeding history. Clinical examination which was done. Patients were suffering from pallor, filling tiredness, weak and poor physical exertion.

The oral manifestation were recorded including dry mouth, cracked lip corners, burning sensation, oral ulceration per month, some patient had habits like quid chewing.

Upon the Afore mentioned diagnostic criteria, the 60 IDA cases included 20 with angular cheilitis, 15 have recurrent aphthous ulcer, 17 with burning mouth syndrome and 8 have chronic periodontitis.

Blood iron, CBC, ferritin, B_{12}, folic acid, total iron binding capacity (TIBC) and homocysteine levels were assessed by the Lab tests done in the Department of Laboratory. These tests revealed:

- Drop Hb and hematocrit.
- Drop ferritin.
- Drop serum iron.
- Elevated transferrin or TIBC.
- Drop iron saturation.

This done by SPSS v.24 (IBM, NY, US). Comparisons of all variables done by Student t-test. The differences in frequency of all variables were compared by chi-squares test. The result was considered to be significant if $p \leq 0.05$.

Results

The mean Hb level was 9.6±10.2 g/dl for men and 8.77±10.5 g/dl for women. Five cases (6.1%) presented with life-threatening IDA. About (15, 27.8%) cases were have severe anemia. Ten patients (35.6%) with moderate status, whereas mild phase was seen in 30(30.6%) of cases. There was no significant correlation between Hb and oral manifestations.

Fissured tongue was observed in 20 (32.3%), atrophic glossitis (AG) in 15(24%) cases, burning sensation in 4(2.2%), angular cheilitis in 2(1.1%), oral pigmentation in 2(2.2%), periodontitis in 1 case, ulcer in 6(15%), oral candidiasis 4(5%), and pale mucosa in 6(16%) of study samples. There was no significant correlation seen between the ferritin (P=0.172) and Hb (P=0.779) with pale oral mucosa. The comparison between cases and health subjects was shown in **Table 1**. Fissured tongue and AG are the most common signs and have the highest rates.

Table 1 Comparison between cases and healthy subjects.

		IDA (No.=60)		Healthy controls (No.=120)		*P* (Student *t*- test)
		Mean±SD	Range	Mean±SD	Range	
Hb (g/dL)	Male	10.6±1.9 (n=18)	6.9–12.7	15.1±0.7 (n=36)	13.8–16.3	<0.001
	Females	10.5±1.3 (n=42)	7.1–11.9	13.6±0.8 (n=84)	12.2–15.2	<0.001
MCV (FL)		78.3±8.5	57.9–103.8	90.9±3.2	82.4–98.6	<0.001
RDW (%)		15.8±2.4	12.1–23.5	12.9±0.5	11.7–14.8	<0.001
Mentzer index		18.4±3.6	12.2–33.1	20.2±1.6	16.0–25.1	<0.001
G&K index		92.1±16.8	57.2–145.2	77.8±6.2	65.4–90.1	<0.001
Iron (µg/dL)	Male	30.4±14.3 (n=18)	10–55	99±22 (n=36)	69–149	<0.001
	Females	31.2±13.4 (n=42)	10–58	97±27 (n=84)	60–204	<0.001
TIBC (µg/dL)		398.3±67.6	207–527	307.9±33.9	228–384	<0.001
Vitamin B12 (pg/mL)		544.7±278.9	150–1000	646.6±211.1	259–1000	0.003
Folic acid (ng/mL)		13.0±6.3	2.8–24	13.6±5.7	4.1–24	0.473
Homocysteine (µm)		8.7±5	3.6–39.9	8.1±2	4.3–13.4	0.202

Discussion

Up to our knowledge, this is the first study conduct to assess the rate of oral signs of IDA in Iraq. The mean Hb concentration in men higher than in women, with insignificant value. This Hb was less than that recorded by Wu *et al*.[3] they recorded males with Hb=10.6 g/dl and women with Hb=10.5 g/dl. This difference attributed to different in the size of sample.

