

Anemia And It's Oral Manifestation

Dr.N.Anitha¹,P.Appadurai²

- 1.Reader, Department of Oral Pathology and Microbiology , SreeBalaji Dental College and Hospital,Bharath Institute of Higher Education and Research, Chennai
- 2.Undergraduate student, SreeBalaji Dental College and Hospital ,Bharath Institute of Higher Education and Research, Chennai

Corresponding author
Dr.N.Anitha

Reader, Department of Oral Pathology and Microbiology, SreeBalaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Chennai
Mail id:dranitha.nnr@gmail.com
Phone no:9884472470

Abstract:-

Oral cavity is the mirror of systemic health. Anemia is one such condition, which manifests itself in oral cavity. Anemic disorders such as Iron deficiency anemia, Plummer vinson syndrome, Sickle cell anemia, Thalassemia and Aplastic anemia affects oral cavity significantly. The common manifestation of anemia include pale mucosa, angular cheilitis, glossitis, dysphagia, stomatitis etc. Mostly the manifestations are non-specific.

Keywords.Anemia, Iron , Red cells, Hemoglobin.

INTRODUCTION:-

Anemia is a reduction in the total erythrocyte count in the peripheral circulation. The functional outcome of anemia is a decrease in the oxygen-carrying capacity of blood that leads to tissue hypoxia.¹ According to WHO reports , one third of the global population are anemic due to imbalance in their nutritious food intake. India contributes to about 80% of the maternal deaths due to anemia². The common oral manifestation of anemia are angular cheilitis and depapillation of tongue.³

CLASSIFICATION OF ANEMIA

Pathophysiologic Classification⁴

Anemia due to blood loss

- a. Acute posthaemorrhagic anemia
- b. Anemia due to chronic blood loss

Anemia due to impaired red cell formation

- a.Cytoplasmic maturation defects
 1. Deficient haem synthesis: Iron deficiency anemia
 2. Deficient globin synthesis: thalassemia
- b. Nuclear maturation defects
 1. Vitamin B12/Folic acid deficiency: Megaloblastic anemia
- c.Defect in stem cell proliferation & differentiation
 2. Aplastic anemia
 3. Pure red cell aplasia

- d. Bone marrow failure due to systemic diseases
1. Anemia of inflammation
 2. Anemia in renal disease
 3. Anemia due to endocrine & nutritional deficiencies
 4. Anemia in liver disease

- e. Bone marrow infiltration
1. Leukaemias
 2. Lymphomas
 3. Multiple myeloma

- f. Congenital anemia
1. Sideroblastic anemia
 2. Congenital dyserythropoietic anemia
 - 3.

Anemia Due To Increased Red Cell Destruction

1. Intracorpuseular defect
2. Extracorpuseular defect

MORPHOLOGIC CLASSIFICATION¹

Based on red cell size, haemoglobin content & red cell indices

1. Microcytic, hypochromic: Iron deficiency anemia, sideroblastic anemia, Thalassemia, Anemia of chronic diseases
2. Normocytic, normochromic: Acute blood loss, haemolytic anemia, Bone marrow failure.
3. Macrocytic, normochromic: Megaloblastic anemia

Signs And Symptom:-

Anemia has fatigueness as a common symptom. Fatigue (tiredness) occurs due to reduced oxygen to the cells or low haemoglobin. The oxygen carrying capacity is reduced ultimately. Shortness of breath, dizziness, headache, pale skin and chest pain are the other symptoms⁵. It is found that women are more frequently affected by anemia due to blood loss associated with menstrual flow¹.

In infants anemia manifests poor appetite, slow growth and development and behavioral problems⁶. In iron deficiency, blue discoloration of sclera (due to thinness and transparency of the collagen fibres of the sclera that allows visualization of the underlying uvea) may be noticed. Restless leg syndrome is seen commonly in Iron deficiency anemia. Thalassemia shows bone deformities and leg ulcers are seen in sickle cell anemia.⁵

In severe anemia, to compensate the decreased oxygen levels there will be increased cardiac output and patient will have symptoms such as palpitations, angina (if pre existing heart disease is present), intermittent claudication of legs and symptoms of heart failure. Also severe anemia may show signs of hyperdynamic circulation such as tachycardia, bounding pulse, flow murmurs and cardiac ventricular hypertrophy.⁷

ORAL MANIFESTATIONS OF ANEMIA:-

Anemia due to decreased production of red cells

Pernicious anemia/vitamin B12 deficiency anemia.

