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RESEARCH ARTICLE

PREVALENCE OF LOW VITAMIN D LEVELS IN NEWLY DIAGNOSED HIV PATIENTS

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ABSTRACT

Introduction: Vitamin D is essential for calcium homeostasis and bone metabolism. Vitamin D deficiency is associated with a number of comorbidities. There was disbelief that Vitamin D deficiency is uncommon in India. However from the data available in the published literature, Vitamin D deficiency is very common in India in all the age groups and both sexes across the country. Recently, low vitamin D levels have been associated with HIV disease progression and HIV related complications. Therefore, the role of vitamin D in preventing or mitigating these complications of HIV is of particular interest. We studied prevalence of low Vitamin D in newly diagnosed HIV positive patients and compared it with normal population in southern Rajasthan.

Methodology: It was a prospective case control study conducted from Jan 2016 to Dec 16. This study includes newly diagnosed HIV patients who were registered under ART centre at our institute were taken as cases and controls were normal individual without premorbidities.

Result: In case group 78% patient were vitamin D deficient, 12% were vitamin D insufficient and only 10% were vitamin D sufficient, whereas in control group 48% patient were vitamin D deficient, 18% were vitamin D insufficient and 34% were vitamin D sufficient. There is significant (p=.005) difference between prevalence of vitamin D deficiency in these two groups. There is weak but significant correlation (correlation coefficient=.336) between vitamin D and CD4 cell count. Increased CD4 cell count is seen in patient with sufficient vitamin D level.

Conclusion: The study has shown that, as compared to the general population, the HIV population seems to be more susceptible to Vitamin D deficiency and to its adverse effects, so all HIV positive patients should be prescribed Vitamin D supplements.

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INTRODUCTION

Vitamin D is essential for calcium homeostasis and bone metabolism (MF. Vitamin D deficiency, 2007). Sunlight is known to be the primary source of vitamin D and its production in the skin depends on exposure to sunshine, latitude, skin-covering clothes, the use of sunscreen lotions and skin pigmentation in healthy individual. Vitamin D is a fat soluble vitamin, also known as sunshine vitamin. Vitamin D deficiency is associated with a number of comorbidities, including hypertension, cardiovascular disease, insulin resistance, diabetes, dyslipidemia, impaired immune function, decreased neurocognitive function, and malignancies (Martins *et al*., 2007). There was disbelief that Vitamin D deficiency is uncommon in India (Hodgkin *et al*., 1973). However from the data available in the published literature, Vitamin D deficiency is very common in India in all the age groups and both sexes across the country (HarinarayanCv and Joshi Sr, 2009). The Human Immunodeficiency Virus (HIV) infects human T cells, causing a disease that progressively leads to a dramatic deterioration of the immune function. Since life expectancy of HIV-infected individuals has increased, mostly as a result of advances in diagnosis and treatment, they are more likely to develop long-term chronic complications, some of which have been associated with vitamin D deficiency. Abnormalities in vitamin D status and metabolism might be an important concern in HIV patients, especially in those receiving Highly Active Antiretroviral Therapy (HAART). Beyond that, there seems to be evidence that antiretroviral therapy may be responsible for worsening of hypovitaminosis D. (Mehta *et al*., 2010) Recently, low vitamin D levels have been associated with HIV disease progression and HIV related complications. Therefore, the role of vitamin D in preventing or mitigating these complications of HIV is of particular interest. Low vitamin D levels among HIV-infected persons have been described; however, these reports were either case series or studies from small cohorts of HIV-infected persons (Mueller *et al*., 2010). HIV infection and exposure to certain antiretrovirals might contribute to altered levels of 25(OH) D. (Van Den Bout-Van Den Beukel *et al*., 2008) It has been shown that hypovitaminosis D is more frequent among HIV-positive

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patients. Therefore a potential role of vitamin D in HIV-infected patients has been greatly investigated. Vitamin D supplementation has proved recently that it should be regarded as a way of slowing disease progression and preventing mortality in HIV-infected individuals. We compared the prevalence of vitamin D insufficiency or deficiency among HIV infected adults with that in adults in the general population of southern Rajasthan.

Aims and Objectives

a) To study the prevalence of low vitamin D levels in newly diagnosed HIV patient.
b) To study prevalence of low vitamin D level in general population.
c) To study correlation of low vitamin D level in newly diagnosed HIV patients with general population.
d) To study the relationship between vitamin D level and CD4 count in newly diagnosed HIV patients.

MATERIALS AND METHODS

The study was carry on HIV positive patients attending the outpatient at ART Center of RNT Medical College and Hospital, Udaipur for a period of 1 year i.e. from Jan.2016 to Dec. 2016 which was preapproved by the Ethical Committee of this institution review board. The informed consent will be obtained from the patients before enrolling them for the study.

