 Cross-Sectional Study

Correlation between Vitamin D and Heel Pain in Healthy Adults During Covid-19 in South Gujarat: A Cross Sectional Study

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Abstract

Background: Vitamin D is been traditionally known as anti-ricketic factor or sunshine vitamin. Vitamin D is a fat-soluble vitamin and its synthesis in the body is dependent on multiple factors like latitude, atmospheric pollution, clothing, skin pigmentation duration and time of exposure to sunlight. Assessment of vitamin D status of an individual is best reflected by measurement of circulating vitamin D metabolites. 2 metabolites S, namely 25, hydroxyvitamin D 1,25 dihydroxy vitamin D. Exposure to sunlight is responsible for physiological production of vitamin D endogenously in the skin from 7 dehydrocholesterol present in the subcutaneous fat. Vitamin D deficiency prevails in epidemic proportion all over the India subcontinent with a prevalence of 70%-100% in the general population. Association of vitamin D deficiency with a variety of nonspecific bone pain particularly in women. Vitamin D deficiency was recently suggested to trigger chronic disease. Planter heel pain is a common musculoskeletal foot disorder that can have a negative impact on activities of daily living and it is of multifactorial etiology. Pathogenesis of planter heel pain is considered to be excessive cumulative strain at the enthesis of the plantar facia. Low vitamin D levels have been associated with an increased in inflammatory cytokines and a significantly increased risk of pneumonia viral upper respiratory tract infections. Experimental reports have shown vitamin D has a role in reducing the risk of COVID-19 including consideration of the fact that the outbreak occurred in winter and the fact the vitamin D deficiency contributes to acute respiratory distress syndrome and case-fatality rates increased with age and with chronic disease co-morbidity, both of which are associated with a lower 1,25(OH)2D co-contraction.

Aim of Study: Aim of the study is to find correlation between vitamin D and heel pain in healthy adults.

Objective: To determine if there is correlation between vitamin D and heel pain in healthy adults.

Materials and Methods: 108 patients were assessed using NPRS for heel pain and also assessed for Vitamin D using lap reports in south Gujarat. The method of the sampling was convenient. All the subjects were familiarized about the whole procedure.

Results: The result showed negative correlation (p=0.023) between vitamin D and heel pain in healthy adults. The subjects used in the study was male and female age of 15 to 60. Lab reports was used to check vitamin D and NPRS was used to assess the heel pain. The level of the significance is 0.023 (<0.05) for vitamin D and heel pain.

Conclusion: The result of the study showed negative correlation between heel pain and vitamin D in healthy adults. By increasing the sun exposure and intake of vitamin D medicine heel pain can be decreased in healthy adults. For clinical purpose, physical therapist can advise the patient who have heel pain to go for vitamin D testing.

Keywords: *Vitamin D, heel pain, COVID-19.*

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Introduction

Vitamin D was classified as a vitamin in the early 20th century and in the second half of the 20th

century as a pro-hormone ("conditional" vitamin) [1,2]. Vitamin D has been traditionally known as "anti-ricket factor or sunshine vitamin". It is a matchless nutrient because it can be synthesized endogenously (skin) and it functions as a hormone [3]. Assessment of vitamin D status of an individual is best reflected by measurement of circulating vitamin D metabolites. Only two metabolites, namely, 25-hydroxyvitamin D [25(OH) D] and 1,25-dihydroxyvitamin D [1,25(OH) 2D], have received the greatest attention in biochemical estimation of vitamin D. Of these, the need for measuring serum 1,25(OH)2D is limited.

On the other hand, serum 25(OH)D provides the single best assessment of vitamin D status [4]. Although vitamin D has been traditionally considered important for skeletal health, recent studies have reported that vitamin D also has beneficial effects on extra skeletal tissues [1]. Several studies have suggested possible links between vitamin D and cardiovascular disease risk [11,12], diabetes [13,14], hypertension [15], and dyslipidemia [16,17]. There is an association of vitamin D deficiency with a variety of nonspecific bone pain, particularly in women [26]. Vitamin D deficiency was recently suggested to trigger chronic disease [27]. Levels of vitamin D are most likely to influence the occurrence of knee osteoarthritis (OA), one the most common bone diseases [23].

Plantar heel pain is a common musculoskeletal foot disorder that can have a negative impact on activities of daily living and it is of multifactorial etiology. A variety of mechanical factors, which result in excessive load at the plantar fascia insertion, are thought to contribute to the onset of the condition. This review presents the evidence for associations between commonly assessed mechanical factors and plantar heel pain, which could guide management. Plantar heel pain is associated with a higher BMI in non-athletic groups, reduced dorsiflexion range of motion, as well as reduced strength in specific foot and ankle muscle groups [29].

Causes of heel pain potentially include:Achilles's tendon rupture, where the tendon is torn, Achille's tendinitis, Plantar fasciitis, Heel bursitis, stress fracture, Poor posture, bone cyst etc.