Pernicious Anemia is an autoimmune atrophic gastritis that leads to the deficiency in Vitamin B12 due to its malabsorption, this malabsorption is the result of deficiency of intrinsic factor, a protein that promotes its transport to the terminal ileum for absorption.⁸ Intrinsic factor is

necessary for the absorption of vitamin B12, which in turn is necessary for the formation of red blood cells⁹.

The patients with pernicious anemia usually complain of burning sensation in the lips, mucosa and tongue (glossopyrosis). The tongue and mucosa may be smooth (because of papillary atrophy in case of tongue) or may have patchy areas of erythema. In literature, cases with aphthous like ulcerations, dysphagia and taste alteration have also been reported.¹⁰

Aplastic anemia:

Aplastic anemia is a serious and often fatal hematologic disorder, which is characterized by hypoplastic bone marrow and peripheral pancytopenia. It is a rare and potentially life threatening disorder, which is caused by destruction of pluripotent stem cells in the bone marrow, thus giving rise to symptoms caused due to anemia, thrombocytopenia and neutropenia¹¹. The oral manifestations of aplastic anemia may be the very first clinical symptoms of the disease and are directly associated to pancytopenia. The common features include petechial purpuric spots or frank mucosal hematomas of oral mucosa at any site, while gingival hemorrhage may be seen in some cases, these findings are seen because of platelet deficiency. Ulcerative lesions of oral mucosa and pharynx are seen as the result of lack of resistance of infection due to neutropenia¹².

ANEMIA DUE TO BLOOD LOSS

Iron deficiency anemia

Iron deficiency anemia is characterized by incomplete synthesis of haemoglobin that results in microcytic and hypochromic red blood cells. Due to inadequate haemoglobin, there is reduction in the ability of blood to deliver oxygen to the other body cells and tissues.¹⁰ Glossitis, glossodynia, angular cheilitis, erythematous mucositis, oral candidiasis, recurrent oral ulcers and burning mouth are the common oral complaints in iron deficiency anemia.¹⁴

Plummer Vinson Syndrome

It is also known as Patterson–Brown–Kelly syndrome, and is characterized by iron deficiency anemia along with atrophic glossitis or angular cheilitis and dysphagia due to pharyngoesophageal ulcerations and esophageal webs. It is also associated with koilonychia or spoon shaped nails.¹⁵

Sickle Cell Anemia

It is characterized by a hemoglobin gene mutation, in which there is replacement of amino acid glutamic acid by valine, in the sixth position on the β -hemoglobin chain. As a result, the normal biconcave discoid shape of erythrocytes is lost and obtains sickle shape and its normal lifetime of 120 days is reduced to 14 days.⁶ It is characterized by various oro-facial manifestations which include, “step-ladder” trabeculae pattern enamel hypomineralization, calcified canals, diastema, increased overbite and increased overjet¹⁶. Anesthesia or paresthesia of the mental nerve¹⁷ and asymptomatic pulp necrosis may also be seen.¹⁸ Osteomyelitis of mandible is one common complication¹⁹. Interruption of blood supply may lead to anesthesia of inferior alveolar nerve²⁰.

Thalassemia

Thalassemia is an inherited blood disorder in which the body produces an abnormal form of hemoglobin which results in excessive destruction of red blood cells. The oral manifestation of thalassemia include overdevelopment of maxilla and mandible secondary to bone marrow hyperplasia, which leads to prominent cheekbones, sunken nose and labially inclined maxillary incisors, giving rise to incompetent lips, this representation is referred to as “rodent or chipmunk facies”²¹

CONCLUSION:-

A large number of systemic disorders have oral manifestations, which sometimes could be the first symptoms of the disease. Anemia is one such condition, which manifests itself orally before any other systemic symptoms. Most of the manifestations are non-specific, but should alert the

hematologist and the dental surgeon to the possibilities of a concurrent disease of hemopoiesis or hemostasis or a latent one that may subsequently manifest itself. These manifestations must be properly recognized for the patient to obtain appropriate diagnosis and referral for treatment. Proper diagnosis is essential to initiate the correct treatment.

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