

Vitamin D Deficiency in Young Females with Musculoskeletal Complaints in Urmia, Northwest of Iran

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Abstract

Vitamin D (VIT D) deficiency is determined by serum 25-OH-D. Several studies revealed high prevalence of VIT D deficiency in females of the Asian sunny countries. 162 females referred to Urmia Orthopedic Clinics, with bone and muscle pain with the ages 15 up to 40 yrs participated in the study. The individuals were not pregnant, lactating, with no systemic or neurological diseases during the course of the study. From the serum level of 25-OH-D it was found that 57% were severely VIT D deficient (25-OH-D<10 ng/ml), 25% were mildly VIT D deficient (25-OH-D=10-20 ng/ml) and only 18% were normal (25-OH-D>20 ng/ml). The results of this study revealed that inadequate exposure to sunlight was the main cause of vitamin D deficiency.

Iran J Med Sci 2005; 30(2): 88-90.

Keywords • 25-OH-D • sun light • female • Iran

Introduction

Exposure of the skin to sunlight, ultraviolet radiation, transforms 7-dehydrocholesterol to vitamin D₃. In the liver vitamin D (VIT D) is metabolized to calcifediol or 25-OH-D (VIT D). This product is not biologically potent, but its circulating level provides a good index of the bioavailability of VIT D. The normal range of VIT D in human is more than 20 ng/ml. Values of 10-20 ng/ml indicate mild and less than 10 ng/ml indicate severe VIT D deficiencies.¹ VIT D deficiency causes dull musculoskeletal pain,² widespread or confined to a particular area most commonly lumbar spine.³ The mechanism of pain is pressure of demineralized collagen matrix deposited on endosteum and periosteum.⁴ VIT D deficiency leads to rickets in children, osteomalacia in adults and a special kind of hyperparathyroidism. Studies performed in some Asian sunny countries such as Saudi Arabia,⁵ Turkey,⁶ and Lebanon,⁷ revealed high prevalence of VIT D deficiency in females. Therefore, the present investigation was designed to assess the serum level of VIT D in women in Urmia, a city in North-West of Iran.

Patients and Methods

This study was performed, during January to March 2003, on 162 non-pregnant and non-lactating females aged from 15-40 yrs having bone and muscle pain for more than three months without manifestations of systemic or neurological diseases. Blood samples were collected and the sera were tested for VIT

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Table 1: Baseline data of female patients participated in the study.

Habitation	130 (Urban)	32 (rural)
Marital status	50 (single)	112 married
Gravidity 1 or ≥2	20 (1)	83 (≥2)
Lactation (1 or ≥2yr/s)	37 (1)	72 (≥2)

D with attention to questionnaires including age, occupation, habitation, gravidity and period of lactation.

Results

Baseline data regarding general information about 162 women classified according to habitation, marital status, gravidity and lactation are presented in Table 1. In respect to VIT D deficiency, 94 (57%) and 40 (25%) of them were regarded as severe (<10 ng/ml) and mild (10-20 ng/ml), respectively. However, only 28 women (18%) with VIT D more than 20 ng/ml were considered as normal. As shown in Table 2, the distribution of VIT D deficiency varied with respect to different age groups. In less than 20-year-old age group, severe and mild VIT D deficiencies were presented in 34 (70.2%) and 8 (17%) of females, respectively. The corresponding values for those in age groups between 21-30 yrs were 29 (67.4%) and 9 (20.9%). The respective number for those above 30 years were 31 (43.1%) and 23 (31.9%). Normal values of vitamin D for age groups <20, 21-30 and over 30 years were 5 (12.8%), 5(11.6%) and 18 (25%) respectively.

Table 2: Distribution of vitamin D (VD) levels (ng/ml) in various age groups.

VD level	(<10)	(10-20)	(>20)
Total No (%)	94 (57)	40 (25)	28 (18)
Age < 20 yrs (%)	34 (70)	8 (17)	5 (13)
Age 21-30 yrs (%)	29 (67)	9 (21)	5 (12)
Age > yrs (%)	31(43)	23 (32)	18 (25)

Discussion

In this study 82% of the females had VIT D deficiency in Urmia. Several studies have detected VIT D deficiency in the females of other Asian sunny countries. Fuleihan's investigation in Lebanon detected 60% severe and 35% mild vitamin D deficiencies in females.⁷ Sedrani revealed 44-100% VIT D deficiency in women of Saudi Arabia, where because of increasing temperature people avoid exposure to sunlight.^{5,8,9} Similar results were obtained from studies performed by Fonseca in Saudi Arabia.¹⁰ Alagol reported VIT D deficiency in Turkish women.⁶ There was relationship between kind of clothing, skin exposure and VIT D deficiency. In recent years there are also reports from India,¹¹ and China.¹² Finch and

Lowson showed osteomalacia in Asian immigrants in European countries.^{13,14} Vitamin D production in response to ultraviolet irradiation is similar in Asians and Europeans,¹⁵ which is probably due to an inadequate exposure to sunlight.

Conclusion

VIT D deficiency is mainly due to the lack of exposure to sunlight. The enrichment of milk with vitamin D and to encourage the consumption of dairy products is highly recommended.

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