In the present study, according to the symptoms observed in patients; mild anemia is frequent while severe and moderate anemia presented in relative fashion; this is predictor of that anemia was not as threaten as in the study by Lu[5] in 2016. He documented that 16% of cases had life-threatening anemia, 40% of cases in severe form and 24% of patients were in moderate form. While he recorded 20% of cases within mild phase.

There was no association between Hb and the diagnosis of the oral thrush. This dislike with Nayak *et al*.[13] who said that anemia lead to develop oral depletion signs when Hb dropping to <7 g/dl. The reasons beyond that is the lack of awareness of nutrients, life style, fewer raw food use and vegetables, and carelessness towards eating habits.

Frequently, oral manifestation seen was fissured tongue in 20(32.3%) cases. Nayak *et al*[13] found pale fissured tongue in 20.51% of cases.

In this study, there was no association between ferritin and Hb with pale oral mucosa. This dissimilar with Shrotriya and Shrotriya.[14] They reported a strong correlation between manifestations of oral depletion and hematological depletion. They concluded that some signs as cheilitis and glossitis were indicators of IDA in late phase. This disappointment might be because of more severe anemia distinguished in Indian cases,[14] than in this study.

Several limitation can be noticed in this study. Firstly, small sample size. Secondly, un-nationality study. Thirdly, uni-center study. Fourthly, un-randomization. Fifthly, short period of this cohort.

Conclusion

Through this research, information was added to us about the effects of anemia on the oral cavity and the lesions and through it we can reach the correct diagnosis and treatment early for reducing the harmful events of anemia.

References

1. Joosten E. Iron deficiency anemia in older adults: A review. Geriatrics & Gerontology International, 2018;18(3), 373–379.
2. Warner MJ, Kamran MT. Iron Deficiency Anemia. [Updated 2022 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK448065/?report=classic
3. Wu YC, Wang YP, Chang JY, Cheng SJ, Chen HM, Sun A. Oral manifestations and blood profile in patients with iron deficiency anemia. Journal of the Formosan Medical Association (JFMA). 2014;113: 83–87.
4. Derossi SS, and Raghavendra S. Anemia. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology Endodontics. 2003;95(2):131-41.
5. Lu SY. Perception of iron deficiency from oral mucosa alterations that show a high prevalence of Candida infection. J Formos Med Assoc. 2016; Aug;115(8):619-27.
6. Liu K, Kaffes AJ. Iron deficiency anemia: a review of diagnosis, investigation and management. Eur J Gastroenterology. Hepatology. 2012; 24: 109-116.
7. Killip S, Bennett JM, Chambers M. Iron Deficiency Anemia. Am Fam Physician. 2007; 75: 671-678.
8. Geisel T, Martin J, Schulze B, Schaefer R, Bash M, Virgin G, Stein J. An Etiologic Profile of Anemia in 405 Geriatric Patients. Hindawi Publishing Corporation. 2014;10.1155.
9. Goddard AF, James MW, McIntyre AS, Scott BB. Guidelines for the management of iron deficiency anemia. Gut. 2011; 60: 1309-1316.
10. Sari A, Pamungkasari EP, Dewi YLR. The addition of dates palm (Phoenix dactylifera) on iron supplementation (Fe) increases the hemoglobin level of adolescent girls with anemia. Bali Medical Journal 2018; 7(2): 356-360. DOI: 10.15562/bmj.v7i2.987
11. Tala ZZ, Darlan DM, Tantono J, Arrasyid NK. Accuracy in measuring hemoglobin concentration using portable hemoglobin meter method. Bali Medical Journal. 2017; 6(1): 121-124. DOI: 10.15562/bmj.v6i1.395
12. Camaschella C. Iron-Deficiency Anemia. N Engl J Med. 2015; 372:1832-1843.
13. Nayak P, Nayak S, Donoghue M. Prevalence and Oral Manifestations of Iron Deficiency Anemia: A Short Study, Sushruth, & Donoghue; Mandana. Medico-Legal Update, 2011.
14. Shrotriya A, Shrotriya A. Oral Manifestations in Iron Deficiency Anemia. Journal of Advanced Medical and Dental Sciences Research. 2018;23(21):95-99.