American Journal of Otolaryngology and Head and Neck Surgery

Case Report
Published: 22 Mar, 2021

Red Cell Distribution Width with Clinical Significance of B12 Deficiency Anemia: A Mini Case Report

Surajit Bose[1], Sumantro Banerjee[1], Jayanta Chattopadhyay[1], Mousum Manna[2] and Vertika Rai[3]*

[1]Department of Oral Pathology, KSD Dental College and Hospital, India

[2]BC Roy Technology Hospital, IIT, India

[3]IIT Kharagpur, India

Abstract

In routine hematological procedure MCV, RDW needs to be thoroughly investigated, as it may be a useful indicator in diagnosis of suspected megaloblastic anemia with related oral manifestations, secondary to vitamin B12 malabsorption, and thereby guides the further management.

Keywords: RDW; MCV; Hemoglobin; Vitamin B12 and Folate assay; Iron profile; Anemia; Glossitis

Abbreviation

RDW: Red Cell Distribution Width; MCV: Mean Corpuscular Volume; PA: Pernicious Anemia

Introduction

Vitamin B12 (cobalamin) is an important coenzyme for DNA synthesis and erythrocyte production and differentiation, and is essential for normal neurological function. B12 deficiency may lead to megaloblastic anemia, epithelial abnormalities in the digestive tract mucosa, and severe neuropsychiatric damage [1]. Glossitis secondary to Vitamin B12 deficiency anemia most commonly results from malabsorption syndrome (primarily because of a lack of intrinsic factor) or inadequate consumption of the vitamin [2]. Older people and people with a vegetarian diet are at the highest risk for this form of anemia; up to 20% of older adults have been reported to have the condition [2,3]. Glossitis is present in up to 25% of cases, 3 initially presenting as inflammatory changes characterized by bright red plaques; it may then evolve into the atrophic form, noted as atrophy of the lingual papillae, affecting more than 50% of the tongue's surface [3]. Reported oral symptoms include a burning sensation, pruritus, lingual paresthesia, glossodynia and dysgeusia [4]. Complete hematological screening and monitoring of RDW could be useful in patients with suspected vitamin B12 deficiency [5,6]. Treatment is usually lifelong intramuscular or oral administration of vitamin B12.

On the other hand RDW (Red Cell Distribution Width) and MCV (Mean Corpuscular Volume) are the important parameter for detecting chronic anemia, HbE trait, aplastic anemia, Fe deficiency, Folate and Vitamin B12 deficiency anemia also.

Case Presentation

A 56 year-old woman presented with eight months history of persistent burning sensation on her tongue and mouth. The patient was not taking any medications and had not been exposed to any new foods or oral hygiene products at the time her symptoms began. In her medical history nothing significant was found except anemia and she was taking Iron therapy for some years but was not remarkably change in Hemoglobin percentages. Our provisional clinical diagnosis was glossitis.

Laboratory investigations to rule out underlying hematologic diseases showed Hb%: 9.8 g/dl, high MCV value and increased RDW (21.5 [normal 11% to 16%]) suggested nutrient deficiency of iron, folic acid or Vitamin B12. Blood test of Iron study showed Transferine saturation 56.8% (Normal value 20% to 50%), Total Iron 137.12 µg/dl (Normal value Female 60 to 180) and TIBC 241.15 µg/dl (Normal value Adult 255 to 480 µg/dl). On the other hand vitamin B12 (78.61 [normal 189 to 883] pg/mL), and Folate 9.21 ng/ml (Normal value 2.3 to 24.8). So here we concluded that the patient having normal level of Iron and Folic acid on the contrary Transferine indicated higher

OPEN ACCESS

***Correspondence:**
Surajit Bose, Department of Oral Pathology, KSD Dental College and Hospital, India,
E-mail: sur.bose76@gmail.com

Received Date: *25 Feb 2021*
Accepted Date*: 18 Mar 2021*
Published Date*: 22 Mar 2021*

Citation:
Bose S, Banerjee S, Chattopadhyay J, Manna M, Rai V. Red Cell Distribution Width with Clinical Significance of B12 Deficiency Anemia: A Mini Case Report. Am J Otolaryngol Head Neck Surg. 2021; 4(3): 1126.

Figure 1: Before Treatment tongue and buccal mucosa PC: Dr. Surajit Bose.

Figure 2: After treatment complete remission of the lesion PC: Dr. Surajit Bose.

than normal level due to long term Iron therapy and it more towards the case of vitamin B12 deficiency anemia.

The patient was started her treatment and She received a single injection (1000 µg) of vitamin B12 and the normal clinical appearance of her tongue after 3 days, follow up medicine of capsule Methylcobalamin 1500 mcg for 3 months and 500 mcg for next 3 months resulted in complete resolution of her symptoms. After 3 months of therapy the vitamin B12 levels goes up to 223 pg/mL.

