An overlook problem in bedridden patients.

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ABSTRACT:

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Scurvy is an ancient disease and it is very uncommon in the modern world. However, there were reports of vitamin C deficiency in patients who had impaired activity of daily living and received inadequate dietary supplement. We report two cases of bedridden patients, who received the same formula of blenderized diet for a year, presented with typical skin lesions and bleeding tendency of scurvy. Their skin lesions improved after vitamin C supplement within a few days and completely resolved after a month. These case series aimed to remind health care providers not to overlook the importance of this trace element which could lead to fatal outcome.

Key words: blenderized diet, corkscrew hairs, Scurvy, vitamin C deficiency

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บทคัดย่อ :

เกศอร ป้องอาณา สุพิชญา ไทยวัฒน์ ภาวการณ์ขาดวิตามินซีในผู้ป่วยที่นอนติดเตียง

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แผนกตจวิทยา โรงพยาบาลพระมงกุฎเกล้า

การขาดวิตามินซีรุนแรงเป็นภาวะที่พบได้ยากในปัจจุบัน เนื่องจากมีความเจริญ ทั้งด้านการแพทย์ สุขอนามัย และโภชนาการที่ดีขึ้น แต่อย่างไรก็ตาม ยังคงมีรายงานถึงการขาดวิตามินซี ในกลุ่มคนไข้ที่ไม่สามารถช่วยเหลือตัวเองได้ และไม่ได้รับสารอาหารอย่างเพียงพอ เราจึงนำเสนอเคสผู้ป่วยที่นอนติดเตียงจำนวนสองเคส ที่มีความคล้ายคลึงกันในแง่ของการได้รับอาหารปั่นสูตรเดิมเป็นระยะเวลานาน และมีอาการแสดงทางผิวหนังที่เข้าได้กับภาวะขาดวิตามินซีรุนแรง รวมถึงภาวการณ์มีเลือดออกง่ายตามผิวหนังและเยื่อบุผิว หลังจากวินิจฉัย ผู้ป่วยได้รับการรักษาด้วยวิตามินซี ทำให้ผื่นผิวหนังดีขึ้นอย่างชัดเจนในระยะเวลา 2-3 วัน และอาการแสดงทุกอย่างหายเป็นปรกติใน 1 เดือน โดยวัตถุประสงค์ของการนำเสนอสองเคสนี้ เพื่อที่จะให้บุคลากรทางการแพทย์เฝ้าระวัง การขาดวิตามินซีในกลุ่มคนไข้เหล่านี้มากขึ้น ซึ่งสามารถทำให้เกิดภาวะแทรกซ้อนที่อันตรายได้

คำสำคัญ : ภาวการณ์ขาดวิตามินซี, อาหารปั่นผสม, corkscrew hairs

Introduction:

Nowadays scurvy is rarely seen in the developed world, however the occurrence of severe form of vitamin C deficiency is still found in patients who have impaired eating habits or chronically ill patients who receive special diets. The clinical findings and dietary history are keys in the diagnosis. Vitamin C supplement is the primary treatment for this potentially fatal but easily curable disease.

Case series:

Case 1: A 29-year-old, bedridden, Thai male who had a history of severe head injury, from motorcycle accident with multiple opened scalp fractures and large subdural hematoma at the left fronto-temporal area, one year ago. He was previous healthy and had no history of alcohol drinking or smoking. The patient had been admitted for rehabilitation. He was in stuporous state and fed by blenderized diet via percutaneous endoscopic gastrostomy (PEG). The current medications are antiepileptic drugs (Valproic acid, Topiramate, Levetiracetam, Pregabalin, Clonazepam), Omeprazole, Sennosides, Magnesium hydroxide, N-Acetylcysteine NAC, Zinc sulfate and vitamin supplements (Vitamin B complex, Folic acid). He had been fed by the same formula of blenderized diet (Table 1).

