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PREVALENCE OF VITAMIN D DEFICIENCY AMONG PATIENTS VISITING THORACIC SURGERY CLINIC IN TAIF SAUDI ARABIA

Sahar M. Khayat[1*]; Abdullah M. Khayat[2], Awwadh A. Althobaiti[3], Arwa K. Alharthi[4]; Razan A. Abdulsalam[5], and Mohammad E. M. Mahfouz[2]

[1]Prince Mansor Military Hospital, Taif, Saudi Arabia
[2]College of Medicine, Taif university, Taif, Saudi Arabia
[3]King Abdul-Aziz University Hospital, Jeddah, Saudi Arabia
[4]Al-Hada Military Hospital, Taif- Saudi Arabia
[5]King Fahad General Hospital – Jeddah

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Abstract:

Background: *Vitamin D deficiency (VDD) is becoming a major problem encountered in a clinical setting. It is a problem affecting many systems in the body. In this paper, we will assess the prevalence of VVD in thoracic surgery outpatient clinic in King Faisal Medical Complex in Taif, Saudi Arabia and their presentation.*

Methods: *A retrospective study was conducted at King Faisal Medical Complex, Taif, Saudi Arabia, from January 2016 to December 2016; included 120 patients with age range from 0 to 50 from both genders who visited outpatient thoracic surgery clinic and presented with common symptoms of vitamin D deficiency. Clinical and non-clinical data were gathered from medical records and documented laboratory workup. Statistical Analysis was done using the Statistical Package for the Social Sciences program version 21.*

Results*: Among the 120 patients 56.7% of the female group had low vitamin d level and it was more among the age group 19-49 years by 47.5%. The most common presenting symptoms in this study was 32% nonspecific musculoskeletal chest pain followed by chest deformity 20% then nonspecific musculoskeletal chest pain accompanied by deformity 7.5%.*

Conclusion: *High prevalence of vitamin D deficiency was discovered among the patients who visited the thoracic surgery clinic. It is most common among female and young patients with various presenting complain.*

KEYWORDS: *Blood, Epidemiology, History, Statistics and numerical data.*

Corresponding author:
Sahar Mohammed Noor Khayat,
Prince Mansor Military Hospital, Taif, Saudi Arabia
P.O. Box 700, Taif, Saudi Arabia
Tel: +966567066234
saharmnk@gmail.com

QR code

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INTRODUCTION:

Vitamin D levels below the normal range of 30ng/ml are considered insufficient for the human requirement. Low Vitamin D levels are associated with musculoskeletal symptoms but in some studies, it showed that it can also play a role in pulmonary symptoms. VDD has been associated with a decrease in lung function and increases in airway inflammation [1].

It has shown that many patients with severe chronic obstructive pulmonary diseases (COPD) have had a high prevalence of vitamin D deficiency, which revealed that many patients with COPD end up developing osteoporosis and osteopenia. These could relate to many reasons such as the use of corticosteroid therapy, physical inactivity, and less sun exposure and in the same time, it could serve as a risk factor for the disease [2]. In this group of patients, vitamin D supplementation with calcium was advisable. It could lead to increase their muscle strength and increase their bone density. In another hand, it has not shown to improve physical performance or reduce exacerbation. However, in one study of a randomized control trial, patients with very deficient vitamin D levels taking high doses of supplementation showed a reduction in exacerbation rate [3]. Studies have shown vitamin D levels below normal were also related to developing tuberculosis and could develop a more severe form of this infection due to VDD. Vitamin D has an important role as an antimicrobial; studies showed that vitamin D inhibits the growth of mycobacteria in vivo. That explained why vitamin D supplementation was considered for treatment and prevention of Mycobacterium Tuberculosis [4,5].

Vitamin D deficiency is a common problem in Saudi Arabia. It was recently estimated in a study that was done between 2011-2016 in Saudi Arabia among different populations that 81.0% has low levels of vitamin D. [6] and this issue has been reported since the 1980s. Many of these patients end up visiting the thoracic surgery clinic, presenting with major complaints such as nonspecific musculoskeletal chest pain or deformity or both. The primary goal of this study is to warrant the clinician to check the level of vitamin D initially before taking any kind of action unless it was urgent and then correct the deficiency. This may lead to a reduction in health care costs and a better outcome for the patients.

SUBJECTS AND METHODS:

Study sample and location

A retrospective study was conducted at King Faisal Medical Complex, Taif, Saudi Arabia, from January 2016 to December 2016; included a sample of total 120 patients visiting outpatient thoracic surgery clinic who presented with symptoms of vitamin D deficiency, participants ages were categorized into three groups ranging from 0-18, 19-49 to 50 and older, both male and female were included, with exclusion of patients who were diagnosed with rickets, osteoporosis, patients on vitamin D replacement therapy and patients without documented serum vitamin D levels.

