Prevalence of Vitamin D level deficiency among patients with non-specific musculoskeletal pain at a tertiary care hospital in Khyber Pakhtunkhwa

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ABSTRACT

Objective: To objective of the study is to find out the prevalence of vitamin D deficiency in patients with non-specific musculoskeletal pain presenting to outpatients department at a tertiary care hospital of Khyber Pakhtunkhwa.

Methods: The design of our study was cross section and was conducted on 253 patients with age above 15 years presenting to Orthopedic Out Patients Department (OPD) of a tertiary care hospital from from 21st June 2018 to 20th June 2019.These patients presented with non-specific musculoskeletal pain like generalized body aches, bone pain, weakness and fatigue with no other complaints such as fever, visceral pain and any other trauma history. Their routine test like complete blood count(CBC), Renal Function Tests(RFT),Erythrocyte Sedimentation Rate (ESR) and random blood sugar (RBS) were normal. They were screened for Vitamin D level.

Results: out of 253 patients 37.94 %(n= 96) were male and 62.05% (n= 157) were female .Vitamin D deficiency was below normal in 75.49% (n= 191) patients comprising of 58.1% (n= 111) patients had deficiency and 41.8% (n= 80) had insufficiency while 24.5% (n= 62) showed sufficient level. In comparison to other age groups Vitamin D level was deficient and insufficient in 15 to 35 age group.

Conclusion: A high prevalence of vitamin D deficiency is present in our population. The Orthopaedic surgeon must keep his suspicion high for of vitamin D deficiency in patients of non specific musculoskeletal pain.

Keywords: Nonspecific musculoskeletal pain, prevalence, Vitamin D.

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INTRODUCTION

The deficiency of vitamin D is a worldwide problem and many studies showed that its deficiency is highly prevalent in Asian countries like Saudi Arabia, China, Iran and Indian subcontinent with 30 to 93 % of estimated prevalence and the probable aetiology is decrease intake, variable skin color and, life style in spite of enough sunlight availability.[1-3] Vitamin D regulates calcium in the body by synthesizing intracellular proteins.[4,5] Vitamin D is essential for proper functioning of central and peripheral nervous system. The vitamin passage through blood brain barrier may approved evidently by the discovery of its receptors in brain and spinal cord thus enhancing its role in the causation of musculoskeletal pain.[6,7] Patients with Vitamin D level of ≤ 20 ng/ml are labelled as deficient, 20-29 ng/ml insufficient and > 29 ng/ml are normal.[8]

Vitamin D defficiency in its chronicity may lead to osteomalacia and a compensatory secondary hyperparathyroidism (increase parathyroid hormone).[9] Osteomlacia is associated with musculoskeletal pain which is symmetrical in lower back and extremities, having with localized tenderness in some bones.[10] Vitamin D deficiency itself has been reported to cause muscle pain and bone pain.[11]

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The objective of our study was to find out vitamin D levels in patients presenting to our outpatient department so as to know prevalence of vitamin D deficiency and to treat them accordingly.

METHODS

This was a cross section study conducted on 253 patients presenting to Orthopedic Out Patient Department(OPD) of a tertiary care hospital from 21st June 2018 to 20th June 2019.Prior approval of the study was taken from hospital Ethical Review Board. Informed consent was taken from all the patients. from June to December 2017 .These patients presented with non-specific musculoskeletal pain like generalized body aches, bone pain, weakness and fatigue with no other complaints such as fever, visceral pain and any other trauma history. Their routine tests like CBC, RFT, ESR and RBS were done which were normal. They were screened for Vitamin D level as chemiluminescent immunoassay (CLIA) and analysed on LIAISON® XL. For standardization of values patients with Vitamin D level of ≤ 20 ng/ml are labelled as deficient, 20-29 ng/ml insufficient and > 29 ng/ml are normal.[8]

In this study we included all those patients whose age is above fifteen years, having no other disease or injury as a cause of pain and their base line investigations like ESR,FBC,RFTS and RBS were normal. We excluded those patients who have other causes of pain and neuropathy like osteoarthritis of ankle, knee and hip, Diabetes Mellitus, Rheumatoid Arthritis, Chronic renal disease, Hypoparathyroidism and Hyperparathyroidism.[12]

