



Vitamin-D deficiency and Osteomalacia in a veil wearer woman of Dhaka city

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Abstract

Osteomalacia may be defined as bone disorder characterized by defective mineralization, which leads to accumulation of unmineralized matrix or osteoid in the skeleton. It occurs from decreased presence of calcium or phosphate for incorporation into the hydroxyapatite of bone or due to deficient absorption or activation of vitamin D. It may result from reduced availability of vitamin D as a consequence of inadequate sunlight exposure, insufficient intake of vitamin, or malabsorption in patients with GIT disease. The insidious onset of bone pain with progressive nature and muscle weakness are characteristics features of osteomalacia. We experienced a case of osteomalacia presented with proximal muscle weakness with marked anterior chest pain in a veil wearer 38 year old woman caused by vitamin D deficiency due to malabsorption and lack of sunlight exposures.

Keywords: Osteomalacia, Hypovitaminosis-D, Rehabilitation.

Introduction

Osteomalacia may be defined as bone disorder characterized by defective mineralization, which leads to accumulation of unmineralized matrix or osteoid in the skeleton.¹ Among the osteometabolic disease it commonly occurs in elderly people and may be associated with osteoporosis.² It occurs from decreased presence of calcium or phosphate for incorporation into the hydroxyapatite of bone or due to deficient absorption or activation of vitamin D. It may result from reduced availability of vitamin D as a consequence of inadequate ultraviolet light exposure, insufficient intake of vitamin, or

malabsorption in patients with GIT disease.³ The use of veil is a variable that significantly influences the vitamin D status. Women wearing veil have higher risk of suffering vitamin D deficiency than women with no veil.⁴

Till today there is no gold standard of diagnosis of Osteomalacia. Distinguishing clinical presentations with marked biochemical abnormalities assist to reach the diagnosis. The insidious onset of bone pain with progressive nature and muscle weakness are characteristics features of osteomalacia.⁵ Well known radiological findings are looser's zone, pseudofracture and protrusio acetabuli,⁶ but often

subtle clinical signs . Therefore it often leads physicians to an incorrect diagnosis and considerable challenge to make a diagnosis in the early stage. Here, we report a case of osteomalacia with hypovitaminosis-D, secondary hyperparathyroidism and osteoporosis in middle aged women who is a veil wearer and known case of Irritable Bowel Syndrome (IBS), presented with bilateral anterior chest pain and multiple regional pain, walking difficulties, difficult to stand from sitting posture and weakness over 2 years.

Case Report

A 38-years-old, veil wearer, receptionist from lower middle class family lives in overcrowded old Dhaka city present with the complaints of multiple regional pain for 2 years, but last three months her pain becomes progressively severe and hampered her activity of daily living. In addition she faced mild weakness of shoulder girdle and pelvic-girdle muscles, resulting in waddling gait, difficulty in climbing stairs and difficulty to standing from sitting posture. She also noticed aching in the region of her anterior chest, which was aggravated during cough and movement, especially noticeable in bed at night during side to side movement. She has no co morbidity but for last 8 years she is diagnosed as a case of IBS. She is an orthodox Muslim woman who wears a black veil outdoors and is completely covered, with little exposure to the sun, even in her courtyard. She had no significant weight loss, oral ulcer, fever, skin rash or any sensory impairment. She had no family history of metabolic bone disease. She is independent with difficulty (modified independent). Physical examination revealed she is moderately anemic, BMI: 23.14kg/m² with waddling gait(Fig-01) , symmetrically mild muscle wasting over shoulder girdle .Grade-II tenderness over shoulder girdle muscle, upper arm, right hip, thigh and both feet. Grade-II tenderness on anterior chest wall both side. Breath sound was vesicular and painful in deep inspiration. All other system examination reveals no abnormality.

Her laboratory test results showed Hb%:9.8gm/dL (11-16g/dL), ESR:72 mm in 1st hour(upto 20mm), Vitamin-D:10ngm/ml(20-50ngm/mL), S.PTH:530.7pg/ml(10-65pg/mL), S.Calcium:2mmol/dL(2.0-2.6mmol/L), Serum phosphate: 2.5mg/dL(2.3-4.7mg/dL), S.ALP: 271U/L(46-116U/L), Urinary calcium:16.2mg/dL, S.creatinine:0.9mg/dl(0.5-1.2mg/dl), X-ray of pelvis: showed looser zone in right ileal part and left inferior part of head of femur(Fig:02), X-ray chest AP view showing mild cardiomegaly & Old fracture in multiple ribs (Right 5th, 6th, 7th, 8th, 10th and left 7th, 8th & 9th ribs) (Fig:03). Her BMD was T score: -3.2 at lumbar vertebrae, -2.9 at right femoral neck, - 2.4 at left femoral neck. Her endoscopy and colonoscopy report were normal. She was diagnosed as a case of IBS by gastroenterologist.

