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A Modern Day Case of Scurvy

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Abstract

Ascorbic acid (Vitamin C) is an essential dietary nutrient. Humans rely on exogenous sources of vitamin C as they are unable to produce their own. Vitamin C is utilized for many functions in the body. When humans are without Vitamin C for extended periods of time, they may develop scurvy. Symptoms of scurvy include follicular hyperkeratosis, ecchymoses, leg edema, gingival swelling, gum discoloration, oral hemorrhage, perifollicular hemorrhage, poor wound healing, and bent/coiled body hairs. Most cases of scurvy are seen in the developing world where access to vitamin C containing food may be limited or in individuals with absorption issues. However, cases, while rare, still occur in developed countries. In this case study, we discuss a 61-year-old female who presented with easy bruising and fatigue and was later diagnosed with scurvy. This patient had undetectable levels of vitamin C. This case was unique for a variety of reasons. First, the patient's vitamin C levels remained undetectable despite being on a large dose oral supplementation of Vitamin C for an extended period of time.

Additionally, the patient had isolated skin involvement. The patient did not experience typical manifestations of scurvy such as hemorrhage and mucosal involvement. We present this case given the rarity of scurvy in the United States and the unique presentation of this patient.

Keywords: Ascorbic acid (Vitamin C); scurvy

Introduction

Ascorbic acid, also known as vitamin C, is an essential dietary nutrient. Humans are unable to produce their own vitamin C and rely solely on exogenous sources [1]. The human body relies on Vitamin C for many functions. Vitamin C is a cofactor in collagen synthesis. Inadequate collagen results in poor wound healing and issues with bone formation. Vitamin C has antioxidant properties, which protect against cellular damage [2,3,4].

Without Vitamin C, patients may develop scurvy. Scurvy typically first presents with fatigue. Patients with scurvy may present with follicular hyperkeratosis, ecchymoses, leg edema, gingival swelling, gum discoloration, oral hemorrhage, perifollicular hemorrhage, poor wound healing, and bent/coiled body hairs [1]. Patients with scurvy commonly complain of back and joint pain. This could be a result of hemorrhage into the soft tissue and joints. Laboratory values associated with scurvy include anemia, leukopenia, and decreased vitamin C [1].

Scurvy is typically associated with the developing world; however, cases, while rare, still occur in developed countries. Patients who

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suffer from alcoholism, mental illness, poor elderly, and institutionalized patients often lack access to food containing vitamin C, making them at risk for scurvy [5,6].

Case Report

We present the case of a 61-year-old female who presented with easy bruising and fatigue and was later diagnosed with scurvy.

A 61-year-old female with a past medical history significant for anemia requiring iron supplementation and infusion, GI bleed, non-bleeding internal hemorrhoids, gastritis, colitis, hypertension, fatty liver, and hyperlipidemia presented with complaints of fatigue and diffuse easy bruising. The patient also complained of easy bleeding, bilateral extremity weakness, back pain, joint pain, muscle weakness, and chills. Given the patient's history and complaints, the following labs were ordered: iron panel, folic acid, vitamin B12, LDH, pt/aptt, and platelet function studies (which were normal 3 months ago). Significant lab results included a hemoglobin of 10.7, low transferrin, and Vitamin B12 was borderline low. The patient was started on oral iron supplementation and vitamin B12 supplementation. Initial skin findings are in Figure 1 and Figure 2.

Figure 1

Figure 2

At the one-month follow-up, the patient continued to complain of fatigue, easy bruising, back pain, and joint pain. Vitamin C levels were ordered, which later came back as undetectable. She was prescribed 1500 mg of Vitamin C, orally. She was unable to report to the clinic for vitamin

C. A repeat Vitamin C was ordered to compare for future visits once the patient has started supplementation. She was scheduled to meet with dermatology given the concern for dermatological manifestation of a potential autoimmune condition. Given this concern, ANA, centromere antibodies, RNA polymerase antibodies, and Scl-70 were ordered. Repeat Vitamin B12 was ordered.

A two-month follow-up was planned; however, the patient did not come back to the clinic until 6 months later. At 6 month follow-up, there was worsening skin bruising primarily on the bilateral forearms and bilateral legs. There was also skin thinning on the bilateral forearms and bilateral legs with veins visible clearly under the skin. At this time, the patient had not seen dermatology yet. An anti-DNA antibody was ordered. vitamin C levels were still undetectable despite the patient taking 1500 mg every day. Given the drastic change in presentation, the patient was advised to stop taking iron supplements but continue her B12 supplements. The following tests were ordered: vitamin C, A/PTT, protamine-INR, and Platelets function tests.

The patient reported to the clinic 1 month later with continued skin thinning and bruising. Most recent lab work showed Vitamin C levels improved to 1.1; however, despite improvement in vitamin C, there was no improvement in patient skin findings. The patient was received intravenous Ascor 200 mg daily for 7 Days and continued to take oral vitamin C. The patient was advised to wear clothes that cover her forearms and legs due to sun exposure.

A dermatology consultation was performed and dermatology did not believe the patient had any autoimmune component to symptoms. Patient skin conditions improved substantially after intravenous vitamin C supplementation (Figure 3 and Figure 4).

Figure 3

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Figure 4

Discussion

Vitamin C deficiency is rare in the United States as most patients are able to receive their vitamin C requirements from their diet. It impacts about 7.1% of the population in the United States [7]. Scurvy is even rarer than vitamin C deficiency. This case of scurvy was unique given the rarity of this disease in the United States as well as the patient's isolated skin involvement. Typically, vitamin C deficiency results in mucosal involvement; such as gingivitis, bleeding gums, and receding gums. However, in this case, the patient experienced diffuse skin thinning and bruising and no mucosal findings.

Scurvy consists of having a serum concentration of vitamin C that is less than 0.2 mg/dL [8]. This patient was unique in that her vitamin C levels were undetectable on more than one blood sample. This indicates that she has severe scurvy.

Patients who suffer from vitamin C deficiency are often given oral supplementation of 300 to 1000 mg/day for one month to improve symptoms [9]. This patient was on 1500 mg of vitamin C daily. Although her vitamin C level improved to 1.1 mg/dL with high-dose oral vitamin C supplementation, the skin manifestations of the disease did not improve. Resolution of symptoms did not occur until IV supplementation of Ascor was completed.

Conclusion

Scurvy is a rare disease that impacts a limited number of individuals in the United States. Given the rarity of the disease and the variance in patient presentation, it is critical to keep vitamin C deficiency on the differential. Moreover, it is important to assess for vitamin C absorption with oral supplementation to ensure improvement of scurvy.

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