Case Report

SCURVY AS A PREDISPOSING FACTOR IN GINGIVAL DISEASE — A CASE REPORT

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ABSTRACT

Scurvy is a vitamin C deficiency disease which mainly occurs in teenagers. Vitamin C plays a vital role in the synthesis of collagen, the deficiency of which leads to a widespread pathology of supporting tissues of blood vessels, bone and teeth.

There is an increased permeability of the capillaries to red blood cells causing hemorrhage. The bone becomes friable at the growing end. There is interference with timely collagen formation which causesdelayed wound healing. In addition to other symptoms, there are bleeding gums, loose teeth plus swollen and stiff joints.

A case report of a 13 years old girl is presented with gingival swelling and bleeding since last 4 years.The case was thoroughly investigated, oral prophylaxis along with vitamin C was prescribed and the patient became normal within one week time.

Key Words: *Scurvy, Nutrition deficiency disease, Gingival bleeding and swelling.*

INTRODUCTION

Scurvy, also called vitamin C deficiency, generally affect the teenagers today.[1,2] It is caused by prolonged dietary lack of vitamin C, a nutrient found in many fresh fruits and vegetables, particularly citrus fruits. It takes about 4-8 months to develop clinical signs of scurvy.[2,3] Scurvy has been known since ancient times and documented as a disease by Hippocrates. Egyptians have recorded it symptoms as early as 1550 BC. At one time it was common amongst sailors, pirates and others aboard ships at sea for greater times than perishable fruit and vegetables could be stored.[4,5]

An understanding of the cause and remedy for scurvy grew from one of the experiences of the British sailors in the 18th century when English sailors became progressively ill after long voyages at sea.[2,6] It was only with the observation that consumption of fruit help to ward off the devastating effects of scurvy. The sailors began to transport limes with them.[5] The incidence of scurvy has dramatically reduced since the discovery of its link to the dietary deficiency of ascorbic acid.[5] But sporadic reports of scurvy still occur, particularly in the elderly, malnourished, alcoholics and food faddists.[4,7]

Vitamin C is needed for a variety of biosynthetic pathways by accelerating hydroxylation and amidation reactions. It plays a vital role in the synthesis of collagen where ascorbic acid is required as a cofactor for prolyl hydroxylase and lysyl hydroxylase. These two enzymes are responsible for the hydroxylation of proline and lysine to form hydroxyproline and hydroxylysine which are important for stabilization by cross linking the propeptide in collagen.[1,2,8] The deficiency leads to an inability of producing and maintaining the intercellular ground substance as collagen is a component of all fibrous tissue i.e. the matrix of bone, cartilages, dentine and all non epithelial cement substance especially of vascular endothelium.[1,2,9] As a result, there is widespread pathology of supporting tissues of the blood vessels, bone and teeth. There is increased permeability of the capillaries to red blood cells causing hemorrhages. New bone formation stops due to impaired osteoblastic function, but as bone absorption still goes on, the bone becomes friable at the growing end, in addition to interferences with

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timely collagen formation causing delays in wound healing.[2,10,11,12] Vitamin C is a potent antioxidant that helps to protect cells against damage and also has important role in immunity. Vitamin C helps the body to absorb iron and acids, which are imperative in the synthesis of some hormones and brain neurotransmitters.[1,2,13]

The clinical symptoms of scurvy are gradual weakness, pale skin, sunken eyes, muscle pain, tender swollen bleeding gums with loose teeth, sore swollen and stiff joints in the lower extremities.[7,9,14] Bleeding can also occur under the skin, sometimes in the nail bed and deep tissue. Hemorrhage around hair follicles often results in scaly skin. There is also increased risk of infection and poor wound healing, exhaustion, fainting, diarrhea, lung and kidney problems. Children and infants with an ascorbic acid deficiency have unusually poor bone growth and anemia.[13,15] With advancement in the understanding of the disease, general improvement in health standard and nutrition, scurvy is now rarely encountered.[4] However scurvy still exists in industrialized societies as well as in underdeveloped countries, but when recognized, is an easily treatable disease.[7] People at higher risk are nowadays smokers, people who drink large amount of alcohol, elderly and institutionalized people who avoid fruits and vegetables,[4,6,7,16] people under stress and infants taking cow's milk instead of infant formula which is fortified with vitamin C.[12,13]

Vitamin C deficiency does not cause an increase in the incidence of gingivitis and periodontitis but it does increase the severity of gingivitis.[12,13,15] Vitamin C deficiency may aggravate the gingival response to plaque, worsen the edema and cause bleeding of the gums. This exaggerated response is partially by host bacterial interaction and partially by the deficiency of vitamin C.[17] If left untreated, gingivitis will eventually lead to periodontal disease, inhibit fibroblast formation and its differentiation into osteoblasts and impair collagen formation and ground substance,which is the major cause of tooth and bone loss.[12,13,15]

Charbeneao[17] et al reported worsening of preexisting moderate periodontitis with the development of scurvy. In a retrospective analysis of 12,419 adults studied in the 3rd National Health and Nutrition Examination Scurvy (NHANES III), Nishida[18] et al found that there was a weak but statistically significant dose-response relationship between the level of dietary vitamin C intake and periodontal disease in current and former smokers as measured by clinical attachment.