Study protocol

All patients' medical records were reviewed to obtain clinical and non-clinical Information including age, sex, nationalities, main complaints and vitamin D levels. Vitamin D level was taken from the blood sample at King Faisal Medical Complex Laboratory. Vitamin D is measured according to Endocrine Society Clinical Practice Guidelines by Michael Holick and his college [7] by collecting serum 25-hydroxyvitamin D level, the vitamin D deficiency defined as serum level below 20ng/ml (50nmol/liter), and vitamin D insufficiency at 21-29 ng/ml (525-725nmol/liter).

Ethical approval

This study was approved by Ethical Committee in King Faisal Medical Complex, Taif; informed consent was taken directly from the patients to participate in this study.

Statistical analysis

Statistical analysis was done using SPSS software (SPSS Inc., Chicago, IL, USA). The frequency, percent, valid percent and cumulative percent were calculated.

RESULTS:

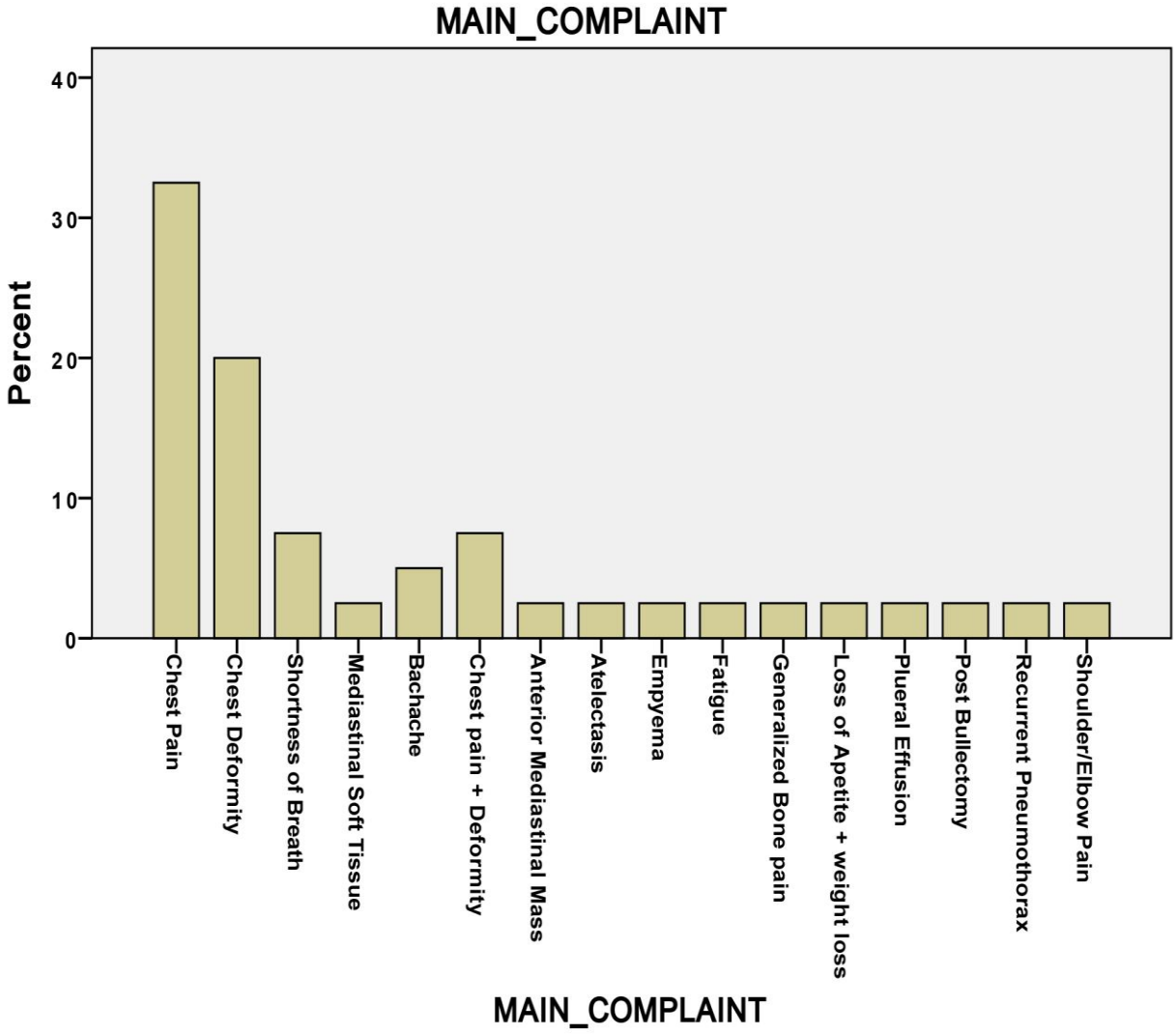
A total of 120 patients with vitamin D deficiency visiting the thoracic surgery outpatient department were found; the majority of the patients were typically Saudi nationality, with a mean age of 34.1+20.25 (Table 1).

