

Vitamin D Deficiency A Cause of Low Backache In Young Patients. Myth or Fact??



Medical Science

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ii.Vitamin D deficiency
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ABSTRACT

Objective:

To determination cause – effect relationship between Vitamin D deficiency and Low Backache in patients less than

30 years of age.

Method: 52 consecutive patients with age less than and equal to 30 years attending the orthopaedic OPD for chronic low backache were chosen and 25 - hydroxy Vitamin D levels were done in all patients. Screening of Serum Vitamin D was also done in 45 age and sex matched resident medical doctors and paramedics who were apparently alright at the time of testing. All samples were collected after over night fasting and Serum Vitamin D was calculated using chemiluminescence assay from a reliable laboratory. Vitamin D deficiency was defined as serum level < 20 ng/ml, insufficiency as 20 – 30 ng/ml and 30 – 100 ng/ml as normal.

Result: The average Vitamin D level in the study group was 17.75 ng/ml and 13.59 ng/ml in the control group. 40 of 52 (76.92 %) patients in the study group had Vitamin D less than 20 ng/ml while 40 of 45 (88.89 %) candidates in the control group had Vitamin D less than 20 ng/ml. 7 of 52 (13.46 %) patients in the study group had Vitamin D of 20 – 30 ng/ml while 3 of 45 (6.67 %) candidates in the control group had Vitamin D of 20 – 30 ng/ml. Only 5 of 52 (9.61 %) patients in the study group had normal Vitamin D while 2 of 45 (4.44 %) candidates in the study group had normal Vitamin D levels.

Conclusion:

Vitamin D deficiency is highly prevalent in young patients with low backache but there seems to be no cause – effect relationship between Vitamin D deficiency and lowback ache. Thus Vitamin D deficiency is more of an associated factor in low backache and not the cause.

Introduction:

Degenerative disorders are most common in the cervical and lumbar spine⁽¹⁾. By far pain is the most common symptom. On an average neck pain and low back pain constitute almost 40 – 50 % of the patients in an orthopaedic OPD. Pain varies from dull aching occasional pain to severe pain disabling the patient from doing day to day activities. Low back pain is most prevalent between the ages of 35 and 55 years. A herniated nucleus pulposus is more likely to occur between the ages 30 and 40 years as at this time the disc loses its water content and the process of degeneration starts^(2,3). Low backache is no longer a problem of the elderly. Young patients often less than 30 years old are increasingly being bothered by backache.

Vitamin D deficiency is highly prevalent. The prevalence is higher in patients with backache. Even though the prevalence is high, the cause – effect relation between Vitamin D deficiency and backache is still controversial. Estimation of Vitamin D in serum remains the gold standard for diagnosis of Vitamin D deficiency. However, a cause-effect relationship between Vitamin D deficiency and low backache has not been established.

Materials and Methods:

1.) Patient Selection Criteria:

Patients with age less than or equal to 30 years with non traumatic low back ache who attended the orthopedic out patient department or took indoor treatment for the same were included. Patients with low backache secondary to trauma, inflammatory, infectious, metabolic disorders were excluded. Detailed history was taken and examination done. Patients diagnosed elsewhere as having degenerative disease of cervical and lumbar spine, who were referred to our center for opinion and management were also included in the study. The control group included age and sex matched resident medical doctors and paramedics who were apparently alright at the time of testing.

The study has been approved by the Ethics Committee and Insti-

tutional Review Board of our Institution.

2.) Hematological Investigation

After overnight fasting, single blood sample was withdrawn between 10:00 and 11:00 am in every patient. This was done to rule out any diurnal variations. Serum levels of 25-OH Cholecalciferol were done by chemiluminescence assay from a reliable laboratory.

3.) Analysis

SPSS Statistics (Version 20.0) was used for statistical analysis. Descriptive statistics were calculated for all variables with distributions assessed for normality. The Vitamin D levels were correlated to clinical parameters. For the purpose of statistical analysis, Vitamin D deficiency was classified as deficient (< 20 ng/ml), insufficient (20 – 30 ng/ml) and normal (> 30 ng/ml).

