

# Subclinical Vitamin D Deficiency and Non-Specific Musculoskeletal Symptoms

## Subklinik D Vitamini Eksikliği ve Spesifik Olmayan Kas-İskelet Sistemi Semptomları

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### Öz

**Amaç:** Üçüncü basamak bir hastanede spesifik olmayan kas-iskelet sistemi semptomları olan hastalarda subklinik vitamin D eksikliği sıklığını belirlemektir.

**Hastalar ve Yöntem:** Kesitsel tipteki bu çalışma, 2018-2019 yılları arasında Quetta, Bolan Medical Complex Hastanesi Tıp Departmanında yapıldı. Yazılı onam alınarak, 20-45 yaş arası toplam 97 hasta çalışmaya alındı. Altı haftadan fazla süren yaygın vücut ağrıları öyküsü olan hastalar bu çalışmaya dahil edildi. Hastaların ayrıntılı öyküleri ve klinik muayeneleri yapılarak veriler kaydedildi. Radyoimmunoassay kiti ile D3 vitamini düzeylerini saptamak için her hastanın kan örneği alındı.

**Bulgular:** Hastaların ortalama yaşı 34.25 ± 10.64 idi. Ortalama semptom süresi 7.71 ± 0.82 hafta idi. Erkek / kadın oranı 4: 6 olarak bulundu. Spesifik olmayan kas iskelet sistemi bulguları olan hastaların 72 tanesinde (%74.20) vitamin D eksikliği tespit edildi.

**Sonuç:** Spesifik olmayan kas-iskelet sistemi semptomları olan hastalarda subklinik D vitamini eksikliği sıklığı anlamlı derecede yüksek bulundu.

**Anahtar Kelimeler:** Subklinik D vitamini eksikliği, spesifik olmayan kas-iskelet sistemi semptomları, D vitamini

### Abstract

**Aim:** To determine the frequency of subclinical vitamin D deficiency in patients with non specific musculoskeletal symptoms in a tertiary care hospital.

**Patients and Methods:** This cross-sectional study was performed in Department of Medicine, Bolan Medical Complex Hospital, Quetta between 2018 and 2019 years. A total of 97 patients between 20 and 45 years of age were included the study after written consent. The patients presenting with history of generalized body aches greater than six weeks were included in this study. The detail history was taken and clinical examination was done. Blood sample of each patient were collected to detect the vitamin D3 levels by radioimmunoassay kit.

**Results:** Mean age of the patients was 34.25±10.64 years. Mean duration of symptoms was 7.71±0.82 weeks. Male to female ratio was found to be 4:6. The frequency of vitamin D deficiency was detected in 72 of the patients with non-specific musculoskeletal symptoms (74.20%).

**Conclusion:** The frequency of subclinical vitamin D deficiency was significantly high in patients with non specific musculoskeletal symptoms

**Key words:** Subclinical vitamin D deficiency, non-specific musculoskeletal symptoms, vitamin D3

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## INTRODUCTION

Vitamin D insufficiency is a frequent complaints amongst the adult and children especially in developing countries (1). The deficiency of vitamin D can cause osteomalacia and rickets in adult and children respectively. The clinical manifestations of vitamin D deficiency may include nonspecific backache, joints pain, and generalized body ache presentation in the outpatient department (1-3).

Over the last 10 years, the vitamin D is important for stabilizing immune, reproductive, musculoskeletal, and integumentary system of the human body; have come to the front position (4,5). Badsha et al. (3) have suggested vitamin D deficiency as a possible cause of persistent musculoskeletal ache.

Vitamin D could participate a role in the prevention and treatment of a number of different clinicopathological conditions, and deficiency of it is associated with an increased prevalence of cancer, diabetes mellitus, cardiovascular disease; cognitive impairment and multiple sclerosis (6-9). Recently, Kaira et al. (10) found a high incidence of vitamin D deficiency.

A cross-sectional study from India report the prevalence of low vitamin D is 55%.10 in patients presenting with various musculoskeletal complaints. Vitamin D deficiency often presents with nonspecific musculoskeletal symptoms such as pain and weakness. It has been described in previous studies that patients with psychosomatic disorders often were found to have vitamin D deficiency (11).

It has been described by Bhatta et al. (11) that patients with psychosomatic symptoms often were found to have vitamin D deficiency. These symptoms are common presenting complaints in patients across medical specialties. This study has been planned with the objective to determine frequency of vitamin D deficiency in patients having nonspecific musculoskeletal symptoms.

## PATIENTS AND METHODS

This cross-sectional study was conducted at Department of Medicine, Bolan Medical Complex Hospital Quetta from 1st July 2018 to 30th June 2019. This population study was based on a total 97 patients between 20 and 45 years of age with subclinical vitamin D deficiency with non specific symptoms. Inclusion criteria included of Patients with history of generalized body aches greater than six weeks. Patients with the following co-morbid conditions determined on previous medical record like chronic kidney disease,

osteomalacia, malabsorption syndrome, end stage liver disease and patients on phenytoin or steroid therapy were excluded from the study as all these are effect modifiers, so can produce bias in the study. Complete history was taken for various nonspecific musculoskeletal symptoms such as generalized weakness, backache, body ache, painful aching legs and easy fatigability. A request was made for serum 25 hydroxyvitamin D determinations with radioimmunoassay kit in the institutional laboratory. A level of serum 25- hydroxyvitamin D <20 ng/dl was considered as deficient. During clinical examination of the patients, patients comfort was taken care of. The data was entered and analyzed through SPSS-20.

