

Vitamin-D Deficiency: A Neglected Topic Alarms the Health Care Providers

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ABSTRACT

Objective: To assess the vitamin D₃ in the study population and to compare it in the male female gender.

Methods: This observational study was conducted from November 2016 to April 2017. Total 200 patients were selected through inclusion and exclusion criteria. Student's t-test and SPSS version 20 to compare the mean levels of vitamin D₃ in male and female gender

Results: Male female ratio was found to be 1:1. Vitamin –D deficiency was found to be more prevalent in male gender as compared to females. Mean of the serum vitamin –D levels were 15.10±9.2ng/dl in men while it was 17.4±13.4 ng/dl in women. 139(69.5%) of the study population was found deficiency <20ng/ml while 31(15.5%) were having insufficient levels<30ng/ml and only 30(15%) showed normal levels 30-50ng/ml. There was a significant difference between the two genders with p value 0.000

Conclusion: Vitamin –D deficiency is very common in both genders of all age groups and males are more deficient as compared to female.

Key words: Vitamin-D, Osteoporosis, Arthritis, Rickets

INTRODUCTION

Vitamin-D is a sterol-containing vitamin derived from the cholesterol endogenously in the form of 7-Dehydrocholesterol that gets converted into cholecalciferol in the skin on exposure to sunlight. It is found in plants as well as animals, liver, fish, milk and eggs in the form of Ergocalciferol and cholecalciferol respectively both are preformed vitamin-D. Cholecalciferol is converted to 25-hydroxycalciferol and 1,25 dihydroxycalciferol in the liver and kidney respectively. Daily requirement of vitamin D for age group 1-70 years is 15ug/day and above that is 20ug/day. Its main function is to balance the plasma calcium levels through enhanced intestinal absorption, reducing the renal excretion and increasing the bone demineralization. Vitamin-D₃ is used to treat Rickets, Osteomalacia, Renal osteodystrophy and hypoparathyroidism [1]. Deficiency of this vitamin is

correlated to many other diseases in recent studies. The prevalence of deficiency of vitamin-D₃ is from 30%-90%. The deficiency is reported to be associated with asthma 92%in Pakistan, 85% in India, 80%in Iran. While 88.10% of the deficiency was reported to be associated with asthma [2]. Vitamin –D₃ levels of 20 to 29ng/ml and <20ng/ml are known as insufficiency and deficiency respectively [3]. Vitamin-D deficiency has almost been completed in children in developed countries through prophylactic supplementations but the under developed nations still suffer with this condition [4]. Vitamin D deficiency is reported to be a risk factor for the infectious diseases in children by many researchers [5]. This vitamin is suggested to be affecting the immune system through cathelicidin, a peptide having antimicrobial activity and through amplifying the activity of macrophages and B-cells [6]. Vitamin –D₃ deficiency is caused by either a reduced intake or reduced synthesis [7]. The history of vitamin D deficiency is very old as Daniel in 1645 and Trousseau in 1861 from England and France respectively declared rickets to be associated with reduced diet and exposure to sunlight [8]. There may be sex differences in prevalence of vitamin D₃ deficiency as pointed out by a Korean study [9]. Initially the deficiency is symptomless but if it persists longer the symptoms appear which may vary from patient to patient [10].

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There were few studies on this topic with certain gaps of knowledge so the current study was planned to estimate the prevalence of vitamin-D₃ deficiency in Hyderabad city and to compare the same in the two genders male and female. We hypothesized that vitamin-D₃ levels are deficient in both genders and there is a difference between the two genders.

METHODS

We selected the patients of both genders. Vitamin –D₃ was checked by machine Architec Abbot I 2000 for serum levels. Patients of joint pain were selected for this study involving all age groups. Patients on already on vitamin D₃ therapy or serum vitamin D3 levels >50 were excluded. Other diseases like kidney disease, malabsorption and liver disease associated with this deficiency were also excluded on history and available

investigations. International protocols were adopted in dealing with patients and blood samples.

Statistical Analysis

Obtained data figures of serum vitamin-D levels were processed through SPSS version 20 using t-test as statistical technique. Frequency, mean, standard deviation, minimum, maximum values and range were calculated collectively as well as individually in male and female groups.