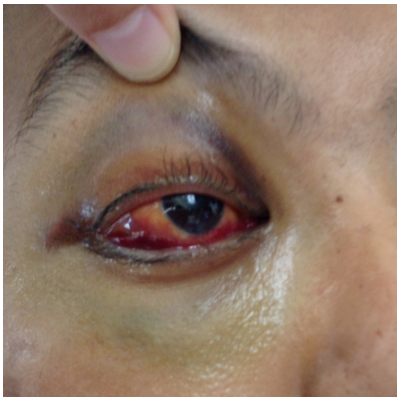

Figure 1 Subconjunctival hemorrhage with periorbital ecchymosis and chemosis both eyes.

Figure 2 Multiple ecchymosis at buccal mucosa and gingivae with loss of teeth and bleeding per gum

Table 1 Shows the contents in 1000 ml of blenderized diet of the patient

Macronutrients	Proportion
Carbohydrate	55%
Protein	15%
Fat	30%

Micronutrients	Proportion (milligrams)
Na	1638.46
K	1092.42
Ca	37.27
P	92.48
Fe	3.07
Cu	0.22
Zn	1.70
B1	0.11
B2	1.45
Niacin	3.2
Fiber	4800

Recipes	Weight (Grams)
Boiled Chinese cabbage	100
Steamed pumpkin	100
Boiled Sea bass	171.36
Boiled Snakehead fish	201.71
Steamed egg-white	349.50
Sugar	96.5
Vegetable oil	31.9
Iodinated salt	3.4

One year after the admission, the caregiver noticed he developed dry and coarse skin texture especially at the proximal part of his arms and legs. A dermatologist was consulted to evaluate the skin problem. Physical examination revealed mild pale conjunctiva with bilateral subconjuctival hemorrhage and periorbital ecchymosis (figure 1), bleeding per gum with loss of lower incisor (figure 2). Other bleeding tendency was noticed as a large ecchymosis on the right elbow and oozing bleeding around the PEG insertion site.

The dermatological examination revealed multiple follicular papules with keratotic plugs and perifollicular purpura on the upper part of arms and forearms. Corkscrew hairs were identified on both arms (Figure 3,4). However, his scalp showed normal hair shafts and hair pulling test was negative. Terry white nails with splinter hemorrhage were noted at the distal parts of his nail beds. The other physical examination appeared normal.

Figure 3 Multiple follicular papules with perifollicular purpura at all extremities

Figure 4 Dermoscopic findings of characteristic corkscrew hairs and perifollicular purpura

An initial diagnosis was nutritional deficiency. Signs of bleeding tendency and corkscrew hairs led us to suspect scurvy as the most likely diagnosis. Moreover, history of prolonged enteral feeding without vitamin C supplement for a year supported the cause of vitamin C deficiency. We performed a panel of laboratory tests and the results showed low serum ascorbic level < 0.1 (2-14) mg/dL which confirmed the diagnosis of scurvy. The patient also had vitamin D deficiency but had normal level of folic acid and vitamin B. Although his platelet count and coagulogram were within normal range, the complete blood count shows hypochromic normocytic anemia (Hb 7.2 g/dl, Hct 22.6 %, MCV 80fl, RDW 15.4, WBC 7,200/mm^3, Platelet 214,000/mm^3 Reticulocyte count 3%, Ferritin =1,320 ng/ml, serum iron = 22 , TIBC =25)

Figure 5 Multiple ecchymosis of the knuckle areas and hemarthrosis of the right ankle

Case 2: A 58-year-old, bedridden, Thai male who had a history of hypoxic ischemic encephalopathy from post cardiac arrest, 8 months ago. He had been bedridden with tracheostomy and received the same recipe of blenderized diet via a nasogastric tube since

then. His current medication was Valproic acid, Insulin regular, atorvastatin, Omeprazole, Sennosides, Magnesium hydroxide, N-Acetylcysteine NAC, Calcium carbonate, Zinc sulfate and vitamin supplements (Vitamin B complex, Folic acid, Ergocalciferol). After eight months, the patient developed hemarthrosis of the right knee and both ankles, concurrently with irregular skin surface texture of the extremities.