Discussion

Glossitis and glossodynia are classic symptoms of vitamin B12 deficiency [7]. It is important for clinicians to be aware of these symptoms in conjunction with other oral signs such as erythematous patches, angular cheilitis, recurrent oral ulcers, oral candidiasis, and a burning mouth. A deficiency of vitamin B12 rarely results from a lack of animal protein in the diet but commonly from malabsorption. Inadequate B12 absorption often originates from a deficiency of intestinal cobalamin transport proteins or impaired synthesis of an intrinsic factor due to severe gastrointestinal diseases, a gastrectomy, or Pernicious Anemia (PA). The intrinsic factor is a glycoprotein secreted by gastric parietal cells, and is necessary for the absorption of vitamin B12 in the distal ileum. Despite many causes, Pernicious Anemia (PA) is now believed to be the most common cause of vitamin B12 deficiency. Although the disease is silent until the last phase, a wide spectrum of oral, gastrointestinal, hematological, and neuropsychiatric manifestations can be predicted many years before anemia develops [8-9]. However, dental practitioners and medical doctors often ignore the oral manifestations and changes in the Red blood cell Distribution Width (RDW) and Mean Corpuscular Volume (MCV) until the hemoglobin level is very low.

The usefulness of RDW, an index of red blood cell heterogeneity in the classification and workup of microcytic anemia from iron deficiency has been well documented [10-15]. It has also been suggested that the increase in the RDW precedes the increase in MCV in megaloblastic anemia and can therefore serve as a sensitive index of early deficiency [15-17].

Thus, physicians should pay special attention to oral manifestations during medical history taking and physical examination in high-risk populations such as the elderly, vegetarians, and patients with digestive problems or prolonged exposure to drugs that could cause B12 malabsorption.

References

1. Gröber U, Kisters K, Schmidt J. Neuroenhancement with vitamin B12-underestimated neurological significance. Nutrients. 2013;5(12):5031-45.
2. Ryan-Harshman M, Aldoori W. Vitamin B12 and health. Can Fam Physician. 2008;54(4):536-41.
3. Gupta AK, Damji A, Uppaluri A. Vitamin B12 deficiency. Prevalence among south Asians at a Toronto clinic. Can Fam Physician. 2004;50:743-7.
4. Graells J, Ojeda RM, Muniesa C, Gonzalez J, Saavedra J. Glossitis with linear lesions: An early sign of vitamin B12 deficiency. J Am Acad Dermatol. 2009;60(3):498-500.
5. Gulai Aktas. Actamedica Anatolia. 2014;2(1).
6. Ravi Sarma P. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd Ed. Chapter 152 Red Cell Indices.
7. Tyldesley WR. Oral signs and symptoms in anemias. Br DentJ. 1985;139:232-6.
8. Lindenbaum J, Healton EB, Savage DG. Neuropsychiatric disorders caused by cobalamin deficiency in the absence of anemia or macrocytosis. N Eng J Med. 1988;318(26):1720-8.
9. Snow CF. Laboratory diagnosis of vitamin B12 and folate deficiency. Arch Intern Med. 1999;159(12):1289-98.
10. Dharmarajan TS, Norkus EP. Approaches to vitamin B12 deficiency: early treatment may prevent devastating complications. Postgrad Med. 2001;110(1):99-105.
11. Bessman JD. Heterogeneity of red cell volume: Quantitation, clinical correction, and possible mechanisms. Johns Hopkins Med J. 1980;146(6):226-30.
12. Bessman JD, Feinstein DI. Quantitative anisocytosis as a discriminant between iron deficiency and thalassemia minor. Blood. 1979;53(2):288-93.
13. Johnson CS, Tegos C, Beutler E. Thalassemia minor: Routine erythrocyte measurements and differentiation from iron deficiency. Am J Clin Pathol. 1983;80(1):31-6.
14. McClure S, Custer E, Bessman JD. High RDW is the earliest predictor of iron deficiency. Blood. 1983;62(suppl 1):51a.
15. Marti HR, Fischer S, Killer D, Burgi W. Can automated haematology analysers discriminate thalassemia from iron deficiency? Acta Haemat. 1987;78(2-3):180-3.
16. Karnad A, Poskitt TR. The automated complete blood cell count. Use of the red blood cell volume distribution width and mean platelet volume in evaluating anemia and thrombocytopenia. Arch Intern Med. 1985;145(7):1270-2.
17. Roberts GT, Badawi SB. Red blood cell distribution width index in some hematologic diseases. Am J Clin Pathol. 1985;83(2):222-6.
18. Bessman JD, Gilmer PR, Gardner FH. Improved classification of anemias by MCV and RDW. Am J Clin Pathol. 1983;80(3):322-6.