



ADOLESCENT OSTEOMALACIA, RARE PRESENTATION: A CASE REPORT

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<p>Article Info <i>Received 15/11/2015</i> <i>Revised 27/12/2015</i> <i>Accepted 2/02/2016</i></p> <p>Key words: Nutritional disabilities, Osteomalacia.</p>	<p>ABSTRACT Nutritional disabilities are of major concern in developing countries, especially in children and adolescents. Osteomalacia is characterised by poor mineralisation, which overlaps with osteoporosis, but differs in the fact that there is calcium or vitamin D deficiency. The adolescent age group is prone to nutritional rickets and/or osteomalacia due to increased demand for nutrients especially calcium and Vitamin D [1]. The adolescents present more as rickets and the presentation with pseudofractures is uncommon. One such case of an unmarried adolescent girl is being reported with the aim to emphasize that primary osteomalacia may present in adolescents with back pain, difficulty in squatting/walking and with pseudofractures in flat bones.</p>
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CASE REPORT

Patient, Ms X, a seventeen year old girl, unmarried, resident of Hardoi, visited Out Patient Unit (OPD) of Department of Orthopaedics, Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow in June 2014, with chief complaints of severe pain in low back and difficulty in standing and walking for past few months. The patient also complained severe pain while squatting. The patient had no history of even mild trauma. The patient belonged to low socio economic status, with poor housing facility, low dietary intake of milk and was a vegetarian. No other significant history like injury, diseases (seizure disorder, tuberculosis etc.), drug intake (antepileptic drugs, antitubercular drugs, cortisone etc.), alcohol intake was present.

On examination, the gait of the patient was waddling. She could not sit cross legged or even squat. Straight Leg Raising (SLR) was not possible on either side. Local tenderness was present in Scarpa's triangle bilaterally.

On laboratory examination, she had a low level of serum calcium (7.4mg/dl), low serum phosphorus (2mg/dl), elevated Alkaline Phosphatase (436 IU/l) and

Vitamin D deficiency (4.2ng/dl). Vitamin D Total test was analyzed on Siemen's ADVIA Centaur, standardized against ID-LC/MS/MS, as per Vitamin D standardization programme (VDSP).

The skiagram of pelvis with both hips-AP showed bilateral pseudofractures (Looser's zone) in superior and inferior pubic rami, incomplete fracture of right ilium (total five fractures) and generalised rarefaction in the bones (Fig 1a). The skiagram of dorsolumbar spine showed generalised rarefaction (Fig 1b). Diagnosis of osteomalacia was confirmed. The patient was advised complete bed rest, daily sunlight exposure of at least one hour in the morning (first sunlight), plenty of milk and milk products, Vitamin D and Calcium supplements and analgesics with muscle relaxants for one week for acute pain and spasm. After four weeks, pain was greatly reduced. Bed rest with mobilizing exercises (non weight bearing) were continued for twelve weeks, followed by gradual weight bearing exercises.

At twelve week follow up, normal serum levels of calcium (9.3mg/dl), phosphorus (3.9mg/dl) and Vitamin D (73.5ng/dl) were obtained but the level of Alkaline phosphatase (290 IU/l) was still elevated. The skiagram of



of pelvis with both hips-AP showed process of healing in the areas of multiple pseudofractures (Fig 2).

At 6 months follow up, her skiagram of of pelvis with both hips-AP showed complete healing of pseudofractures (Fig 3). Her serum calcium, phosphorus, Vitamin D and alkaline phosphatase were all within normal

range. The patient reported no symptoms of the illness and was able to move, walk, run, sit cross legged and even squat without any pain or restriction. She was able to carry out household chores and was contented. Her parents were satisfied with outcome of treatment.

Figure 1a. X-ray, pelvis showing decalcification of bone with pseudofractures of right iliac bone, superior and inferior rami pubic bone on both sides with sclerosis of both sacroiliac joints, obliterated left sacroiliac joint with bony fusion and diastasis of pubic symphysis.



Figure 1b. X-Ray Lumbosacral spine showing extreme osteoporosis with sclerosis of both sacroiliac joints and obliterated left iliac joint. Lumbar vertebrae, lumbar curvature and intervertebral spaces are otherwise normal.

