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Dr. R Hariharasudhan

MBBS, Junior Resident
(Academic), Department of
Orthopaedics, Mysore Medical
College and Research Institute,
Mysore, Karnataka, India

Dr. Sunil Kumar PC

MBBS, DNB, Professor,
Department of Orthopaedics,
Mysore Medical College and
Research Institute, Mysore,
Karnataka, India

Dr. Mohd Ejazul Haq Chand

MBBS, MS, Assistant
Professor, Department of
Orthopaedics, Mysore Medical
College & Research Institute,
Mysore, Karnataka, India

Vitamin D deficiency unmasked: A rare case of osteomalacia in pregnancy

R Hariharasudhan, Sunil Kumar PC and Mohd Ejazul Haq Chand

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Abstract

Background: Vitamin D deficiency is a significant public health concern in India, particularly during pregnancy, where it can lead to complications such as osteomalacia.

Case presentation: This case report highlights a rare instance of severe osteomalacia in a 21-year-old primigravida at 12 weeks of gestation, who presented with seizures, generalized body pain, spasms in her upper limbs, and proximal muscle weakness. Laboratory results revealed critically low vitamin D levels (3 ng/mL), elevated parathyroid hormone (PTH) levels, and hypocalcemia, confirming osteomalacia as the cause.

Results: She was treated with high-dose vitamin D and calcium supplementation, resulting in marked improvement within three days.

Conclusion: This case highlights the importance of recognizing and treating vitamin D deficiency in pregnant women in India, where it remains an underdiagnosed and underappreciated issue.

Keywords: Vitamin D deficiency, Osteomalacia in pregnancy, Hypocalcemia, proximal myopathy, Vitamin D supplementation

Introduction

Vitamin D deficiency is a prevalent health concern in India, affecting a large proportion of the population, including pregnant women. Studies suggest that over 60% of pregnant women in India are deficient in vitamin D, putting them at risk for maternal and fetal complications, which may often go underdiagnosed. During pregnancy, the demand for calcium and vitamin D increases to support fetal bone development. A deficiency in these nutrients can lead to osteomalacia, a condition characterized by inadequate mineralization of bone due to deficiencies in vitamin D, calcium, or phosphate. In pregnant women, osteomalacia may present as generalized body pain, muscle weakness, and difficulty walking, often mistaken for normal pregnancy-related discomforts. Given the high prevalence of vitamin D deficiency in India, early recognition and treatment of osteomalacia are essential to prevent maternal and fetal complications. This case report highlights a rare and severe instance of osteomalacia due to vitamin D deficiency in a pregnant woman in India^[1, 2].

Case Presentation

A 21-year-old primigravida at 12 weeks of gestation presented to the emergency department of our hospital with seizures, severe upper limb spasms, generalized body pain, and proximal muscle weakness. The patient had no significant medical or family history. On initial examination, she exhibited tetanic spasms in her upper limbs and generalized muscle tenderness, particularly over the proximal muscles of the upper and lower limbs. Neurological examination showed no sensory deficits, but there was significant weakness in the proximal muscles, consistent with proximal myopathy.

Arterial blood gas analysis revealed hypocalcemia (serum calcium 6.2 mg/dL), which was initially corrected with intravenous calcium gluconate. Despite calcium correction, her symptoms persisted, prompting further investigation. Obstetric evaluation, including an abdominal ultrasound, was unremarkable. MRI of the brain showed no abnormalities. MRI of the bilateral proximal thighs demonstrated muscle inflammation without signs of parasitic infections or other causes of myositis.

Laboratory tests showed a markedly elevated erythrocyte sedimentation rate (ESR) of 62 mm/hr, indicating an inflammatory process, and elevated alkaline phosphatase (ALP) levels of 519 U/L, suggesting increased bone turnover. Most significantly, the patient had severely low vitamin D3 levels (3 ng/mL; normal range: 40-60 ng/mL), elevated parathyroid

Corresponding Author:

Dr. R Hariharasudhan

MBBS, Junior Resident
(Academic), Department of
Orthopaedics, Mysore Medical
College and Research Institute,
Mysore, Karnataka, India

hormone (PTH) levels (176 pg/mL; normal range: 10-65 pg/mL), and low phosphate levels (2 mg/dL; normal range: 2.5-4.5 mg/dL), confirming the diagnosis of osteomalacia secondary to severe vitamin D deficiency^[3].

The patient was treated with high-dose vitamin D supplementation, receiving 600,000 IU of vitamin D intramuscularly once daily for five days. Within three days of starting treatment, she reported significant relief from pain and muscle weakness. By discharge, she was walking pain-free, with no further spasms or weakness.

Upon discharge, the patient was continued on weekly doses of 60,000 IU of vitamin D3 and daily oral calcium (1000 mg) and vitamin D (400 IU). Follow-up visits at 2-week intervals for 2 months and then monthly for an additional 2 months showed gradual normalization of vitamin D, calcium, ALP, and phosphate levels. At 4 months post-discharge, her symptoms had not recurred, and serum calcium, ALP, phosphate, and vitamin D3 levels had normalized. An ultrasound performed during the follow-ups showed no fetal skeletal anomalies, and the pregnancy progressed without complications.

Discussion

Vitamin D deficiency is widespread in India, particularly among pregnant women, due to factors such as inadequate diet, limited sun exposure, and high skin pigmentation, which impairs vitamin D synthesis. In urban areas, lifestyle factors such as staying indoors and cultural practices exacerbate the issue.² Osteomalacia, caused by insufficient mineralization of bone, is commonly seen in individuals with severe vitamin D deficiency. During pregnancy, it presents as body pain, muscle weakness, and difficulty walking, often misdiagnosed as pregnancy-related discomfort^[4].

This case highlights the importance of considering osteomalacia in pregnant women with musculoskeletal symptoms. Early recognition of the condition, as seen in this patient, allowed for prompt diagnosis and treatment with vitamin D and calcium supplementation, resulting in rapid improvement. Given the high prevalence of vitamin D deficiency in India, healthcare providers must remain vigilant and proactive in screening and managing this condition to prevent complications such as osteomalacia, rickets, and fetal bone malformations^[5].

Despite government initiatives promoting vitamin D supplementation, these programs remain inconsistent, particularly in rural areas. Timely intervention is critical to improving maternal and fetal health outcomes.

Conclusion

This case emphasizes the importance of recognizing and treating severe vitamin D deficiency in pregnant women in India. Given the high prevalence of vitamin D deficiency in this population, early diagnosis and appropriate supplementation are critical to prevent maternal and fetal complications. Healthcare providers should be proactive in screening for vitamin D deficiency and offering timely treatment to improve outcomes for both mother and child^[1, 3, 4].

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Conflict of Interest

The authors declared no potential conflicts of interest with regards to this article. Each author certifies that he or she has no commercial associations that might pose a conflict of interest in connection with the submitted article.

Ethical standards

Institutional ethics committee approved the study.

Informed consent was obtained from the participant included in the study.

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