

“Evaluation of Vitamin D levels in Patients with Coccidioidomycosis, a Case Control study”

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Abstract: 30674

Background: Inadequate serum Vitamin D 25OH total (VitD) concentrations have been associated with increase in incidence of tuberculosis and respiratory infections. To our knowledge there is no study available that correlates VitD levels in patients with Coccidioidomycosis.

Purpose: Comparison of vitamin D 25OH levels in patients with and without Coccidioidomycosis in a teaching county hospital population.

Method: Retrospective, matched case-control study in population ≥ 18 years old from 1990 to 2010 at Kern Medical Center with measured Vitamin D 25OH total levels in ng/ml. VitD deficiency defined as levels below 20 ng/ml and levels between 20 and 30 defined as VitD insufficient.

Total of 118 cases selected who had positive diagnosis of Coccidioidomycosis by serology, pathology, or cultures. Controls were selected from the general patient population without any history or evidence of Coccidioidomycosis infection. Cases and controls were randomly matched (ratio of 1 to 4) by age, race and sex and evaluated for demographics and co-morbidities. Analysis was performed by SAS JMP and Epi Info.

Results: Average VitD level in cases was 25.9 ng/ml and in controls was 22.6 ng/ml. There was no statistical difference between the prevalence of VitD insufficiency (20 to <30) between cases and controls. OR= 0.79 {CI95 (0.49-1.28)}, $P=0.3$. However, the prevalence of Vit D deficiency (<20) was statistically higher in controls OR= 0.42 {CI95 (0.34-0.71)}, $P=0.00008$. Oneway analysis indicated an overall strong correlation for Diabetes (DM) with $P<0.0001$ and Chronic Kidney Disease (CKD) with $P=0.0004$ for VitD insufficiency and deficiency. In order to study DM and CKD as possible confounding variables, their prevalence between the cases and controls were evaluated. We found that the prevalence of DM and CKD were in fact statistically higher in controls compare to cases respectively with OR=0.33{CI95(0.14-0.73)}, $P=0.002$ and OR=0.27{CI95(0.12-0.57)}, $P=0.0001$.

After exclusion of DM and CKD from cases and controls using Oneway analysis this time we found no statistical difference between cases and controls for prevalence of VitD deficiency and insufficiency. $P=0.15$.

Conclusion: There is no correlation between vitamin D deficiency and insufficiency and Coccidioidomycosis. This study also showed diabetes and chronic kidney disease as risk factors for low vitamin D levels.

Background

Inadequate serum Vitamin D 25OH (VitD) levels have been associated with increase in incidence of tuberculosis and respiratory infections. To our knowledge there is no study evaluated the correlation of VitD levels in patients with Coccidioidomycosis.

Purpose

Evaluation of vitamin D 25OH levels in patients with and without Coccidioidomycosis in a teaching county hospital population.

Methods

Retrospective, matched case-control study population ≥ 18 years, from 1990 to 2010 at Kern Medical Center.

VitD deficiency: Vitamin D OH total <20 ng/ml

VitD insufficiency: Vitamin D OH total ≥ 20 and <30 ng/ml

Total of 118 cases selected who had positive diagnosis of Coccidioidomycosis by serology, pathology, or cultures. Controls were selected from the general patient population without any history or evidence of Coccidioidomycosis infection. Cases and controls were randomly matched (ratio of 1 to 4) by age, race and sex and evaluated for demographics and co-morbidities. (Table:1) Analysis was performed by SAS JMP and Epi Info.