RESULTS

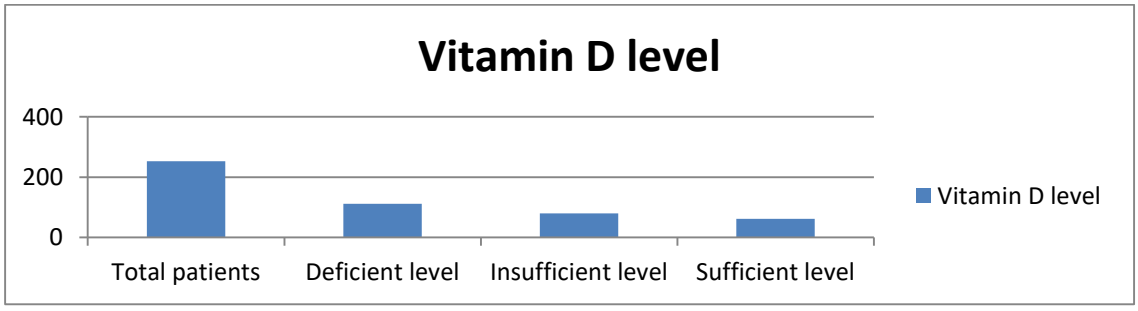
A total of 253 patients attended our outpatient department with complaints of non-specific musculoskeletal pain like bone pain, myalgia other than joints pain. In these patients 37.94 %(n= 96) were male and 62.05% (n= 157) were female. The age range of our patients were 15 to 60 years with mean age of 38.97±11.91. Vitamin D level deficiency is below normal in 75.49% (n= 191) patients comprising of 58.1% (n= 111) patients had deficiency and 41.8% (n= 80) had insufficiency while 24.5% (n= 62) showed sufficient level. Vitamin D level with gender distribution shown in table I. Age with gender distribution shown in table II. The overall Vitamin D levels of our study participants are shown in Graph I. In comparison to other age groups Vitamin D level is more deficient and insufficient in 15 to 35 age group.

Table I: Vitamin D levels with gender distribution

Vit.D level	Male	Female	Total
<20 ng/ml	48 (50%)	63 (40.12%)	111 (43.87%)
20-30 ng/ml	28 (29.16%)	52 (33.12%)	80 (31.6%)
>30 ng/ml	20 (20.83%)	42 (26.75%)	62 (24.5%)
Total	96 (37.94%)	157 (62.05%)	253 (100%)

Table II: Age with gender distribution

Age group	Male	Female	Total
15-35	24 (25%)	52 (33.12%)	76 (30.03%)
36-45	38 (39.58%)	73 (46.49%)	111 (43.87%)
46-60	34 (35.41%)	32 (20.38%)	66 (26.08%)
Total	96 (37.94%)	157 (62.05%)	253 (100%)



Graph I: Overall Vitamin D levels of our study participants

DISCUSSION

Various studies have confirmed that vitamin D regulates many intra cellular immunological, hormonal and neurological pain control mechanisms and its deficiency causes chronic pain and its complications.[15-17] An immune modulatory action has also shown by vitamin D. Its deficiency affects all age groups and might be the cause of chronic undiagnosed pain of the muscles and joints. Musculoskeletal pain due to vitamin D deficiency can easily be treated by dietary supplements and medications.[18,19]

The deficiency of vitamin D is very common in Pakistan due to many factors including low vitamin D diet, lifestyle as most of the body is covered with cloths and sun exposure is only limited to face and hands.

In our study Vitamin D level deficiency is below normal in 75.49% (n= 191) patients had comprising of 58.1% (n= 111) patients had deficiency and 41.8% (n= 80) had insufficiency. Abbasi[20] also showed that 95.4% of patients included in their study with musculoskeletal pain suffered from deficiency of vitamin D. Ghai et al[21] reported vitamin D deficiency in 66% of men and 73% in women. Kalra [22] reported severe vitamin-D deficiency (< 10 ng/mL) in 55.55% of patients with backache while 38.46% patients had a level of 10-30 ng/mL.

In our study we were not able to find the exact cause of Vitamin D deficiency in various age groups. Moreover specific clinical features of deficiency were not elaborated in our sample population. We recommend further well designed large scale studies to address these limitations.

CONCLUSION

A high prevalence of vitamin D deficiency is present in our population. The Orthopaedic surgeon must keep his suspicion high for of vitamin D deficiency in patients of non specific musculoskeletal pain.

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Authorship and contribution Declaration

Israr Ahmad, Conception and design of the study
Sajjad Ahmad, interpreted the data
Muhammad Arif Khan, Final approval of the version for publication
Asad Ullah Jan, Drafted the manuscript
Syed Hamad Ali Shah Banori, acquisition of data
Mohammad Ali Shah, Revised the manuscript critically for important intellectual content