Scurvy is differentiated from Leukemia, thrombocytopenic purpura, agranulocytosis, diabeties mainly from medical and dietary history, clinical features, blood and white cell ascorbic acid.[15,17] In infants and children, x-rays may be advised.[16] For full recovery, increased vitamin C level in the diet i.e. rich in citrus fruits, other fruits and vegetables along with supplements of Vitamin Care recommended.[2,6]

CASE REPORT

A 13 year old girl reported to the Department of Periodontology at Khyber College of Dentistry, Peshawar with the chief complaint of "spontaneous gum bleeding and painful swollen gums" since the past 4 years. She mentioned of having been to several dentists before and also gave a history of scaling last year, all of which failed to alleviate her symptoms.

The patient's medical history discounted the presence of any systemic disease, although she did complain of myalgia. Her dietary history revealed that she had not taken any vegetables or fruits since childhood. On general physical examination the patient appeared pale, with sunken eyes and brown pigmentation on her face. Extra oral examination disclosed the presence of angular chelitis where as intra oral examination revealed poor oral hygiene with generalized plaque and calculus. The gingiva appeared fiery red in color and was diffusely swollen with a shiny texture. Several hemorrhagic spots were noted on the gums which bled spontaneously on slight probing. The tongue showed minor aphtous ulcers on its tip and dorsal surface.

Primary treatment of the patient consisted of education about oral hygiene measures, prescription of an anti-microbial mouthwash and was recalled after 1 week. Upon recall she was advised the following laboratory investigations, the results of which are given in Table 1.

Laboratory tests showed the absence of any undiagnosed blood disorders. The only conclusive findings were of Iron deficiency anemia and Vitamin C deficiency. Upon obtaining consent from the parents, mechanical debridement of teeth was performed. Oral hygiene instructions were reinforced; Vitamin C tablets 500mg twice a day and Fefol Vit tablets once daily were prescribed. The patient was recalled after one week for the second visit of mechanical therapy. There was visible improvement in the patient's gingival health which can be seen in Figure 2. The minor apthous ulcers and angular chelitis also appeared to be receding.

Table 1: Laboratory investigations

Hemoglobin	10.4g/dL
DLC	
Neutrophils	43%
Lymphocytes	46%
Eosinophils	6%
Monocytes	0.5%
Reticulocytes count	1.3%
Platelet count	312 x 10^9/L
Anti HCV	Negative
Anti HBS	Negative
RBS	115mg/dL
RBC morphology	
Hypochromia	+
Macrocytosis	+
Anisocytosis	++
Microcytosis	+
Vitamin C assay	0.1mg/dL

Fig. 1: Intra oral view showing bad oral hygiene, abundant plaque and fiery red diffusely swollen gingival

Fig. 2: Intra oral view showing marked improvement in oral hygiene and gingival health

DISCUSSION

Vitamin C deficiency has long history.[2,6] The relationship between the deficiency of vitamin C in the diet and its clinical findings are well established. It is a rare but serious disease and its existence in the literature is still well documented.[10,11,14] Few cases of scurvy have been reported in 21st century which mainly occurred in the neglected elderly, chronic alcoholics, institutionalized and food faddist.[2,5,15]

This case report described scurvy in a 13 year old girl with underlying self imposed eating and obsessive compulsive disorder. She presented with anemia, stomatitis, lethargy, spontaneous bleeding and swollen gums. These are the classical features of scurvy, which have been documented in many other studies.[12,13,14,19]

Scurvy does not cause gingivitis or periodontitis but her poor oral hygiene with generalized plaque and calculus aggravated the gingival condition. This role of local irritants has been established by several researchers.[4,12,13,15,20] Her angular chelitis and oral stomatitis in the form of minor aphthous ulcer matched with the level of hemoglobin and morphology of red blood cells, which has also been reported in literature.[6,16,19] Patient initially refused to undergo mechanical debridement because of the past experience. But after counseling she agreed to the proposed treatment. She was prescribed oral vitamin C along with Iron and folic acid therapy (Fefol vit) which lead to dramatic improvement in her overall general and oral condition.

CONCLUSION

This case will serve as a reminder to the clinician that despite its rare occurrence, ascorbic acid deficiency still persists in the 21st century. Once diagnosed, it is an easily treatable disease. Doses of Vitamin C higher than the Recommended Daily Allowance (RDA) have been suggested for the treatment of scurvy.

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