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Letter to the Editor

Scurvy of modern age: Rare presentation with pancytopenia

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To the Editor:

We read with great pleasure the article by Khalife et al. published in your esteemed journal where they describe a new face of scurvy in a set of patients presenting with anemia secondary to vitamin C deficiency [1]. The article is of great interest for hematologists and wider pool of internists, describing an under recognized entity in modern age.

We wish to share our similar experience with an attempt to expand the spectrum of hematological presentations in severe vitamin C deficiency. We describe a case of a 69-year-old man who was admitted in the hospital with complaints of extensive lower extremity petechiae and ecchymosis. On further examination, he was noted to have corkscrew hairs on his body. He did not have splenomegaly. He was found to be pancytopenic with depression of all cell lines. He had a white blood cell count of 1.95 × 1000/μL (normal: 3.9–11.0 × 1000/μL), hemoglobin 6.8 mg/dL, hematocrit 21% and platelets of 111 × 1000/μL. His absolute reticulocyte count was 4.0 (inappropriately low for the level of anemia). Prothrombin time was 12.5 s (11.5–14.5 s) and activated partial thromboplastin time was 32.0 (22.0–35.0). He underwent extensive laboratory work up which was essentially normal (Table 1). Bone marrow biopsy done for the patient revealed hypercellular marrow with hemolysis like picture but with no clinical of laboratory findings suggestive of actual hemolysis. By this time patient had required 5 units of packed RBCs transfusion. His previous labs 6 months ago showed normal hemoglobin of 14 mg/dL and normal platelet count. Upon revisiting his history, patient gave information that he has been on restricted diet of oatmeal, haddock and canned green beans for many years. Vitamin C levels were found to be undetectable on laboratory evaluation. Patient was initiated on intravenous vitamin C 2000 mg twice daily and was subsequently discharged from the hospital oral vitamin C 500 mg twice daily. Patient showed remarkable improvement in hemoglobin with gradual resolution of petechiae. At 4 week follow up, patient's hemoglobin and hematocrit improved to 12.3 mg/dL and 38% respectively. Platelet count also returned to normal 258 × 1000/μL. He had complete resolution of his petechiae and ecchymotic lesions.

Vitamin C deficiency is rare in the modern world and is currently limited to food faddist, tea and toast syndrome, undernourished, alcoholics, elderly, and homeless; since vitamin C cannot be produced in human body [2]. Vitamin C deficiency appears to play an important role in pathogenesis of nutritional anemia and it can present as anemia regardless of the iron status. We believe that Vitamin C Deficiency is common and under recognized cause of anemia and rarely pancytopenia as in our case. The exact pathophysiology needs to be established. Anemia has been known to be associated with vitamin C deficiency, most commonly due to blood loss resulting from deficits in collagen synthesis. However, scurvy presenting with pancytopenia has not been described in the literature to the best of our knowledge.

Vitamin C is important in the absorption and metabolism of many nutrients that affect production of red blood cells. Vitamin C aids in the conversion of iron from the ferric to ferrous form, which is required for iron absorption from the gastrointestinal tract. Vitamin C also augments the effect of folate in production of red blood cells, and foods rich in vitamin C are often the same foods rich in folic acid [3]. Sehbai et al. recommended Vitamin C and Zinc as a part of de novo anemia work up based on their study where they found vitamin C as the commonest cause of anemia regardless of iron status [4]. They found a strong correlation Vitamin C and zinc deficiency, with anemia; regardless of the body habitus. Vitamin C deficiency also causes inflammatory response, causing a rise in ferritin levels (CRP and ESR elevated in our patient).

In conclusion, anemia has been described in the past to be associated with severe vitamin C deficiency, but pancytopenia as seen in our patient is an extremely rare presentation of severe vitamin C deficiency. Extensive work up for hematological patients with anemia and pancytopenia usually is time and resource intensive [1,5–8]. Vitamin C replenishment is an easy and inexpensive intervention to correct a treatable cause of pancytopenia. Underlying pathophysiological mechanism of vitamin C causing pancytopenia in our patient remains elusive at this point, however anecdotal evidence in similar cases is compelling to consider it as a differential diagnosis during the investigative work up of such cases.

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Table 1
Details of laboratory investigations done as inpatient.

Laboratory test	Value	Reference range
Lactate dehydrogenase	342 U/L	110–210 U/L
Reticulocyte count	4.0%	0.5–2.5%
Haptoglobin	116 mg/dL	16–199 mg/dL
ESR	15 mm/h	0–13 mm/h
C reactive protein	68.7 mg/L	< 8.0 mg/L
Babesia/malaria thick and thin Giemsa smears	Negative	Negative
Direct Coombs test (Direct Antiglobulin test)	Negative	Negative
Glucose 6 phosphate dehydrogenase (G6-PD)	15.1 U/g Hb	8.8–13.4 U/g Hb (difficult to interpret due to blood transfusions)
CMV Viral load	Undetected	Undetected
EBV DNA detection	Undetected	Undetected
Mycoplasma pneumoniae AB IGG	Positive	Negative
Mycoplasma pneumoniae AB IGM	Negative	Negative
Complement C3	115 mg/dL	81–157 mg/dL
Complement C4	33 mg/dL	12–39 mg/dL
Rheumatoid factor	< 30 IU/mL	< 30 IU/mL
ANA	Positive at 1:40 (speckled) Negative at 1:80 and 1:160	
Fecal occult blood	Negative	Negative
Cold agglutinin screen	Non-reactive at 1:16	
HIV 1/2 antibody	Negative	Negative
HCV antibody	Undetected	Undetected
HBV surface antigen	Negative	Negative
Hep B core IGM AB	Negative	Negative
Cryoprotein	None present	None present
ANCA antibody	Negative	Negative
Iron	48 μg/dL	45–160 μg/dL
Iron binding capacity	234 μg/dL	230–404 μg/dL
Transferrin saturation	19%	14–50%
Ferritin	155 μg/L	20–300 μg/L
Vitamin B12	617 pg/mL	> 231 pg/mL
Folic acid	5.3 ng/mL	> 4.7 ng/mL

Conflict of interest

None.

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Amos Lal*, Ajay Kumar Mishra, Kamal Kant Sahu, Mohsen Noreldin
Department of Internal Medicine, 123 Summer Street, Saint Vincent Hospital, Worcester, MA 01608, USA
E-mail addresses: Amos.Lal@stvincenthospital.com, manavamos@gmail.com (A. Lal), Ajay.Mishra@stvincenthospital.com (A.K. Mishra).

* Corresponding author.