The dermatologic examination revealed multiple follicular papules with keratotic plugs and perifollicular purpura with some corkscrew hairs on both arms and legs. In the oral mucosa, bleeding per gum with loss of the lower incisors was found. Apart from multiple joint swellings, there are multiple ecchymosis on the knuckle areas of both hands, right knee and both ankles (figure 5).

Scurvy was suspected because of the characteristic corkscrew hair and bleeding tendency. Vitamin C level was lower than the normal range 0.23 (2-14) mg/dL without other abnormalities of coagulogram tests or platelet counts.

We treated both patients with oral vitamin C 1 gm. per day. The bleeding improved within three days and complete resolution of the skin lesions and bleeding diathesis were obtained after one month of treatment. Then, vitamin C was reduced to 60 mg/day tablet as a daily recommended dose.

Discussion:

Scurvy is a result of vitamin C (ascorbic acid) deficiency. Human body cannot synthesize vitamin C and the only way to obtain it is through diet. Fruits and vegetables are the major sources of vitamin C especially lemons, limes, oranges, grapefruits, strawberries, potatoes, tomatoes, broccoli, spinach, and peppers.[1] The cooking processes such as boiling and canning can decrease the vitamin C level down to 33%.[2]

Risk factors of vitamin C deficiency were identified in person with abnormal food intake including food faddism, alcoholism and poor nutrition due to any cause such as anorexia nervosa, old age, low socio-economic status, inflammatory bowel disease, celiac disease, gastric bypass surgery and severe food allergy. Smoking could increase catabolism of vitamin C due to oxidative stress and pregnancy also increased the requirement of vitamin C.[3,4]

Vitamin C has many important functions to human body for examples; absorption of iron, metabolism of folic acid, white blood cell function, synthesis of epinephrine and carnitine, synthesis of collagen and ground substances of the skin.[4,5,6] For these reasons the clinical presentations of scurvy can involve the skin, mucous membranes, blood and bones which appear as the cardinal signs of 4 Hs (Hemorrhage, Hyperkeratosis, Hypochondriasis

and Hematologic abnormalities).[7] The onset of symptoms usually occurs within a few months after vitamin C deprivation. Initially, the patient may develop non-specific symptoms e.g. malaise, lethargy, loss of appetite, weight loss, diarrhea, anemia, tachypnea, hypotension and fever. Later, as the deficiency is ongoing, the patient starts to develop dyspnea with bone and muscle pain.[5,7] Anemia is a frequent sign of scurvy secondary to blood loss and decreasing iron absorption of the small bowel.[3]

The skin manifestations include follicular hyperkeratosis, perifollicular purpura, and corkscrew hair, which is a pathognomonic sign of scurvy.[8] Cutaneous bleeding symptoms of the skin can present as many forms such as petechiae, bruises, subungual or submucosal ecchymosis.[5] Gingival hypertrophy and bleeding per gum may also be observed as well as loosening of teeth. Musculoskeletal manifestations are prominent in pediatric scurvy presenting with pain and pseudoparalysis from subperiosteal hemorrhage.[5] Neurological complication, such as seizures due to cerebral sheath hemorrhage, can be the cause of death in untreated patient.[5]

Diagnosis of scurvy is based on clinical presentation and history of impaired dietary ingestion. Plasma vitamin C level may not be accurate and can be normal because it represents a recent dietary intake rather than the real tissue level.[5,6]

The treatment requires vitamin C supplement at a dosage of 100-300 mg/day until symptoms resolve and continues a balanced diet dose of 40-60 mg daily.[5,7] The other nutritional deficiencies and co-morbidities should also be concerned.

Our case series represented classic symptoms of scurvy in the patients who had been bedridden for nearly a year and obtained the same recipe of blenderized diet. They presented with classic cutaneous manifestation of follicular hyperkeratosis, characteristic corkscrew hairs and bleedings at multiple mucocutaneous sites. Laboratory tests showed the low level of serum vitamin C which confirmed the diagnosis. Vitamin C supplement resolves all symptoms within 1 month.

Acknowledgement

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