Sample size

50 newly diagnosed HIV patients and 50 healthy controls

Inclusion criteria

1) Age> 18 years and less than 60 years old.
2) Newly diagnosed HIV positive patient.

Exclusion criteria

1) Chronic liver disease
2) Acute kidney injury /acute renal failure
3) Chronic kidney disease
4) Parathyroid disease
5) Chronic obstructive pulmonary disease
6) On calcium and Vitamin D supplementation
7) Patient who didn't give consent

Study design

It was a prospective case control study conducted from Jan 2016 to Dec 16. This study includes newly diagnosed HIV patients who were registered under ART centre at our institute were taken as cases and controls were normal individual without premorbidities. For diagnosis and confirmation of HIV infection we followed the National AIDS Control Organization (NACO) recommendations for HIV testing. Venous blood sampling from eligible candidates was taken and their vitamin D levels were analyzed with the help of radioimmunoassay. The study assessed CD4 count as the major biomarker reflecting the immune function in cases. CD4 count test reflects the actual number of CD4 cells per microliter of blood sample (number of cells/µL is equivalent to number of cells in mm3 of blood); the normal laboratory range for CD4 count is set between 500 and 1600 cells/microl. (http://www.aidsinfonet.org/uploaded/factsheets/13_eng_124.pdf) The CD4+ lymphocyte count was estimated by fluorescence activated cell sorter (FACS) count system (Becton Dickinson). One-way Analysis of Variance (ANOVA) was used to compare the mean valued of vitamin D of the HIV positive groups and control HIV negative subjects. T-Test was used for analysis on vitamin D levels that differed significantly among the groups. In this study, we adopted the Institute of Medicine and the Endocrine Society's guidelines' definitions of the different Vitamin D statuses, According to the levels of vitamin D, cases and controls were classified into three categories:

Vitamin D levels ≤ 20 ng/µL represented deficiency status;
Vitamin D level -21-29 ng/µL represented insufficiency status;
Vitamin D level ≥ 30 ng/µLrepresents sufficiency status (Holick and Chen, 2008).

RESULTS AND CONCLUSION

There was no statistically significant different in age, (p=0.297) sex, (p=0.418) occupation (p=0.220) and residence (p=0.312) among cases and controls.

Table 1. Comparison of vitamin D level

Vitamin D		Group		Total
		Case	Control	
<20ng	Number	39	24	63
	% within Group	78.0%	48.0%	63.0%
21-30ng	Number	6	9	15
	% within Group	12.0%	18.0%	15.0%
>30ng	Number	5	17	22
	% within Group	10.0%	34.0%	22.0%
Total	Number	50	50	100
	% within Group	100.0%	100.0%	100.0%

Table no 1 showing comparison of vitamin D between cases and controls. In case group 78% patient were vitamin D deficient, 12% were vitamin D insufficient and only 10% were vitamin D sufficient, whereas in control group 48% patient were vitamin D deficient, 18% were vitamin D insufficient and 34% were vitamin D sufficient. There is significant (p=.005) difference between prevalence of vitamin D deficiency in these two groups.

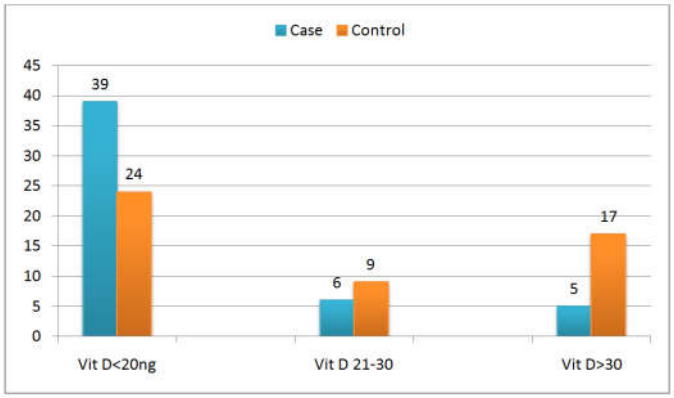

Figure 1. Comparison of vitamin D level

Table 2. Correlations

		Age	CD4	Vit D
CD4	Pearson Correlation	-0.032	1	0.366**
	N	50	50	50
Vit D	Pearson Correlation	0.067	0.366**	1
	N	50	50	50

Table 3. Distribution of cases according CD4 count

CD4 Count	No. of patients
<200mm/cuml	38 (76%)
200-499mm/cuml	10 (20%)
>/=500mm/cuml	2 (4%)

