Original Article

Prevalence of Vitamin-D Deficiency in Women of Reproductive Age

Zubia Bugti, Samia Saifullah and Nasreen Sultana

ABSTRACT

Objective: The aim of this study is to evaluate the prevalence of vitamin D in females of reproductive age.
Study Design: Observational / cross sectional study.
Place and Duration of Study: This study was conducted at the OPD of Sandeman Provincial Hospital (SPH), Quetta, Balochistan, Pakistan, in the time period between September 2021 to April 2022.
Materials and Methods: The study was conducted on a sample of 100 women, aged between 15 to 51. To evaluate the prevalence in the different stages of the reproductive age, the sample was distributed in three different groups. Group A included patients of age 15 to 25 (n=20). Group B included patients of age 25 to 40 (n=25). Group C included patients of age 40 to 51 (n=45). These patients arrived with complaints of lower backache and had not been subjected to vitamin D supplements prior to investigations.
Results: It was found that 77% of the patients either had a deficiency or insufficiency of vitamin D, whereby patients of Group C were found to be most prone to vitamin-D deficiency and lower backache.
Conclusion: The prevalence of vitamin-D deficiency is very high in women of reproductive age group. The patients of childbearing age came to the OPD with complaints of chronic backache and/or overall body aches. These patients had not been taking any sorts of supplements for Vitamin D prior to this investigation. These patients were subjected to vitamin d serum level test and it was found that 77% of the patients had severe to moderate Vitamin-D deficiency. vitamin-d deficiency is a prevailing issue all around the world and is causing various health related issues, further lowering the quality of life, as well as proving to be a hindrance in the socio-economic development of the developing countries where the vitamin-d deficiency level has been found to be the highest.
Key Words: Vitamin-D Deficiency, Women, Reproductive Age

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INTRODUCTION

Vitamin D is a prohormone vitamin required for the various significant functions of the human body; it also plays an essential role in the reproductive well-being of females. Human body itself is capable of synthesizing this vitamin when the skin is exposed to ultraviolet light varying between the wavelengths 290nm to 350nm [1].

Prevalence of Vitamin-D deficiency as well as lower backache has been found to be more common in females as compared to their male counterparts of the same age [2].

Vitamin-D deficiency may occur due to low life quality, low nutritional value intake of vitamin d, lack of exposure to direct UV light of the aforementioned wavelengths and long periods of time spent indoors [3].

Vitamin-Deficiency can lead to a number of health issues including inadequate bone development, poor mental growth, diabetes 1 and cancer [4]. It is therefore, very important for the body to obtain a sufficient amount of vitamin D in order to function and develop properly.

The Endocrine Society suggests that vitamin D serum levels equal to or below 50nmol/L are considered a deficiency; meanwhile a serum level between 50 to 75 nmol/L is considered an insufficiency [5].

The incidence of vitamin-D deficiency can be observed in pupils who do not get ample exposure to sunlight, which is one of the main sources of vitamin-D production in the human body. The diet, of course, plays an important role as well. It has been found that people who prefer a vegetarian diet often suffer from this deficiency since their intake of dairy products and other food sources of vitamin D is very low [6].

Vitamin-d deficiency poses a serious threat to the normal functioning of human body. Since vitamin d plays a significant role in the calcium-phosphorus homeostasis, women facing vitamin-d deficiency are prone to osteomalacia[7]. This is in direct relation with the prevalence of chronic lower back ache, which was a frequent complaint from the patients, and is caused

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when a person remains deficient for a long period of time [8].

MATERIALS AND METHODS

This study was conducted on a total of hundred patients, all within a reproductive age group i.e. 15 to 51. These patients came to the OPD of Sandeman Provincial Hospital, Quetta. The duration of the recordings in this study is from September 2021 to April 2022. The area of residence of these patients were somewhat spread through all of Balochistan. About 86% of these patients were from rural areas where lifestyle includes hard labor including labor related to agricultural. Lack of modernization in these areas also means that the simplest of household chores can put them under physical strain. None of these patients had been taking any form of vitamin d supplements prior to this investigation.