Results:

The study included 52 patients with a mean age of 24.74 ± 4.31 years (range 17 – 30 years). The control group included 45 age and sex matched candidates with a mean age of 23.45 ± 3.97 years (range 19 - 30). The demographic characteristics of the patient have been shown in Table 1.

Table 1: Demographic characteristics of the patients

Parameter	Division	Patients	Control
Age	15-20	7	5
	21-25	15	14
	26-30	30	26
Sex	Male	24	20
	Female	28	25
Religion	Hindu	31	27
	Muslim	21	15
Tobacco Usage	Smoker	10	8
	Non Smoker	42	37
Alcohol Consumption	Yes	12	10
	No	40	35

The overall average Vitamin D level in the study was 15.82 ng/ml. 80 out of the 97 were deficient in Vitamin D, 10 had insufficient Vitamin D and only 7 had normal Vitamin D. The average Vitamin D level in the study group was 17.75 ng/ml and 13.59 ng/ml in the control group. 40 of 52 (76.92 %) patients in the study group had Vitamin D less than 20 ng/ml while 40 of 45 (88.89 %) candidates in the control group had Vitamin D less than 20 ng/ml. 7 of 52 (13.46 %) patients in the study group had Vitamin D of 20 – 30 ng/ml while 3 of 45(6.67 %) candidates in the control group had Vitamin D of 20 – 30 ng/ml. Only 5 of 52 (9.61 %) patients in the study group had normal Vitamin D while 2 of 52 (4.44 %) candidates in the study group had normal Vitamin D levels.

Discussion:

In a recent study, the prevalence of Vitamin D deficiency in normal individuals was found to be 58.5 %⁽⁴⁾. However, the prevalence of Vitamin D deficiency even in normal individuals in India has been found to be reaching 90 %⁽⁵⁾. In our study, the overall prevalence of Vitamin D deficiency was 92.78 %.

The prevalence of Vitamin D deficiency in males (83.67 %) and females (89.56 %) showed no statistically significant difference. However the average value in females (14.89 ng/ml) was less as compared to males (19.82 ng/ml). This could be explained by the fact that most of the females were housewives and had to stay indoors. Sunlight is essential for the first step in Vitamin D metabolism that is conversion of 7-dehydrocholesterol to calcitriol. Thus, decreased exposure to sunlight may lead to deficiency of Vitamin D.

Prevalence of Vitamin D deficiency in Muslims was found to be 100 % as compared to 84% in Hindus. This might be due to the Muslim custom of wearing “burkha” preventing direct exposure to sunlight. This correlates with a recent study, which showed that women wearing concealed clothing were at higher risk of Vitamin D deficiency as compared to women wearing western outfits⁽⁶⁾.

There were a total of 44 males in our entire study. Out of these, 18 gave history of using tobacco in the form of smoking cigarette/ bidi or in the form of chewable items like guthka/ khaini etc. It was noted that all of these 18 males had Vitamin D levels less than 30 ng/dl. Also the average Vitamin D level amongst smoking males was 12.51 ng/dl as compared to 27.55 ng/dl in non smoking males. Thus smoking males had significantly low Vitamin D levels and higher prevalence of Vitamin D deficiency as compared to non smoking males. The above finding suggests that smoking might play a role in metabolism and deficiency of Vitamin D. Recent studies done in Germany and USA^(7,8) have studied the factors affecting Vitamin D levels, smoking being one of them.

The most significant finding in our study was that the average Vitamin D value in the study group was in fact more than the average Vitamin D value in the control group which consisted of apparently healthy individuals. The prevalence of sub-normal Vitamin D (less than 30 ng/ml) in the study group was 90.38 % (47 out of 52) as compared to 95.55 % (43 out of 45) in the control group. These findings suggest that Vitamin D deficiency is probably an associated factor in low backache and not the primary cause.

Conclusion:

Vitamin D deficiency is highly prevalent in young patients with low backache but there seems to be no cause – effect relationship between Vitamin D deficiency and low backache. Thus Vitamin D deficiency is more of an associated factor in low backache and not the cause.

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