American Journal of
Health, Medicine and Nursing Practice
(AJHMN)

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American Journal of Health, Medicine and Nursing Practice
ISSN 2520-4017 (Online)
Vol.7, Issue 12, pp 8 – 11, 2022
www.ajpojournals.org

Scurvy in United States in 2022 – A Rare Nutritional Deficiency which may have been forgotten in the Developed Countries

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Abstract

Purpose: Scurvy is a disease that has ancient relevance but is a rare occurrence in the present times, due to the advancements in studies and convenient access to professional nutritionists and other services that provide guidance and plans to fulfil all nutritional requirements. In this case report, the authors present the case of a 68 year old male who was diagnosed with scurvy. The diagnosis and treatment of this disease has seen to be greatly delayed due to the infrequency of the cases reported, causing serious consequences for the patient. Scurvy presents with a variety of symptoms affecting the skin and soft tissues such as perifollicular hemorrhages, petechiae, bruising, and arthalgrias.

Methodology: The patient was prescribed 250 mg vitamin C supplements (also called Ascorbic acid) 3 times a day and was monitored after 2 weeks to note signs of improvements. Physical examination included observing petechial haemorrhages and bruises. Blood test should be recommended to assess vitamin C levels in blood after the prescribed duration of time.

Findings: The signs and symptoms were resolved after regular intake of ascorbic acid supplements for 2 weeks.

Recommendation: The findings signifies the need for consideration of scurvy as a possible diagnosis for petechial rash and easy bruising along with other differentials even during the modern era.

Keywords: *Scurvy, vitamin C, myalgias, anemia*

INTRODUCTION

Vitamin C also known as Ascorbic Acid is a water soluble vitamin absorbed in the distal small intestine and stored in many organs such as the pituitary, brain, eyes, adrenal gland for storage and utilization for production of collagen.(2)Most mammals except apes (including humans) are able to self synthesise Vitamin C in their liver from glucose (1) however humans depend only on natural sources such as broccoli and raw citrus fruits and synthetic formulations of ascorbic acid available in the market. Recommended Dietary Allowance is 75mg/day for adult females and 90mg/day for adult males however, as expected, pregnant females and the elderly have a slightly increased demand as to the above stated numbers.(2)

Scurvy is a nutritional disorder as a result of severe Vitamin C deficiency (1) either due to decreased intake or flawed absorption by small bowel of ascorbic (2) causes, initially, impaired or, later, even total inhibition of collagen synthesis hence resulting in poor wound healing, an increased risk of osteoporosis due to decreased bone matrix formation and a compromised immunity which can prove to be fatal.(1)

Since Scurvy is a multi-system affecting deficiency, a vast presentation of symptoms are observed in clinical practices, of almost all organs, particularly those which are dependant on high collagen synthesis, which ranges from musculoskeletal complaints such as arthralgias and myalgia particularly prominent in limbs to more alarming symptoms such as ecchymoses, petechiae, hemarthroses, hemorrhages as well as corkscrew hair and swollen gums. (2) It is crucial to pick up on the initial symptoms of scurvy to start immediate administration of Vitamin C thus avoiding delays leading to fatal consequences.

Predisposing factors for scurvy include the following:

- Alcohol intake
- Smokers
- Old age (>65 years old)
- Individuals with lower GI tract inflammation diseases
- Individuals with restrictive diets and allergies
- Poor people who can not afford fruits and vegetables
- Individuals that consume only meat and meat products
- Type 1 diabetics who have an increased daily requirement
- Individuals with eating disorders

CASE REPORT

A 68 year old male was presented to our facility because of dyspnea on exertion, fatigue, anemia, and arthralgias of both hip and knee joint. He also showed palpable ecchymosis and petechiae of the lower extremities. He was reported to have vitamin C level undetectable and markedly improved with the resolution of symptoms upon oral vitamin C replacement.

CASE DISCUSSION

Scurvy is a state of dietary deficiency of Vitamin C (Ascorbic Acid). Its early warning signs include weakness and reduced appetite. Prolonged dietary deficiency of Vitamin C may lead to anemia, gingivitis, peripheral hemorrhages, dyspnea on exhaustion, and bruise-like raised bumps at hair follicles along with the hair that appears to be corkscrewed. (3) All these symptoms are in synchronization with the primary role of Vitamin C to form collagen cross-links necessary for the maintenance and repair of tissues. Scurvy is directly associated with the socioeconomic status and dietary intake of an individual. This also proves to be a challenge

while combating scurvy worldwide, especially in refugee camps. The emergency food supplies given in these areas consist of staples, energy sources and protein sources focusing less on micronutrients like Vitamin C. Onset of scurvy in these areas should be prevented by Vitamin C supplements and fortifying current food supplies with vitamin C.

The human body due to nonfunctional L-Gulonolactone oxidase is unable to synthesize vitamin C. This enzyme catalyzes the reaction between L-gulono-1,4-lactone with an oxygen molecule to give L-xylo-hex-3-gulonolactone and hydrogen peroxide. The L-xylo-hex-3-gulonolactone is then converted to hexuronic acid (ascorbic acid) spontaneously. (4) In this review, we focused on how dietary insufficiency of Vitamin C based on its amount consumed, excretion, and utilization can cause scurvy. It occurs only after months of vitamin C deficit diet. Body stores of Vitamin C are approximately 1500 mg. Scurvy occurs when these levels fall below 300 mg and with plasma concentration < 10 micrometer. Recent studies using modern high performance liquid chromatography (HPLC) assay show that healthy individuals have plasma vitamin C concentration of 8 micrometer without developing scurvy. Physical manifestations of scurvy only appear at values as low as 3 to 5 micrometers. (5)This report deals with the case of an individual with all signs and symptoms of vitamin C mentioned above. He was identified with vitamin C deficiency after taking his clinical history which clearly showed poor dietary intake of micronutrients and improvements of his symptoms as he was given vitamin C supplements.

CONCLUSION

Scurvy is usually known as a historical disease that has mostly been eradicated, but it can occur contemporarily in developed countries among poor and elderly patients, those with diets lacking fresh fruits and vegetables. It can also occur in those with a history of alcoholism, mental illness, or chronic illness. (6) Researchers recommend increased intake of vitamin C in the elderly due to increased oxidative stress. (7)

Physicians need to be familiar with the risk factors, signs, and symptoms of scurvy even presently because despite multivitamins and fortified foods being available, it is quite common in the institutionalized elderly population.

RECOMMENDATION

Vitamin C deficiency can be prevented by an adequate intake of fruits and vegetables or by taking the prescribed daily supplements. Routine physical examinations should be encouraged especially in older people who consume a fixed diet, such as those in assisted living facilities.

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