Demographics

	Cases (118)	Controls (472)
Age, Average years	42.8	44.5
18 to 39, % (n)	35.5% (42)	35.5% (168)
40 to 59, % (n)	55% (65)	55% (260)
≥ 60 , % (n)	9.3% (11)	9.3% (44)
Gender, % male (n)	63% (75)	63% (300)
Race: , % (n)		
Caucasian	14.4% (17)	14.4% (68)
Hispanic	68.6% (81)	68.6% (324)
African American	16.9% (20)	16.9% (80)
Comorbidities: % (n)		
Chronic Kidney Diseases	7%(9)	23%(111)
Diabetes	46% (37)	68% (322)
HIV+	0%(0)	<0.1% (2)
Gastric Bypass	0%(0)	<0.1% (4)
Malignancy	1%(2)	5% (25)
End Stage Liver Disease	1%(2)	1%(8)
Coccidioidomycosis infection % (n)		
Pulmonary	35.5% (42)	0%
Disseminated	64.5% (76)	0%
Any positive culture for <i>C. immitis</i>	31% (37)	0%
Positive complement fixation titers	97.4% (115)	0%

Table 1: Demographics

Results

Average VitD level in cases was 25.9 ng/ml and in controls was 22.6 ng/ml.

There was no statistical difference between the prevalence of VitD insufficiency (20 to <30) between cases and controls. OR= 0.79 {CI95 (0.49-1.28)}, $P=0.3$.

Prevalence of Vit D deficiency (<20) was statistically higher in controls OR= 0.42 {CI95 (0.34-0.71)}, $P=0.00008$.

Oneway analysis: Strong correlation for Diabetes (DM) with $P<0.0001$ and Chronic Kidney Disease (CKD) with $P=0.0004$ for VitD insufficiency and deficiency. (Figure 1, Figure 2)

Prevalence of DM and CKD were statistically higher in controls compare to cases respectively with OR=0.33{CI95(0.14-0.73)}, $P=0.002$ and OR=0.27{CI95(0.12-0.57)}, $P=0.0001$

Oneway analysis after exclusion of DM and CKD from cases and controls: No statistical difference between cases and controls for prevalence of VitD deficiency and insufficiency. $P=0.15$. (Table:2 and Figure: 3)

Results

	OR (95% CI)	P-value
Univariate Analysis:		
Vitamin D 25 OH insufficiency (≥ 20 to <30 ng/ml)	0.79 (0.49-1.28)	0.3
Vitamin D 25 OH deficiency (<20 ng/ml)	0.42 (0.34-0.71)	0.00008
Diabetes	0.33 (0.14-0.73)	0.0002
Chronic Kidney Disease	0.27 (0.12-0.57)	0.0001
Oneway Analysis:		
Vitamin D OH <30 ng/ml with Diabetes		<0.0001
Vitamin D OH <30 ng/ml with Chronic Kidney Disease		0.0004
Vitamin D OH <30 ng/ml excluding Diabetes and Chronic Kidney Disease		0.15

Table 2: Data Analysis

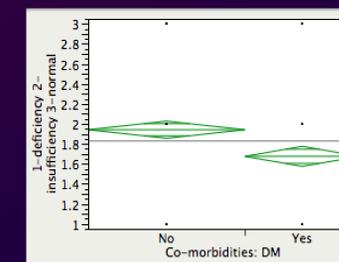


Figure 1: Oneway analysis; Diabetes as Confounder Variable for lower VitD levels (cases and controls combined)

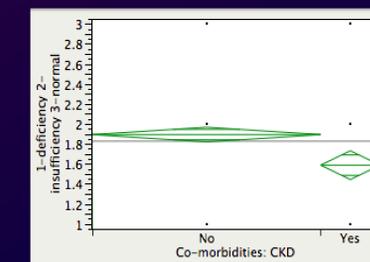


Figure 2: Oneway analysis; Chronic Kidney Disease as confounder variable for lower VitD levels (cases and controls combined)

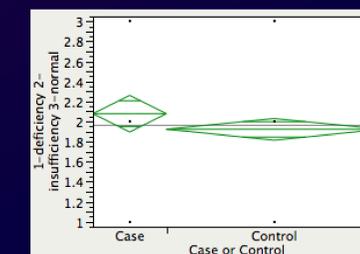


Figure 3: Oneway analysis: Diabetes and Chronic Kidney Diseases excluded.

Conclusion

There is no correlation between vitamin D deficiency and insufficiency and Coccidioidomycosis. This study also showed diabetes and chronic kidney disease as risk factors for low vitamin D levels.