## RESULTS

There were 38 (39%) males and 59(61%) females patients and male to female ratio was 1:1.6. Forty six (47.40%) patients were  $\leq 35$  years while 51 (52.60%) patients >35 years with mean age was  $34.25 \pm 10.64$  years. There were 74 (76.30%) patients  $\leq 8$  weeks and 23 (23.70%) >8 weeks patients were presented with duration of symptoms and mean duration of symptoms was  $7.71 \pm 0.82$  weeks. The frequency vitamin D deficiency was detected in 72 (74.20%) of the patients with non-specific musculoskeletal symptoms (Table 1). When compared the effect of

**Table 1.** Demographic information of the patients

Variable	n	%
Gender		
Male	38	39.0
Female	59	61.0
Age (years)		
$\leq 35$	46	47.4
>35	51	52.6
Duration of symptoms (weeks)		
$\leq 8$	74	76.3
>8	23	23.7
Vitamin D deficiency		
Yes	72	74.2
No	25	25.8

**Table 2.** Comparison of Vitamin D deficiency according to age (n=97)

Age (years)	Vitamin D deficiency		P value
	Yes	No	
$\leq 35$	26 (26.8%)	20 (20.6%)	0.001
>35	46 (47.4%)	5 (5.2%)	

**Table 3.** Comparison of Vitamin D deficiency according to duration of symptoms (weeks)

Duration of symptoms	Vitamin D deficiency		P value
	Yes	No	
≤8	61 (62.8%)	13 (13.4%)	0.001
>8	11 (11.3%)	12 (12.3%)	

**Table 4.** Comparison of Vitamin D deficiency according to gender

Gender	Vitamin D deficiency		P value
	Yes	No	
Male	33 (34%)	11 (11.3%)	0.001
Female	39 (40.2%)	14 (14.5%)	

age, duration of symptoms and gender on vitamin D deficiency, significant ( $P < 0.001$ ) relationship was observed (Tables 2-4).

## DISCUSSION

It has been suggested that vitamin D deficiency may be causative etiology of persistent musculoskeletal ache (3). Recently, the authors retrospectively studied records of patients with musculoskeletal or rheumatic symptoms, without evidence of osteomalacia, found a high deficiency of vitamin D (10).

A cross sectional study was conducted at Karachi, revealed 80% of the patients having vitamin D (11). A retrospective study was done on asymptomatic patient reported 92% prevalence of low vitamin D level (12).

Vitamin D could contribute a role in the prevention and treatment of a number of different conditions, and deficiency of it is connected with an increased prevalence of cancer, diabetes mellitus, cardiovascular disease; cognitive impairment and multiple sclerosis (6-9).

Vitamin D deficiency is common in all age groups. It is assumed that 1/8 of the world population may have some vitamin D inadequacy, if the value  $\leq 30$  ng/mL is labeled as insufficiency of vitamin D level (13).

There are different assay techniques for estimation of vitamin D prevalence worldwide. Although there is no complete data on vitamin D insufficiency and risk factors such as breastfeeding without enough supplementation, darker skin or race, female gender, living in northern latitude, inadequate sun exposure, and winter season (14).

A high prevalence has been reported in children,

and teenagers from different countries such as UK (15), France (16), Greece (17), Lebanon (18), Turkey (19), and Canada (20).

In the present study frequency of vitamin D deficiency in patients with non-specific musculoskeletal symptoms was found to be 72 (74.20%) Prevalence rates of vitamin D deficiency among teenagers have ranged from 0 to 42%, and differences were noted depending on secondary to time of year, autonomy, and member race/ethnicity (21). There was significant effect was observed between age, duration of non-specific musculoskeletal symptoms and gender with vitamin D deficiency.

Haagensen et al. (22) reported that teenager girls with anorexia nervosa have low level of vitamin D to support the fat sequestration hypothesis. Low level of Vitamin D in adults is related with higher risk of diabetes mellitus type (23,24), impaired glucose tolerance (25), higher fasting plasma glucose levels (26), and insulin tolerance and dysfunction of B cells, even sometimes in good health individuals (27). Chiu et al. (27) reported that an increment of blood 25(OH) D from 10 to 30 ng/mL may pick up insulin sensitivity by 60%. Simultaneous vitamin D and calcium supplements reduce the risk of being type 2 diabetes mellitus patients (28-30).

There is lower risk of hypertension and myocardial infarction, and diabetic retinopathy in adult with higher level of 25(OH)D reported by Pittas et al. (30) Hypertensive individuals when being exposed with ultraviolet B radiation showed an increase in their 25(OH)D levels, and reduction in their blood pressure (31,32).

## CONCLUSION

The frequency of subclinical vitamin D deficiency was significantly high in patients with non specific musculoskeletal symptoms.

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