RESULTS

Total 200 subjects were taken with 100 from male and female genders. Mean vitamin-D levels in the study population was found 16.25±11.9 with 2.6 the minimum and 49.3 the maximum.

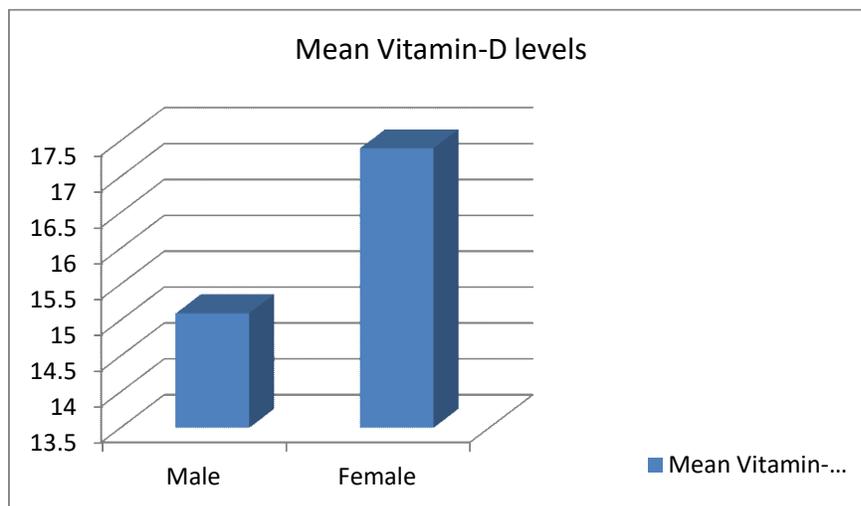
Table # 01: Mean and standard deviation of vitamin D levels in the study subjects

Parameter	Male	Female	P-Value
Vitamin-D Levels	15.10+9.2 ng/dl	17.4+13.4ng/dl	0.000
Minimum	2.8 ng/dl	2.6 ng/dl	
Maximum	44.6 ng/dl	49.3 ng/dl	

Over all calculations of the vitamin –D levels in the study participants.

Parameters	Values
Mean levels	16.25
Standard deviation	11.4
Minimum	2.6
Maximum	49.3
Range	46.7

Bar chart of mean serum vitamin D3 levels in male and female subjects



The mean in male and female was found 15.10 ±9.2 and 17.4±13.4 respectively. 139(69.5%) of the study population was found deficiency <20ng/ml while 31 (15.5%) were having insufficient levels<30ng/ml and only 30(15%) showed normal levels 30-50ng/ml. There was a significant difference between the two genders with p value 0.000

DISCUSSION

Most of the study subjects 139(69.5%) were found to be deficient so need correction with the parenteral injections that was consistent to 61% reported by Edmondo F et al 2012 . His study was based on chronic liver diseases patients [11]. Rahmoon AG et al 2015 also reported 57.14% of the vitamin D severe deficiency in alcoholics [12]. Ghazal A et al 2015 mentioned 83.9% of the children to be deficient in his study [13]. Only few (15.5%) from the 200 patients were found in this group to get advised to improve the diet rich in vitamin-D and sun exposure. Somewhat 10% of the population was having the vitamin-D levels >50ng/dl so were not included in the study as confounding variables. This seems a poor knowledge of dosage of this vitamin in the physicians or self-medication by the patients that needs itself motivations. The goal of the treatment in vitamin D deficiency is to raise the plasma levels at >30ng/ml that normalizes the calcium, reverses hyperparathyroidism as well as osteitis fibrosa partially. The deficiency or insufficiency of Vitamin D should be treated with higher doses of 4000 units/day or 50000 units/wk for several weeks [14]. Public awareness workshops should be conducted in schools and community. Doctors should focus on monitoring the status of vitamin D to avoid hypo and hyper conditions.

Diet needs corrections with vitamin D supplementations to save the future generations from diseases associated with the vitamin-D deficiency.

CONCLUSION:

The study population was found highly deficient in vitamin D and both genders are affected but males are more affected as compared to females and few were found with hyper vitamin- D level probably a result of aggressive management.

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