The lady was diagnosed as a case of hypovitaminosis-D, osteomalacia with osteoporosis and IBS. She was treated with multidisciplinary rehabilitation program including therapeutic exercise of core muscle strengthening exercise, quadriceps muscle strengthening exercise and breathing exercise. We also take some measure for fall prevention including removal of obstacles from walkway, well illumination at home, add side rail over stair and bathroom, use anti-slippery matt in bathroom. We advised her to intake enrich vitamin-D and calcium containing food and adequate sunlight exposure of exposed body part 20 minutes anytime from 11:00am to 3:00 pm 3-5 days/week. Her pharmacological management was injection vitamin D3 (2,00000IU) weekly I/M initially four week after then 40,000IU every week for another eight week and with oral calcium (500mg) twice daily. After 12 weeks of treatment with combined pharmacological and rehabilitation measure now she become well enough. Now her VAS score for pain: 1/10 which was on admission 7/10, Serum vitamin D: 75 nmol/mL, S.PTH: 86.8pg/ml, S.ALP: 117U/L Hb: 10.1gm/dl, Chest x-ray PA view also shows healing of pseudofracture (Fig:04).



Fig-1: Waddling gait

Base-15cm (Wide)

Stride length-60cm (reduced)

Toe angle: 15°(Increased)



Fig-2: Looser zone at Rt pubic rami and Lt neck of femur

Discussion

Osteomalacia is a bone disease of marked vitamin D depletion due to any cause with distinguishing radiological, biochemical and bone histological features.⁷ Osteomalacia originally presented to a generalized softening of bone caused by vitamin D deficiency and phosphate, calcium depletion.⁸ Rest of their life there is increasing risk of fractures if individual having osteomalacia due to prolonged severe vitamin D depletion.⁹ Clinically, patients with the disease present with vaguely localized pains on movement or weight bearing and proximal muscular weakness.¹⁰ Commonly the gait are affected due to muscle weakness, it is usually described as waddling gait. Hypocalcaemia, hypophosphataemia, and raised S.ALP activity are usually found together with

pseudofractures on radiology in osteomalacia.¹¹ The radiological evidence of a pseudofracture also known as looser zone as pathognomonic for osteomalacia, that's why it would be possible to diagnose without doing invasive histological investigation.¹²

Our patient have pseudofracture on right ischium and left neck of femur and old fracture in multiple ribs(right 5th, 6th, 7th, 8th, 10th and left 7th, 8th & 9th ribs). Osteomalacia in adults can present with fractures and low BMD, mimicking osteoporosis.¹³ An oncogenic osteomalacia is a rare paraneoplastic syndrome presented by bone pain, muscle weakness and fractures along with persistent hypophosphataemia due to renal phosphate loss, low active form of vitamin-D and normal FGF23.¹⁴ Now-a -days osteoporosis is relatively uncommon conditions in developed countries but they remain prevalent in elderly homebound people, few Muslim women who wear veil/hijab that covers a maximum area of skin and people with malabsorption. Our patient having two predisposing factors, one is she is a veil wearer (lack of sun exposure), another one is she had IBS (irritable bowel syndrome) for last 8 years relating to malabsorption, which may be the causation of osteomalacia in this case. Though we could not do bone biopsy (to find out thick osteoid seam), FGF 23(to exclude hereditary hypophosphataemic rickets), Sestamibi parathyroid scan (to exclude parathyroid adenoma), we found other biochemical and radiological evidence in favor of osteomalacia. The treatment of osteomalacia can expect of having good outcome by helping to remove and improve the cause, particularly osteomalacia can be corrected by regular sunlight exposure and vitamin D supplementation.¹⁵ Osteomalacia respond promptly to treatment with vitamin D. Our patient also has rapid clinical improvement after taking vitamin D. As our case was hypovitaminosis-D, osteomalacia that is not complicated with other disease like neurofibromatosis or other oncogenic condition, she responded well after vitamin D administration. Along with the drug treatment a weight-bearing

exercise regimen is also important for improving bone health and also muscle atrophy.¹⁶ Weight-bearing exercise may increase bone density and strength and reduce bone loss with advancing age. Some study suggests that even short term (9-12months) weight bearing exercise program may enhance vertebral bone density. In an attempt to prevent fractures, one must design measures that aim at the prevention of fall. Increasing home safety and improvements like provide optimal lighting, eliminate slippery floor surfaces and ensure adequate hand support in key home areas¹⁷. She also prescribed aerobic exercise. Osteoporosis also can present along with osteomalacia due to excessive bone resorption together with defective mineralization.^{18,19} Our patient have low BMD z score but we couldn't treat her with bisphosphonate because she had also renal compromise.

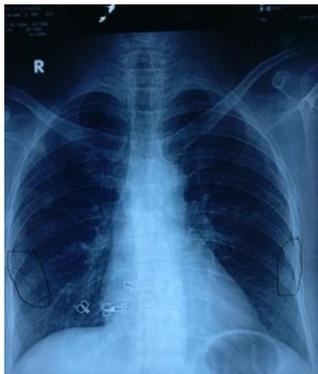


Figure 03: Multiple pseudofracture fracture at different ribs (Before treatment)



Figure 04: Multiple old healed fracture at different ribs (After treatment)

Conclusion

To sum up, vitamin D deficient cause osteomalacia with secondary hyperparathyroidism and osteoporosis should be considered in a patient

with low sunlight exposure and poor diet or malabsorption. Presenting this unusual case of osteomalacia we emphasize that such a varied clinical presentation needs further diagnostic work-up and appropriate management.

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