All patients who had been taking any form of supplement for vitamin-d deficiency were excluded from this study, hence the study targets only those patients who had been obtaining vitamin d through natural sources only.

Complete histories were taken from all these patients after whom they were examined physically. These patients came to hospital for consultations regarding various gynecological issues and complained about chronic backaches. Patients who come to consult for their gynecological issues had often been complaining about chronic backache, one of the most common complaints we have encountered from female patients over the years. Thereafter, tests for Vitamin D serum level were conducted on these patients and their results were then recorded and studied.

These records of their tests were divided into three groups according to a certain age group for further evaluation. These groups included:

The frequency, percentage and test results of vitamin d level were analyzed to determine the deficiency or insufficiency of vitamin d in these patients and to determine its relation to the lower backache patients had been complaining about.

RESULTS

The study was conducted on a total of 100 patients. 77% of these patients complained of lower backache and had vitamin-D deficiency.

Table No.1:Age group

Group	Number of patients	Age group
A	20	15-25
B	35	25-41
C	45	41-51

The maximum number of patients that came to the OPD with a complaint of chronic lower backache were in group C and upon obtaining the test results of their vitamin d serum level, it was found that prevalence of vitamin-d deficiency was also most common in this group.

Table No.2: Severe deficiency with serum level

Severe deficiency	serum level ≤10 ng/ml
Deficiency	10-20 ng/ml
Slight to moderate deficiency	20-30 ng/ml
Sufficient	≥30 ng/ml
Ideal	40-50 ng/ml
Indeterminate	50-150 ng/ml
Toxicity	>150 ng/ml

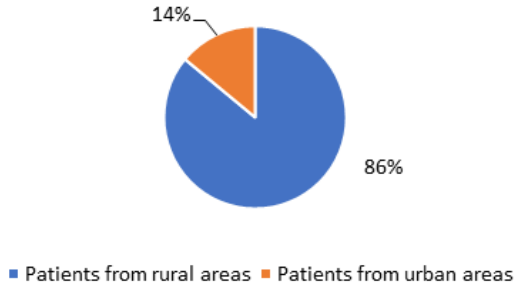

Figure No.1: Patient Distribution

DISCUSSION

The fat soluble vitamin D has the basic function of maintaining calcium homeostasis and plays a significant part in sustaining healthy bones [9]. The human body requires vitamin D for efficient absorption of calcium, which then strengthens the bones. In case of fractures, it becomes all the more significant since an adequate amount of vitamin d intake allows absorption of calcium, which in turn allows the bone to grow and heal. Vitamin-d deficiency results in the softening of bones in adults, which then increases the chances of fracture. Along with high chances of fracture, the weakening of bones causes pain and reduces the overall strength and therefore the quality of life of the person. Along with this, vitamin D also aids in strengthening the muscles and VITAMIN-D DEFICIENCY can cause the muscles to degenerate as well.

Not only does vitamin-d deficiency have adverse effects on the bones, it also has a massive impact on the immune system. Vitamin-d deficiency has been found to be correlated with life-threatening deceases such as breast cancer, colon and prostate cancer, as well as various heart deceases.

Vitamin D can be obtained from a number of food sources such as dairy products, fish, cod liver oil etc. The human body itself is capable of synthesizing vitamin D upon exposure to ultra violet light obtained from the sun. A limited or scarce intake of vitamin D food sources and lack of exposure to sunlight can cause vitamin-d deficiency [10].

Vitamin-D deficiency is common around the world as it is hard to obtain the adequate amount from food sources alone and a vast portion of the population

around the globe are not exposed to sufficient sunlight either. As a result, vitamin-d deficiency is very common; more so in developing countries [11]. It has also been found that vitamin-d deficiency's prevalence is rather high and common among patients with chronic backache, which implies that there is a connection between the two [12].

Patients that have vitamin-d deficiency often show common symptoms, these may vary from patient to patient but collectively, vitamin D deficient patients show these symptoms more often than not. The symptoms include muscular ache and aching bones, exhaustion, lower backache, depression and delayed recovery from sore muscles [10].

