

## Screening For Vitamin D Deficiency In Females In Madina Region; Saudi Arabia. Vitamin D Deficiency In A Sunny Environment

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### Abstract

**Background And Objective:** Poor sunlight exposure leads to vitamin D deficiency even in the sunniest places. So screening for vitamin D deficiency in outpatient clinics and inhospital setting in King Fahad Hospital , Al Madina Al Monwara.

**METHODS:** Screening for vitamin D deficiency by assessment of serum 25(OH)D with radioimmunoassay in 60 female patients aged 18 – 40 years. Serum calcium, phosphorous and alkaline phosphatase were assessed, too.

**Results:** 6 female patients (10%) showed significant vitamin D deficiency with 25(OH) D < 20 ng/ml. However 54 female patients (90%) showed severe vitamin D deficiency with 25 (OH) D < 10 ng/ml.

**Conclusion:** Vitamin D deficiency is very common in Saudia Arabia especially females due to poor sunlight exposure. So being underrecognized and undertreated, vitamin D deficiency represents an important health problem in MADINA REGION, KSA.

( Key words : Vitamin D , Sunlight exposure , Females )

### Introduction

Ultraviolet  $\beta$  radiation produces 90% of vitamin D in human beings and only very small proportions can be produced through diet [The Lancet (Editorial), 2010]. Poor sunlight exposure leads to vitamin D deficiency as in elderly housebound and Asian women who cover their bodies with clothes [Turner,2009]. Vitamin D insufficiency although widely prevalent is still under-recognized and undertreated [Thacher,2011]. The diagnosis of vitamin D deficiency is often missed as symptoms develop slowly and are nonspecific [Barclay,2009]. A cutoff value of 30 ng/ml is sometimes used for vitamin D status, at which

there is a plateau in suppression of PTH [Thacher,2011]. So concentrations of 25(OH) D over approximately 30 ng/ml are generally considered sufficient. Those between 8 and 30 ng/ml are insufficient with increased fracture risk and decreased calcium absorption. Concentrations less than 8 ng/ml may be associated with osteomalacia [Painter,2007]. More recently studies have reported inverse associations between levels of serum 25 (OH) D and the risk of wide range of diseases including cancer, vascular disease, infectious conditions, autoimmune diseases, osteoporosis,

type 2 diabetes mellitus, and obesity [Grey,2010].

### Patients And Methods

This study in KFH, Al Madina Al Monawara included 60 female patients aged 18 to 40 years, and a questionnaire was completed face-to-face. Blood samples were collected for serum 25 (OH) D, as the serum 25-hydroxyvitamin D [25(OH)D] concentration is a widely accepted indicator of vitamin D status so Serum 25(OH) D was assessed by radio-immunoassay. calcium, phosphorous, alkaline phosphatase, fasting blood glucose & thyroid function test. Those patients were selected from Endocrinology and General Medicine outpatient clinics and inpatient medical wards.

Exclusion criteria were:-patients with chronic kidney diseases ,patients on regular hemodialysis, those with osteoporosis on

treatment, hyperparathyroidism ,patients on vitamin D supplements& pregnant females .

### Results

This study showed that all patients had vitamin D deficiency [VDD] in either severe or significant forms, 6 female patients (10%) showed significant vitamin D deficiency with 25 (OH) D < 20 ng/ml. However, 54 patients (90%) showed severe vitamin D deficiency with 25 (OH) D < 10 ng/ml. Seven patients only showed hypocalcemia ranging from 1.26 – 2.05 mmol/L. All other patients showed normal serum calcium. Serum phosphorous was normal in all patients studied. Serum alkaline phosphatase was higher than normal range in 4 patients only.

**Table 1:- Associated Hypothyroidism & Type II DM with Vit D deficiency**

<i>Patient group</i>	<i>Associated Hypothyroidism</i>	<i>Associated type 2 DM</i>
Severe vitamin D deficiency	12	10
Vitamin D deficiency < 20 ng/ dl	6	No

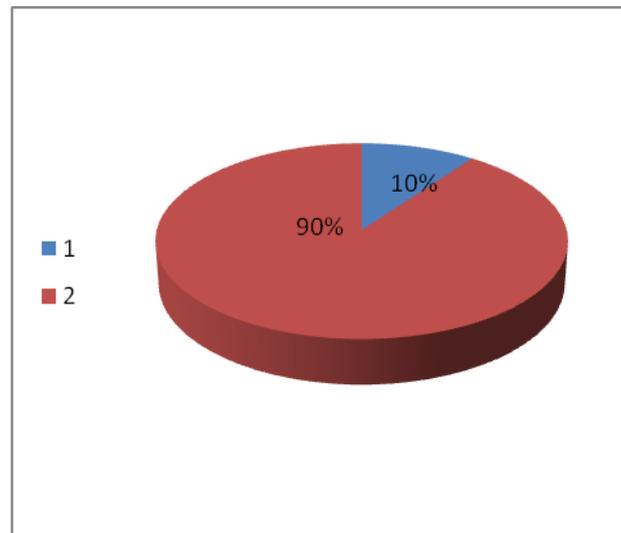
**Table 2:- Presence of symptoms of vitamin D deficiency**

