

Presentation of Subclinical Vitamin D Deficiency with Non-Specific Musculoskeletal Symptoms

KHALIL AHMED¹, AMIR HAMZA², AMIR BAKHSH³, MAQBOOL AHMED⁴, MUHAMMAD ZAHID MENGAL⁵, ABDUL BAQI DURRANI⁶

¹Senior Registrar, ²Assistant Professor,

³Medical Officer, Department of Gastroenterology

⁴Assistant Professor, Department of Pulmonology

⁵Microbiologist PRL, Fatima Jinnah General & Chest Hospital, Quetta

⁶Professor, Department of Medicine, Bolan Medical College/Bolan University of Medical and Health Sciences Quetta

Correspondence: Dr. Khalil Ahmed, Email: chagardii@yahoo.com

ABSTRACT

Objective: To evaluate the frequency of subclinical vitamin D deficiency in patients with non-specific musculoskeletal symptoms in outpatient department of Quetta city hospitals.

Study Design: Cross-sectional study

Place and Duration of Study: Department of Medicine, Bolan Medical Complex Hospital, Quetta from 1st July 2018 to 30th June 2019.

Methodology: A total of 97 patients between 20 and 45 years of age were recruited after written consent. The subjects presenting with history of generalized body aches greater than six weeks were included in this study. The history was taken in detail and clinical examination was done comprehensively. Blood sample of each patient were collected to detect the vitamin D3 levels by radioimmunoassay kit.

Results: The mean age of the particular 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 hydroxyl vitamin D deficiency in patients with non-specific musculoskeletal symptoms was found to be 72(74.20%).

Conclusion: The frequency of subclinical vitamin D deficiency and insufficiency were significantly high in patients with non specific musculoskeletal symptoms

Keywords: Subclinical vitamin D deficiency; Non-specific musculoskeletal symptoms; Vitamin D3.

INTRODUCTION

Vitamin D deficiency and insufficiency is very common throughout the world, especially in developing countries.¹ The severe Vitamin D deficiency can cause softening of bones and it is called osteomalacia in adults, while rickets in children. The other clinical presentations of vitamin D deficiency and insufficiency may include nonspecific bones, back, joints and generalized body pain, which were present mostly in the outpatient department.¹⁻³

During the last decade massive research has been done on 25-hydroxyvitamin D, which shows importance of this vitamin in maintaining the good health and the functions of the integumentary, reproductive, immune, skeletal and muscular system.^{4,5} According Badsha et al. vitamin D deficiency is associated with different clinic-pathological conditions.¹⁰

A cross-sectional study conducted in India reports, that the prevalence of hydroxyl vitamin D deficiency is 55% in patients presenting with various musculoskeletal complaints.¹⁰ 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 Bhatti et al. that patients with psychosomatic symptoms often were found to have vitamin D deficiency.¹¹ 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 suffering from various nonspecific musculoskeletal manifestations.¹¹

MATERIALS 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 subjects 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, bodyache, painful aching legs and easy fatigability. A request was made for serum 25 hydroxyvitamin D determinations with radiimmunoassay kit in the institutional laboratory. A level of serum 25- hydroxyl vitamin 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 whereas 59(61%) females with a male to female ratio of 1:1.6. Forty six (47.40%) patients were ≤35 years while 51 (52.60%) patients >35 years with mean age was 34.25±10.64 years. There were 74 (76.30%) patients ≤8 weeks and 23 (23.70%) >8 weeks patients were presented with duration of symptoms and mean

duration of symptoms was 7.71±0.82 weeks. The frequency of hydroxyl vitamin D deficiency in patients with non-specific musculoskeletal symptoms was found to be 72(74.20%).[Table 1]. When compared the effect of age, duration of symptoms and gender on vitamin D deficiency, significant (P<0.001) relationship was observed (Tables 2-4).

Table 1: Demographic information of the patients

Variable	No.	%
Gender		
Male	38	39.0
Female	59	61.0
Age (years)		
≤35	46	47.4
>35	51	52.6
Duration of symptoms (weeks)		
≤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	
≤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%)	

DISCUSSION

Several authors have suggested vitamin D deficiency as a possible cause of chronic musculoskeletal pain.³Recently, the authors retrospectively studied records of patients with musculoskeletal or rheumatic symptoms, without evidence of osteomalacia, and found a high incidence and prevalence of vitamin D deficiency.¹⁰

A cross sectional study was done at medical outpatient department of civil hospital Karachi, revealed 80% of the patients having low vitamin D level.¹¹A 92% prevalence of vitamin D deficiency is reported in retrospectively studied asymptomatic patients presenting to the endocrinology outpatient service in a tertiary care center in Karachi.¹²

The hydroxyl vitamin D could play an important role in the prevention and treatment of a number of different pathological conditions, and deficiency of it is associated with an increased prevalence of cancer, diabetes mellitus, cardiovascular disease; cognitive impairment and multiple sclerosis⁶⁻⁹

Vitamin D deficiency appears to be a prevalent world dilemma in all age groups. Estimates advocate that up to 1billion people may have vitamin D deficiency or insufficiency worldwide, if insufficiency is defined as vitamin D level≤30 ng/mL.¹³

The estimation of Vitamin D prevalence can be very difficult due to varying definitions of vitamin D deficiency and measuring procedures. There is insufficient data about vitamin D deficiency and predisposing factors such as winter season, lack of direct sun exposure, female gender, living at a northern latitude and breastfeeding without supplementation.¹⁴

A high prevalence of vitamin D deficiency and insufficiency has been reported in varying age group from different countries such as UK¹⁵, France¹⁶, Greece¹⁷, Lebanon¹⁸, Turkey¹⁹, 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%). In certain studies from various countries, among teenagers, prevalence rates of clinical vitamin D deficiency were ranged from 0 to 42%, which is relatively low as compared to our study. This dissimilarity noted may be due to autonomy, and member race/ethnicity.²¹There was significant effect was observed between age, duration of non-specific musculoskeletal symptoms and gender with vitamin D deficiency.

Haagensen et al²² reported that teenager girls with anorexia nervosa have low prevalence of vitamin D deficiency to support the fat sequestration hypothesis. Vitamin D deficiency in adults is associated with increased risk of non insulin dependent diabetes mellitus^{23,24}, impaired blood and serum glucose levels²⁵, higher fasting serum and plasma glucose levels²⁶, and structural abnormality in insulin, dysfunction of beta islets of Langerhans, even sometimes in healthy subjects.²⁷ According Chiu et al.²⁷ a normal vitamin D level, which ranges from 10 to 30 ng/mL can improve insulin sensitivity upto 60%.

A systematic review and meta-analysis among Caucasians shows that, Vitamin D insufficiency and deficiency with absence of calcium supplementation may present with nonspecific musculoskeletal disorders and increased blood glucose level, while Vitamin D with calcium supplementation improves the nonspecific musculoskeletal disorders and blood glucose level.²⁸According to Pittas AG. Concomitant administration of vitamin D and calcium supplements have shown lower risk of non-insulin dependent diabetes²⁹ and pre- diabetes.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 A study among Individuals suffering from hypertension and decrease levels of 25(OH)D after proper sun exposure shows increase in 25(OH)D levels and improvement in their hypertension.

CONCLUSION

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

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