Lower backache is found to be strongly associated with vitamin-d deficiency [13]. Lower backache can be defined as an ache or stress in the muscles, or painfulness confined underneath the costal margin and over the inferior gluteal folds. This ache may or may not be with pain in the legs [14].

The concentration of vitamin d level in human body can be obtained by testing the level of 25 (OH) Vitamin D. Vitamin D serum levels can be distributed into seven categories. These can be listed as:

In our study, no patients were found to have either indeterminate or toxic level of 25 (OH) vitamin D. Nearly 45% of the patients in Group C were found to be severely deficient, while most members of group A were found to be within the values of ideal, sufficient or moderately deficient regions.

Patients of Group A were found to have the least amount of vitamin-d deficiency. The patients who reported that their exposure to sunlight was ample either had the ideal or sufficient level of vitamin d. Their diets consisted of dairy products which further reduced their chances of vitamin-d

Deficiency. However, it was found that these pupils complained of lower backache as well. This implies that vitamin-d deficiency is not the only factor causing lower backache. It was found that the prevalence of backache in patients of Group A was related to either menstrual backache along with leg pain, or was due to work load and poor quality of life. This finding is also supported by the study conducted in Turkey [15].

Patients of Group B included women who had had various deliveries and in some cases abortions as well. Majority of the patients in this group were found to have at least an insufficiency of vitamin D. Vitamin D level of patients who had recently given birth were often found to be low.

Pregnant patients in all groups often complained of lower backache, however it was not always due to vitamin-d deficiency. These patients complained of lower backache more frequently than those who were of the same age group but were not pregnant. This finding again, is in correspondence to the study conducted in Turkey [14]

Patients of Group C included women who had had the highest number of deliveries, and also included patients who have had multiple abortions. A number of these patients belonged to the rural areas of Balochistan, where quality of life is very low and despite the increasing age, women have to do heavy labor along with household chores. A combination of multiple pregnancies, low quality of life, inadequate exposure to the sun and low intake of foods rich in vitamin D, result in the high prevalence of vitamin-d deficiency in these patients.

Our study was found to show findings similar to those of Nupur Nandi and Banasree Bhadra, where it was observed that prevalence of lower backache is also associated with the number of deliveries and/or abortions [16]. Patients included in group C had had the highest number of pregnancies, indicating that the number of deliveries and in certain cases abortions was highest among these patients as well. As stated above, this group was also found to have the highest prevalence of vitamin-d deficiency. This observation reinforces the finding that the two are correlated.

Since vitamin D is also associated with muscular strength [17], not only did a number of patients complain about chronic backache but also complained about overall body aches. These patients also showed vitamin-d deficiency or insufficiency.

Not only in Pakistan, but it has been found in studies conducted in Iraq [1] and Iran [18], that prevalence of vitamin-d deficiency in females of reproductive age group is high. The studies conducted in Iraq and Iran also state that vitamin-d deficiency is common in UK and USA as well. People living the extreme north were also found to have high prevalence of vitamin-d deficiency, probably due to very limited exposure to the ultraviolet light. This indicates that vitamin-d deficiency is a prevailing issue not only in developing countries but all over the globe. However, its prevalence in developing countries is the highest since there are various factors including low quality of life, lack of nutritious food, hard labor etc. that increase the chances of Vitamin-D deficiency and resulting chronic backache.

CONCLUSION

Our study indicates the prevalence of vitamin-D deficiency is very high in women of reproductive age group. The patients of childbearing age came to the OPD with complaints of chronic backache and/or overall body aches. These patients had not been taking any sorts of supplements for Vitamin D prior to this investigation. These patients were subjected to vitamin d serum level test and it was found that 77% of the patients had severe to moderate Vitamin-D deficiency. vitamin-d deficiency is a prevailing issue all around the world and is causing various health related issues, further lowering the quality of life, as well as proving to

be a hindrance in the socio-economic development of the developing countries where the vitamin-d deficiency level has been found to be the highest.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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