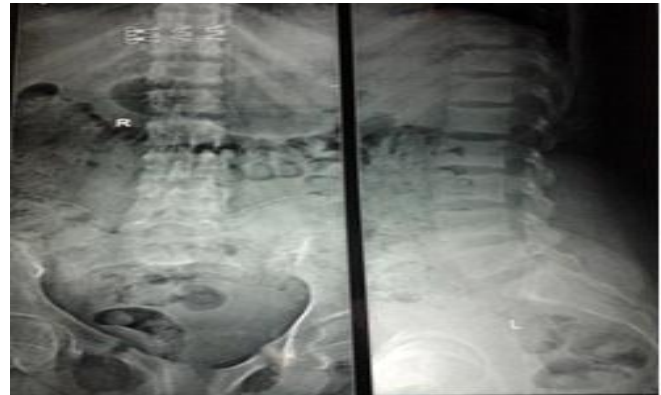


Figure 2. X-Ray pelvis, after three months follow up, showing united fracture in right iliac bone, superior ramus of left pubic bone and both inferior rami of pubic bone and progressively uniting fracture superior ramus of right pubic bone.



Figure 3. X-Ray pelvis, after six months follow up, showing old healed superior and inferior pubic rami fractures with bony ankylosed left sacroiliac joint.



DISCUSSION

Osteomalacia means softening of bones and is the adult counterpart of rickets [2]. Rickets is a disease process characterised by inadequate calcification of bone matrix (osteoid) in the immature skeleton while osteomalacia is the same process in adults [3]. The adolescents present with non specific symptoms and early recognition requires a high degree of suspicion in the absence of deformities. According to a study conducted in the Department of Physical Medicine and Rehabilitation, Paediatrics, K.G. Medical University, Lucknow and Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI), Lucknow on osteomalacia in adolescent girls in Northern India[1], the adolescent girls (compared to boys) are discouraged

from outdoor activities so that even non-purdah practising girls who would otherwise have their faces, neck, arms, forearms and hands exposed to sunlight suffer from severe Vitamin D deficiency rickets and /or osteomalacia. The authors had not encountered even a single male adolescent patient with osteomalacia. Further, it was also observed that low dietary calcium intake was also a pertinent factor in almost all the cases. Dietary calcium deficiency has been shown to cause secondary Vitamin D deficiency [4]. The same findings were reported in a study by Da X et al in adolescent girls in Beijing, China wherein low dietary intake of calcium in rural population kept their serum Vitamin D levels low despite more sun exposure as



compared to urban population. The low dietary calcium may cause clinically significant Hypovitaminosis D in these vulnerable population with marginal sun exposure [5]. In another study conducted by Balasubramaniam et al in 2003, at KGMU, Lucknow and SGPGI, Lucknow had reported that in clinically, biochemically and radiologically proved cases of rickets among children, the majority of children had normal 25-hydroxy vitamin D estimation. Children showed complete healing in three months whether they were given calcium alone or with Vitamin D3 and sunlight exposure, thus proving deficient calcium was universal in children and adolescents with rickets and osteomalacia[6].

CONCLUSION

The early diagnosis of osteomalacia requires a high index of suspicion. The early diagnosis is crucial in the sense that the patient may recover completely with

timely institution of therapy, even without Plaster of Paris (POP) immobilization and surgery. It is also important to overemphasize adequate sun exposure and dietary intake of calcium in the community in general and in females in particular.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

REFERENCES

1. Rajeshwari J, Balasubramaniam K, Bhatia V, Sharma VP, Agarwal AK. (2003). Aetiology and clinical profile of osteomalacia in adolescent girls in Northern India. *The National Medical Journal Of India*, 16(3), 139-142.
2. Maheshwari J. (1998). Essential Orthopaedics, 2nd Revised Ed, Page 263, Interprint, New Delhi-28.
3. Katherine K Brady and David E Brown. (2007). Metabolic and Endocrine disorders, Chapter in Orthopaedic secrets, authored by David E Brown and Randall D, Neumann, Edition 3rd, published by Elsevier, New Delhi.
4. Clements MR, Johnson L, Fraser DR. (1987). A new mechanism for induced Vit D deficiency in calcium deprivation. *Nature*, 325, 62-5.
5. Da X, Greenfield H, Fraser DR, Gek, trube A, Wang Y. (2001). Vitamin D & associated factors in adolescent girls in Beijing. *Am J Nutr*, 74, 494-500.
6. Balasubramaniam K, Rajeshwari J, Gulab, Govil YC, Agarwal AK, Kumar A. (2003). Varying role of Vitamin D deficiency in the etiology of rickets in young childrens vs adolescent in Northern India. *Journal of Tropical Paediatrics*, 49(4), 201-205.