Table 4. Mean vitamin D and age

	Group	N	Mean	SD	Difference	SEd	t	df	P
Age	Case	50	34.44	9.547	2.380	2.269	1.049	98	.297
	Control	50	36.82	12.896					
Vit D	Case	50	17.095	7.4525	7.4750	1.9638	3.806	98	.0001
	Control	50	24.570		11.7171				

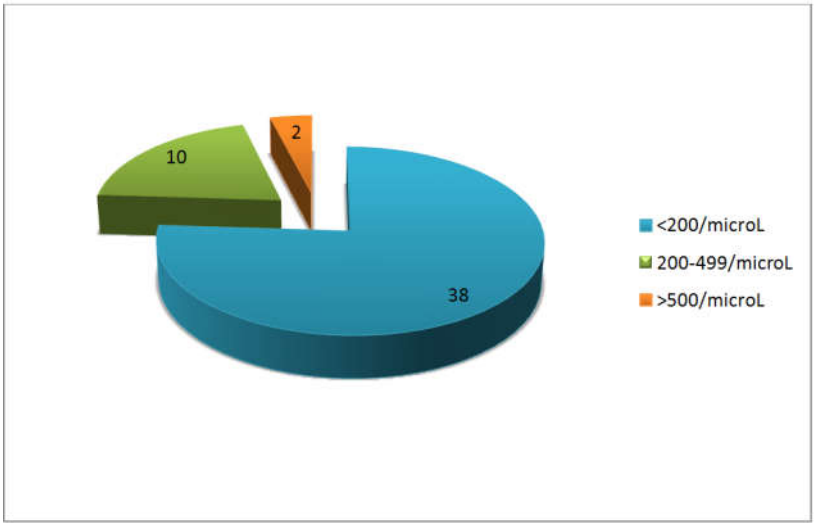

Figure 2. Distribution of cases according CD4 count

Table showing correlation between vitamin D and CD4 count and age. There is weak but significant correlation (correlation coefficient =0.336) between vitamin D and CD4 cell count.

CD4 count of 76% patient was below 200/microL, and 20% patient were with CD 4 count of 200-499 and only 4% patient was having CD 4 count of more than 500/microL.

Mean age for cases were 34.44 years and for controls were 36.82 years. This difference was statistically not significant (p=.297)
Mean vitamin D for cases were 17.095ng/ml and for controls were 24.570ng/ml. This difference was statistically significant (p=.0001).

Vitamin D deficiency remains a worldwide health problem that is often overlooked, and yet merits special acknowledgment in the health field because of its association with a variety of chronic diseases, including HIV. The literature has shown that, as compared to the general population, the HIV population seems to be more susceptible to Vitamin D deficiency and to its adverse effects. Results of the current study are largely consistent with those conducted in other countries when it comes to identifying a knowledge deficit. Certainly, there is a strong need for health promotion programming aimed at increasing vitamin D knowledge rates and providing key information that will help inform and encourage people to adopt health-related behaviours that will decrease rates of insufficiency, especially in at-risk groups.

REFERENCES

AIDS InfoNet. 2014, April 16. CD4 cell tests [Fact sheet number 124]. Retrieved from http://www.aidsinfonet.org/uploaded/factsheets/13_eng_124.pdf

Harinarayan Cv, Joshi Sr. 2009. Vitamin D status in India-Its implications and remedial measures. *J Assoc Physicians India*, 57:40-48.

Hodgkin P, Kay GH, Hine PM, *et al*. 1973. Vitamin D deficiency in Asians at home and in britain. *Lancet*, 167-171.

Holick, M. F. and Chen, T. C. 2008. Vitamin D deficiency: A worldwide problem with health consequences. *American Journal of Clinical Nutrition*, 87(suppl.), 1080S–1086S.

Martins D, Wolf M, Pan D, *et al*. 2007. Prevalence of cardiovascular risk factors and the serum levels of 25-hydroxyvitamin D in the United States. *Arch Intern Med*., 167:1159–65

Mehta S, Giovannucci E, Mugusi FM, Spiegelman D, Aboud S, *et al*. 2010. Vitamin D status of HIV-infected women and its association with HIV disease progression, anemia, and mortality. PLoS One 5: e8770.

MF. Vitamin D deficiency. *N Engl J Med*., 2007; 357:266–81

Mueller N, Fux C, Ledergerber B. *et al*. 2010. Highprevalence of severe vitamin D deficiency in combined antiretroviral therapy-naive and successfully treated Swiss HIV patients. *AIDS*, 24:1127–34.

Van Den Bout-Van Den Beukel CJP, Fievez L, Michels M, *et al*. 2008. Vitamin D deficiency among HIV Type 1-infected individuals in the Netherlands: effects of antiretroviral therapy. *AIDS Res Hum Retroviruses*, 24:1375–82.

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