

## Forgotten Nutritional Disorder in an Elderly Woman

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Rec date: Nov 17, 2014; Acc date: Dec 08, 2014; Pub date: Dec 10, 2014

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### Abstract

Ascorbic acid (vitamin C) is an essential vitamin playing a role in oxidation reduction reactions and in the conversion of tryptophan to serotonin. It is essential for collagen formation, norepinephrine synthesis and teeth and bone formation. Vitamin C deficiency manifests as Scurvy which is a fatal disease. In the current era, atypical manifestations are more common than classic descriptors especially in the elderly. We describe a case of an elderly woman with cutaneous haemorrhages, melena and abnormal blood picture with low vitamin C levels all of which improved with vitamin C supplementation.

**Keywords:** Ascorbic acid; Scurvy; Elderly; Haemorrhages

### Introduction

Historic accounts of Scurvy due to vitamin C deficiency can be traced as far back as 300 BC. Symptoms and signs of scurvy were noted in sailors on lengthy voyages. They were treated with lime juice supplements far before the importance of ascorbic acid was described. Scurvy occurs as a result of decreased vitamin C consumption or absorption. Vitamin C is water soluble. Human beings cannot synthesize vitamin C from glucose as gulonolactone oxidase is absent. Ascorbic acid being an electron donor has a high redox potential. It is an essential co-factor for 14 enzymes. The classic clinical features are lethargy, apathy, weakness, fatigue, gingival bleeding, arthralgia, myalgia, easy bruising and peri follicular haemorrhages. Anaemia, low albumin and low cholesterol are the common biochemical abnormalities.

With the discovery of ascorbic acid and understanding of its physiological role in human nutrition, diets have become more balanced with scurvy becoming almost a disease of the past in the Western world. However, recent data indicate that up to 1/3 of the population in the USA obtain less than recommended daily allowance [1]. In contrast, there are not many reports of scurvy nor is it considered a major highlighted health problem in the literature. Sporadic cases keep appearing in literature particularly in high risk groups. We report a case of scurvy and review the literature of this forgotten nutritional deficiency disorder.

### Case Description

A 90-year-old woman presented to medical ward through the emergency department with atypical chest pain after sustaining a mechanical fall. She was feeling weak and tired for about 3 months. She had tarry black stools intermittently but denied any gum bleeding or joint swellings. She didn't have gastrointestinal symptoms to suggest malabsorption. Her history was significant for hypertension, dyslipidemia and Type 2 Diabetes Mellitus. She stated that she was previously investigated for spontaneous bruising but no cause was established. She had no allergies and does not smoke and drinks

alcohol socially. She lives alone at home. She was neither on any anti-platelet medications nor anticoagulants. Physical examination showed extensive superficial subcutaneous hemorrhages on both forearms and neck (Figure 1). On further questioning she confirmed that findings were unrelated to trauma and occurred recurrently over at least last 5 years. Digital rectal examination confirmed melena. Rest of examination was unremarkable.



**Figure 1:** Superficial haemorrhages over neck and forearms in scurvy.

Dietary assessments were incomplete as recall was not possible with the patient in the hospital for a few days already. Her diet had questionable nutritional balance. She said "I don't like citrusy stuff". Hb: 90 g/dL (Normal range: 115-160), hematocrit: 27% (37-47), MCV: 93 fL (83-100 fL), Platelets: 125 × 10<sup>9</sup> (150-400) Ferritin: 518 mcg/L (30-370), and transferrin: 19 mmol/L (13-48). Iron levels and transferrin saturation, B12, folate, coeliac serology, prothrombin time, and international normalized ratio were within normal ranges. ECG and cardiac markers did not prove coronary etiology for the pain.

The concentrations of vitamin C were measured twice and were 1.3 and 1.5 mg/L (4.0-14.0). Cutaneous haemorrhages in the current era are due to many non-nutritional causes with the common ones being secondary to drug usage—anti coagulants and steroid use or Cushing's syndrome. Exanthematous fevers, purpuric disorders, connective tissue disease come up in the differential. Once scurvy was confirmed, our patient received Ascorbic Acid 500 mg/day. A review 6 weeks later showed resolution of the hemorrhages. Melena had resolved. Her

blood counts showed improvement with Hb 107 g/dl, Platelet count  $209 \times 10^9$  and HCT 31%.

## Discussion

Scurvy is regarded mostly as a disease of the bygone era and hence is not often a topic of clinical discussions or teaching. Although much decreased in prevalence, the disease still exists today in the poorly nourished populations. Moreover review of the literature of recent times indicates that characteristic presentation of the disease is getting rarer [2-4]. The physicians not exposed to the disease in their clinical training years are likely underdiagnose scurvy. The characteristic features of superficial hemorrhages; gingival bleeding and cork screw hair follicles with hemorrhages within them along with a supportive dietary history will lead to the suspicion of this disorder. In the developed world, especially the geriatric populations have erratic consumption of health diet. This can be secondary to their frailty to do their own shopping, depending on substandard ready to eat meals and poor dentition. They contribute to nutritional disorders in a broader sense. Water soluble vitamin deficiencies, micronutrient and vitamin D deficiencies are possibly underestimated in the developed world in elderly population. As in our patient, the consumption of vitamin C rich foods can be inconsistent which may lead to a protracted deficiency state and atypical presentation. Whenever there is an unexplained muco-cutaneous hemorrhagic disorder, checking vitamin C should be the part of work up in hematology. An *ex juvantibus* approach may be reasonable in poorer populations in the world where investigations costs are prohibitive where malnutrition is a public health issue.

Vitamin C is used and abused as it is an over the counter medication. It has been used for a variety of diseases like viral flu, ochranosis and as a chemoprotective agent in chemotherapy. Ascorbic acid promotes iron absorption in the small intestine and is added to the iron preparations. It is used as part of treatment in lead, chromium and paraquat poisoning. Vitamin C is excreted through the kidney and excessive amounts can put a burden on the renal tract. Ascorbic acid is

the precursor for oxalate and excessive consumption predisposes to stone formation especially in presence of renal impairment.

Our patient had a non-classical presentation of scurvy. She has an extensive work up in the past for excluding haemophilic/bleeding disorders. The senior author (VRK) saw scurvy in the developing world. Our patient's previous haematological investigations without an explanation for the subcutaneous haemorrhages, previous knowledge and vigilance prompted to scurvy.

We suspect that our patient may have had fluctuating blood concentrations secondary to her dietary habits; this contributed this non-classical presentation. She did not like citrus fruits with an imbalanced dietary intake. She had no other manifest nutritional deficiencies or malabsorption. Latent scurvy should be on the differential radar when subtle manifestations of disease are unexplained.

## Take Home Message

- Although rare scurvy still exists.
- Atypical manifestations are more common.
- Scurvy should be suspected in high risk population with unexplained recurrent bleeding episodes.
- Scurvy is a potentially fatal disease but an easily preventable and treatable condition.

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