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Assessment of vitamin D levels in patients with musculo skeletal pain

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Abstract

Background: Musculo skeletal pain is most commonly observed in the clinical practice. Vitamin D deficiency is observed throughout the world. The assessment of vitamin D has to be performed in the serum accurately. The studies related to this topic are sparse.

Objectives: the current research was started to assess vitamin D levels in patients with musculo skeletal pain.

Methods: The present study involved 100 patients within the age group of 30 to 60 years of age. Both the genders (males =40), Females =60) were included in the study. Fasting blood samples were collected from the patients at 9 am in the morning to avoid diurnal variation and also for convenience of patients. Serum was separated and analyzed for vitamin D levels using HPLC method.

Results: Majority of patients belong to age group 30-40 years. Local pain is most common in the males. Head ache is most common pain in females. Majority of males have vitamin D levels < 50nmol/L. Majority of females have vitamin D levels < 50nmol/L.

Conclusion: The study results showed that in both males and females there is decrease in the vitamin D levels. Hence, the study supports the views of earlier studies to use the vitamin D in the management of musculo skeletal functions. However, the results of the study cannot be generalized as it is conducted at one center. So the study highlights the need of multiple center studies for better understanding of the relation between the variables and to plan better treatment strategies.

Keywords: Vitamin D, Fatigue, Pain, head ache

Introduction

Musculo skeletal pain is most commonly observed in the clinical practice. Vitamin D deficiency is observed throughout the world [1-3]. There are few studies that has assessed the relation between the vitamin D levels and musculoskeletal pain levels [4, 5]. The common source of vitamin D is through the exposure of skin to the sun rays and at the same time also from the food which is rich with vitamin D levels [6]. There are plenty of foods easily available that consist of rich amounts of vitamin D [7]. When the sun exposure has done to the skin, there will be conversion of pre vitamin D to vitamin D [8]. As the receptors for vitamin D are located in different body tissues, it can act on different areas [9]. It was reported that there exist the receptors for vitamin D in the musculo skeletal tissues [10]. This provides evidence that there is association between the vitamin D and musculo skeletal functions [11]. Further it was reported that the patients with musculo skeletal pain showed improvement after treatment with the vitamin D. Increases muscle strength and relieve in the pain was observed in the patients of musculoskeletal pain after administration of vitamin D. The assessment of vitamin D has to be performed in the serum accurately. The studies related to this topic are sparse. Hence, the current research was started to assess vitamin D levels in patients with musculo skeletal pain.

Materials and methods:

Study design: Observational study

Sampling method: Convenient sampling

Study population: The present study involved 100 patients within the age group of 30 to 60 years of age. Both the genders (males =40), Females =60) were included in the study. Thorough clinical evaluation was conducted to all the patients for musculo skeletal pain.

Voluntary informed consent was obtained from all the patients before the study. Willing participants, who are not having any severe complications, were included in the study. Unwilling patients with severe complications were excluded from the study.

Method of data collection: Data was collected using standard methods mentioned in the literature [14]. Fasting blood samples were collected from the patients at 9 am in the morning to avoid diurnal variation and also for convenience of patients. Serum was separated and analyzed for vitamin D levels using HPLC method.

Ethical consideration: The study proposal was approved by an institutional human ethical committee. Informed consent was obtained from all the participants. Confidentiality of data was maintained.

Data analysis: Data was analyzed using SPSS 20.0 version. Demographic data was presented as frequency and percentage. Student t-test was used to assess the significance of the difference between the groups.

Results: The results were presented in table no 1 to table no 4. Table 1 presents the Age wise distribution of cases. Table 2 presents the pain location wise distribution of cases - males. Table 3 presents the pain location wise distribution of cases - females. Table 4 presents the distribution of patients as per vitamin D levels - males. Table 5 presents the distribution of patients as per vitamin D levels - males. Majority of patients belong to age group 30-40 years. Local pain is most common in the males. Head ache is most common pain in females. Majority of males have vitamin D levels < 50nmol/L. Majority of females have vitamin D levels < 50nmol/L.

Table 1: Age wise distribution of cases

Age group in years	Number of patients (n=100)	percentage
30-40	40	40
41-50	30	30
51-60	30	30

Data was presented as frequency and percentage

Table 2: Pain location wise distribution of cases - males

Pain location	Number of patients (n=40)	percentage
Head ache	10	25
Local pain	19	47.5
Fatigue	9	22.5
General pain	2	5

Data was presented as frequency and percentage

Table 3: Pain location wise distribution of cases - females

Pain location	Number of patients (n=60)	percentage
Head ache	22	36.6
Local pain	18	30
Fatigue	10	16.6
General pain	10	16.6

Data was presented as frequency and percentage

Table 4: Distribution of patients as per vitamin D levels - males

Vitamin D levels	Number of patients (n=40)	percentage
≥50nmol/L	11	27.5
< 50nmol/L	14	35
< 30nmol/L	10	25
< 25nmol/L	5	12.5

Data was presented as frequency and percentage

Table 5: Distribution of patients as per vitamin D levels - females

Vitamin D levels	Number of patients (n=60)	percentage
≥50nmol/L	10	16.6
< 50nmol/L	30	50
< 30nmol/L	8	13.3
< 25nmol/L	12	20

Data was presented as frequency and percentage

Discussion: India is one of the countries where vitamin D levels are significantly lower in the population. Normal vitamin D levels are essential for daily functioning and to maintain homeostasis. Deviation of vitamin D levels not only disturbs the body metabolism but also the functions of musculo skeletal system. Using this concept, it was hypothesized that vitamin D administration may be used in the management of musculo skeletal dysfunctions. It was reported that there is inverse relation exist between the vitamin D levels and pain scores in patients [15]. Vitamin D has capability to release the interleukins and speed up the healing process and also relieves pain. It has anti-inflammatory actions [16]. However, the strong evidence to suggest use of vitamin D in the management of pain was sparse. A study reported that there was strong association exist between the pain and vitamin D levels only in females but not in males [17]. Interestingly, another study reported that men were more prone to develop deficiency of vitamin D and the relation was only observed in men. The current study results are in contrast to this study as we have observed a decrease in the vitamin levels both in males and females. No gender related association difference was observed in the present study.

The assessment of vitamin D has to be performed in the serum accurately. The studies related to this topic are sparse. Hence, the current research was started to assess vitamin D levels in patients with musculo skeletal pain. Majority of patients belong to age group 30-40 years. Local pain is most common in the males. Head ache is most common pain in females. Majority of males have vitamin D levels < 50nmol/L. Majority of females have vitamin D levels < 50nmol/L. The study adds to the existing knowledge that vitamin D can be used in the management of musculo skeletal pain. More studies are required to support this preliminary evidence.

Conclusion: The study results showed that in both males and females there is decrease in the vitamin D levels. Hence, the study supports the views of earlier studies to use the vitamin D in the management of musculo skeletal functions. However, the results of the study cannot be generalized as it is conducted at one center. So the study highlights the need of multiple center studies for better understanding of the relation between the variables and to plan better treatment strategies.

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Conflicts of interest: None-declared

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