Table 1: The demographic data and main complain of patient with vitamin d deficiency:

Demographic data (N=120)	
Mean age (yrs)	34.1±20.25
Female (%)	56.7%
Saudi Nationality (%)	95%
Vitamin D level	16.57 ± 7.20
Main Complaint	
Nonspecific musculoskeletal chest pain (%)	32%
Chest Deformity (%)	20%
Nonspecific musculoskeletal chest pain and Deformity (%)	7.5%
Shortness of Breath (%)	7.5%
Backache (%)	5%
Mediastinal Soft Tissue (%)	2.5%
Anterior Mediastinal Mass (%)	2.5%
Atelectasis (%)	2.5%
Empyema (%)	2.5%
Fatigue (%)	2.5%
Generalized Bone Pain (%)	2.5%
Pleural Effusion (%)	2.5%
Post Bullectomy (%)	2.5%
Recurrent Pneumothorax (%)	2.5%
Shoulder Pain/Elbow pain (%)	2.5%
Loss of appetite + weight loss (%)	2.5%

The mean of vitamin D level was 16.57 + 7.20 and 75.0% of the patients had vitamin D level below 20 ng/ml and vitamin D deficiency was more among the age group 19-49 years representing 47.5%.More than half of the participants were female 56.7%. The most common presenting symptom was nonspecific musculoskeletal chest pain 32% followed by chest deformity 20% then nonspecific musculoskeletal chest pain accompanied by deformity 7.5% (Fig 1).

Figure 1: Presenting symptom for patients with vitamin d deficiency:



DISCUSSION:

The Institute of Medicine recently reports evidence that a serum 25-OHD level above 50 nmol/L (20 ng/mL) is generally enough for healthy strong bones in 97.5% of the general population. Subsequently, vitamin D deficiency is considered if the 25-OHD level less than 50 nmol/L (20 ng/mL) [7-9]

In this study, we assessed the different levels of vitamin D depending on many variables. In this sample of 120 patients visited the thoracic surgery clinic of a King Faisal Medical complex between January 2016 and December 2016, 25-hydroxyvitamin D level levels were low in every subgroup, with the high prevalence of severe vitamin D deficiency. In our study, 75.0% of the patients had vitamin D level below20 ng/ml. The most common presenting symptoms in our study group was 32% nonspecific musculoskeletal chest pain followed by chest deformity 20% then nonspecific musculoskeletal chest pain accompanied by deformity 7.5%, while in a study done in Minnesota US, 93% of the tested group had low levels of 25(OH) D and they found that the main presenting complaint was persistent nonspecific musculoskeletal pain [10]. Another study conducted in Denmark among women with vitamin D deficiency and myopathy was the prominent symptom [11].

In our study we found that the mean of 25(OH)D levels is 16.57 + 7.20 and it appears to be a little low compared to a study in Korea where the mean level of 25(OH)D levels were 19.2 ng/mL for men and 15.1 ng/mL for women (P<0.001). [12] A recent study in UAE that has been conducted in Dubai Health Authority showed the middle-aged group of patients had the highest prevalence of vitamin D deficiency, where the younger patients (13-18 years) had 48.4% and 49.9% levels of vitamin D of < 10 and 10-30 ng/ ml, respectively [13].

Although compared to other studies in the developing countries like India, the biochemical analysis revealed a high prevalence of VDD as 70% was found the age group of 25-35 years. The cut off used to define VDD was taken 25 (OH) D levels as 20ng/ml [14]. While in Pakistan a study was done there and demonstrated high levels of VDD among all age groups, genders, income levels and locations in Pakistan. It showed that 53.5% had vitamin D deficiency, 31.2% had insufficient vitamin D, and only 15.3% normal vitamin D [15]. Our findings of low vitamin D level in are also consistent with a study done in Saudi Arabia: Riyadh region where adults'≥18 years were found to have vitamin D deficiency [16]. We concluded during our study that the reason for the deficiency could be related to poor sun exposure and poor oral intake of calcium and vitamin d supplements.

Limitations in our study include a small number size, most of the patients were with white skin tone, and thus darker skin-toned patients may have lower levels of vitamin D and might also be a limitation. Findings from this study may warrant health clinical providers to the deficiency of vitamin D in their patients and then correct the deficiency. This may lead to the reduction of health care costs and a better outcome for the patients. Awareness among patients is also necessary, by encouraging the medical student to implement awareness campaigns to the general population might raise their awareness and knowledge level of vitamin D. Particularly that vitamin deficiency can be prevented.

CONCLUSION:

High prevalence of vitamin D deficiency was estimated among the patients who visited the thoracic surgery clinic. Most of the patients were female with young age and various presenting complain of nonspecific musculoskeletal chest pain as the major presenting symptom. This encourages the physicians to check the serum vitamin d level for the patients before performing unnecessary imaging and invasive procedure to minimize the cost of care.

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