In Current study authors found that vitamin D deficiency (as suggested by serum 25 (OH) D concentration < 20ng/ml) is far more prevalent in patients with severe COVID–19 disease requiring ICU admission and thereby risks the chances of life [22]. Infections of the respiratory tract are more frequent in the winter months and especially in the northern latitudes than they are in summer. This obviously also applies to the COVID-19 infectious disease that briefly spread all over the world in the winter months and became a pandemic. A common feature of the winter months and the inhabitants of all countries north of the 42nd parallel is a hypo-avitaminosis D that frequently occurs during this period. In addition, during cold temperature the virus will be more easily transmitted [30]. However, it is reasonable to hypothesize that vitamin D supplementation may enhance host immune responses against COVID-19 and its aggressive effects on all organ systems. Serum vitamin D levels above 50 ng/ml (125 nmol/l) may have beneficial effects in reducing the incidence and severity of various viral diseases, including COVID-19[31].

Material and Methods

Pen, Paper, Vitamin D Reports, Data Collection Form, (NPRS) Numerical Pain Rating Scale, Weighing Scale, Measure Tape.

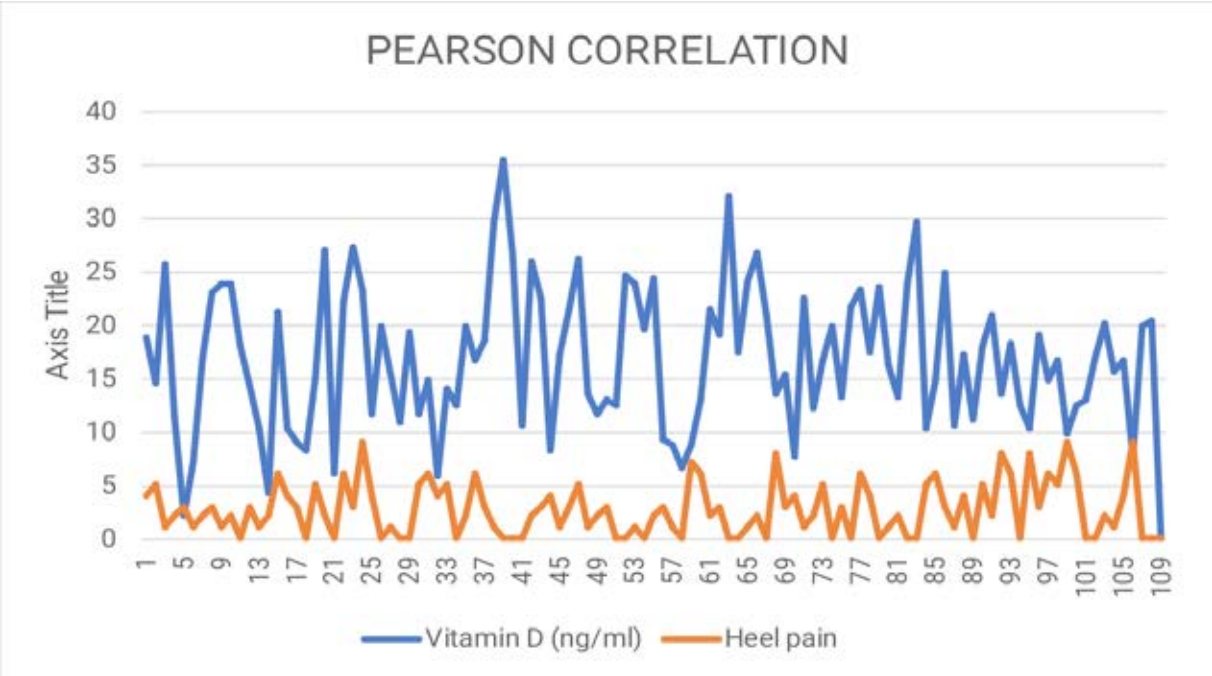
Procedure: The institutional ethical committee gave ethical clearance. The purpose of this study was explained and written consent was obtained from all the subjects. Subjects were preliminary screened based on the inclusion and exclusion criteria and their demographic data was collected like age, gender,

height, weight, BMI, occupation, sun exposure. After that checking of vitamin D reports of the patient was done. Then they were assessing for heel pain with the help of numerical pain rating scale.

Statistical Findings

Data analysis was done using SPSS version 16.In the present study 108 participants was included. (Male-38, Female-70). Participant were assessed for vitamin D and also assessed for heel pain by numerical pain rating scale.The Pearson coefficient of correlation was used to find correlation between vitamin D and heel pain.The baseline data was obtained from demographic data of vitamin D and heel pain.Statistically the correlation between vitamin D and heel pain is significant as p value is 0.023, which is less, then 0.05.

Negative correlation is seen as the value of r is (r = -0.219).Female are more prevalent in heel pain than male.



Discussion

The objective of this study was to find the correlation between vitamin D and heel pain in healthy adults.

In this cross-sectional study of 38 men and 70 women age of 15 to 60 years were participated. The total numbers of participants were 108 including male and female. The percentage of male population was 35% and that of female population was 53%. Then they were assessed for data such as vitamin D and heel pain. The NPRS was used to assess the heel pain.

In this study the mean±SD value of vitamin D was 16.8458±6.50945, the mean±SD value of heel pain was 2.6759±2.46405.It is found in our study that as the vitamin D increase the heel pain is decrease.There was a significant mild correlation was found between vitamin D and heel pain in our study.

Conclusion

This study concludes that decrease in level of vitamin D can lead to heel pain in healthy adults. By increasing the sun exposure and intake of vitamin D medicine heel pain can decreased in healthy adults. So,

this study provide the further insights into correlation between vitamin D and heel pain.

Conflict of Interest – None

Source of Funding- Self

Ethical Clearance –UkaTarsadia University

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