



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 8, Issue, 7, pp. 18836-18838, July, 2017

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Case Report

SEVERE 25 HYDROXY VITAMIN D DEFICIENCIES IN SEVEN YEARS OLD CHILD

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DOI: <http://dx.doi.org/10.24327/ijrsr.2017.0807.0577>

ARTICLE INFO

Article History:

Received 05th April, 2017
Received in revised form 08th
May, 2017
Accepted 10th June, 2017
Published online 28st July, 2017

Key Words:

Serum 25 Hydroxy Vitamin D deficiency,
Mild deviation of lower limbs

ABSTRACT

A 7 years old female girl LKV was brought by her father to consult his family physician regarding his daughter leg problem. Slight bending of the lower limbs was observed from past 4 months, none of bone deformities. Her body weight is 24.3 kg and height 116.8 cm. After a complete physical examination, the physician was advised biochemical tests such as serum T3, T4 and TSH. TSH levels are within normal range, and serum 25 hydroxy Vitamin D levels found to be very low. X-ray report reveals that mild deformities are observed.

Background:

Literatures on the vitamin D status of the population in a tropical country like India have seldom been documented. Vitamin D deficiency is presumed to be rare. There is a need to assess dietary habits, serum calcium, 25(OH) vitamin D [25(OH) D], and parathyroid hormone levels of urban and rural population in a State in South India. Humans can fulfill their vitamin D requirements by either ingesting vitamin D or being exposed to the sun for enough time to produce adequate amounts. Vitamin D controls calcium absorption in the small intestine and works with the parathyroid hormone to mediate skeletal mineralization and maintain calcium homeostasis in the blood stream.

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INTRODUCTION

Case Presentation

A seven year old female child without any past medical history was brought to the clinic with the chief complaints of negligible bowing lower limbs, which was observed by her father since four months, and then he consulted his family physician. After a complete physical examination, the physician advised blood tests and radiographic X-ray for the lower limbs. Laboratory test reports reveal T3, T4 and TSH levels are existing within normal range and total Vitamin D 25 (Hydroxy) results are 5.36 ng/ml; Normal range (30-100ng/ml). Both tests are performed by using chemiluminescence immune assay (CLIA) method. Normal findings of X-ray report.

Treatment

After interpreting the subjective and objective findings, the physician ordered Calcimax P oral suspension once daily 10 ml (Manufactured by Mayer Vitabiotics), Calcijoint (Cholecalciferol granules) 1gram sachet (one gram and contains 60,000 international units of cholecalciferol). Once daily for two months and physician advised for the leg support 3 hours morning and 3 hours evening to avoid further bowing

of legs and also advised to expose the body to sunlight in the morning hours for at least 30 min.

Follow up: Second visit physician advice to continue the Calcimax P oral suspension once daily 10 ml and not advised to wear leg support. At the second visit lower limbs are normal and the physician was not advised any laboratory test and X-ray to a second visit.

Learning Objectives: This Case Study, the role of total 25 Hydroxy vitamin D (deficiency) results are 5.36 ng/ml does not show any significant clinical manifestations in this patient.

DISCUSSION

Vitamin D deficiency is becoming increasingly common in developing countries. Vitamin D deficiency causes the pediatric disease rickets. Data from other countries suggest that low vitamin D levels are a worldwide problem. A study from Andhra Pradesh in India revealed that 62-82% of children had 25(OH) D levels below 20 ng/ml [1]. A study of infants of Pakistani, Turkish and Somali immigrants to Norway revealed that 47% of infants had 25(OH)D levels below 10 ng/ml [2].

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In 93 children from northern Jordan (mean age 5 years), 39% of the children had 25(OH)D levels below 20 ng/ml^[3], it is also same in our case report.

Reports from other countries confirm low levels of 25(OH) D amongst children^[4-5]. Data on the vitamin D status of the population in a tropical country like India have seldom been documented. Vitamin D deficiency is presumed to be rare and causes the pediatric disease rickets.

Nutritional factors play a vital role in the bone homeostasis. Adequate calcium intake along with vitamin D helps to maintain bone mineral mass attained at the end of the growth period (peak bone mass). During infancy, childhood and adolescence, increasing dietary calcium intake favors bone mineral accrual^[6]. Adequate nutrition and sufficient activity provide mechanical impetus for bone development which may be critical in attaining bone growth potential. Vitamin D and calcium status correlate with increased bone mineral density and have the potential to increase the peak bone mass^[7].

Increasing bone mineral content during periods of rapid growth (childhood and adolescence) increases “peak bone mass” and may effectively prevent osteoporosis at a later age. Serum 25-hydroxyvitamin D [25(OH)D] is the most reliable indicator of vitamin D adequacy of an individual^[8], and, low peak bone mass in children^[9].

Vitamin D deficiency and/or poor dietary calcium intake can together lead to a defect in mineralization of bone (rickets in children; osteomalacia in adults). Rickets and osteomalacia are known to develop in immigrant Indians who migrate away from the equator^[10, 11]. Deficiency in vitamin D can cause fragile, thin, or deformed bones and rickets in children and osteomalacia in adults. Enough vitamin D in the diet, in addition to calcium, helps to prevent osteoporosis^[12].

This was attributed to the poor cutaneous synthesis of vitamin D due to pigmentation and inadequate sunlight exposure along with a low dietary calcium intake. 25(OH)D deficiency was presumed to be rare in tropical country like India with abundant sunshine^[13,14].

Acknowledgment

Author conveys sincere thanks to the patient and also to the physician who have co-operated with me throughout the work.

Abbreviations used

TSH: Thyroid Stimulating Hormone
T3: Triiodothyronine
T4: Thyroxine
25(OH)D: 25-hydroxyvitamin D
CLIA: Chemi Luminescence Immune Assay

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How to cite this article:

Ranakishor Pelluri *et al.* 2017, Severe 25 Hydroxy Vitamin D Deficiencies In Seven Years Old Child. *Int J Recent Sci Res.* 8(7), pp. 18836-18838. DOI: <http://dx.doi.org/10.24327/ijrsr.2017.0807.0577>