<i>Patient group</i>	<i>Fatigue</i>	<i>Muscle pain &amp; bony aches</i>
Severe vitamin D deficiency	3 patients	2 patients
Vitamin D deficiency < 20 ng/ dl	No	No

**Table 3Relation between (serum Ca , Alkaline Phosphatase , and Phosphorus ) & ( Vit. D level )**

Vit. D level	Severe Deficiency Gp ( < 10 ng/dl)	Significant Deficiency Gp ( < 20 ng/dl)
<i>Ser. Ca</i>	Decreased	Normal
<i>Ser. P</i>	Normal	Normal
<i>Ser. Alk. Phosphatase</i>	Increased	Normal

**Fig. 1** Screening of vit. D deficiency in sunny environment



1 = 6 pts. (10 %) vit. D < 20 ng/dl  
2 = 54 pts. (90 %) vit. D < 10 ng/dl

## Discussion

The characteristics of 1,25 (OH)<sub>2</sub>D are those of a hormone and consequently vitamin D is a prohormone rather than a true vitamin [Thacher,2011]. Vitamin D increases gut absorption of calcium and phosphate, increases renal reabsorption of calcium and phosphate, decreases parathyroid production of PTH, and maintains a favorable calcium – phosphate product necessary for normal bone mineralization [Sanders,2005]. Potential non skeletal benefits of vitamin D include low cardiovascular mortality, reduced risk of diabetes mellitus, reduced risk of cancer and reduced risk of infection [Thacher,2011]. Significant vitamin D deficiency is defined as serum 25(OH)D < 50 nmol/L (< 20ng/ml). However if

25(OH)D is < 25 nmol/L (< 10 ng/ml) severe vitamin D deficiency is diagnosed [Fitzgerald,2008]. As long as sunlight exposure is adequate 1,25(OH)<sub>2</sub>D can be produced in the body without requirement for ingestion in the diet [Thacher,2011]. In the sunniest places such as Saudi Arabia and Australia 30% to 50% of adults and children have deficient or insufficient levels of vitamin D [ Holick, 2007].

Vitamin D deficiency among healthy young Saudi women of 25- 35 years was 30% [ Al-Turki,2008] . However another study showed that the prevalence of vitamin D deficiency in adolescent school girls in Jeddah, Saudi Arabia, was

81% with very low levels of vitamin D in approximately 40% [Siddiqui, 2007].

Our study showed that all female patients studied has vitamin D insufficiency below 30 ng /ml. Of those 10% have significant vitamin D deficiency < 20 ng/ml, and 90% have severe vitamin D deficiency < 10 ng/ml. Poor sunlight exposure is the likely cause of vitamin D deficiency in our study. Vitamin D deficiency which classically manifests in adults as osteomalacia is characterized by impaired bone mineralization [Thacher,2011]. Furthermore vitamin D deficiency is one of the secondary causes of osteoporosis [Painter,2007].

Serum 25(OH)D is the most stable and plentiful metabolite of vitamin D in human, which has half life of about 3weeks [Thacher,2011], and is the main storage form of vitamin D [Turner,2009] making it the most suitable indicator of vitamin D status [Thacher,2011].

To obtain adequate sunshine vitamin D, the face, arms, hands or back must have sun exposure without sunscreen for 15 min at least twice weekly. In sunlight deprived individuals (e.g. veiled women or confined patients), the recommended daily allowance of vitamin

D should be 1000 IU daily [Al-Turki,2008]. The previously mentioned measures could be the available weapons to fight an expected epidemic of vitamin D deficiency in kingdom of Saudi Arabia. In adults vitamin D supplementation reduces the risk of fractures and falls [Thacher,2011].

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## البحث عن نقص فيتامين د في الإناث في منطقة المدينة المنورة

المملكة العربية السعودية - نقص فيتامين د في بيئة مشمسة

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**الخلفية والأهداف :** إن قلة التعرض لأشعة الشمس تؤدي إلى نقص فيتامين د حتى في المناطق الغنية بأشعة الشمس - لذلك فقد تم تقصي لنقص فيتامين د في العيادات الخارجية وداخل مستشفى الملك فهد بالمدينة المنورة .

**المواد والطرق :** تقصي لنقص فيتامين د بتحديد مستوى 25 (هيدروكسي) فيتامين د في مصل الدم باستخدام معايرة المناعة الإشعاعية في 60 مريضة يتراوح سنهن من 18 - 40 سنة وتم معايرة الكالسيوم والفسفور والفوسفاتاز القلوي في مصل الدم .

**النتائج :** أظهرت 6 من المرضى الإناث (10%) نقص هام لفيتامين د بانخفاض 25 هيدروكسي د لأقل من 20 نانوجرام لكل ملي بينما أظهرت 54 من المرضى الإناث (90%) نقص شديد لفيتامين د (25 هيدروكسي د) لأقل من 10 نانوجرام لكل ملي .

**الاستنتاج :** إن نقص فيتامين د شائع جدًا في المملكة العربية السعودية خاصة الإناث نتيجة لقلة التعرض لأشعة الشمس لذلك ولكونه لا يتم التعرف عليه جيدًا ، ولا يتم علاجه جيدًا فإن نقص فيتامين د يمثل مشكلة صحية هامة في المملكة العربية السعودية.

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