



Evaluation of Vitamin D Levels in Obsessive-Compulsive Disorder

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Abstract

Vitamin D has a crucial part in calcium metabolism & has been recognized for its involvement in processes including proliferation, differentiation, and immunomodulation. Recent research has indicated that a lack of vitamin D might cause detrimental alterations in the brain & may be linked to neuropsychiatric disorders. To determine the association among low vitamin D levels & the presence of OCD, & to assess the relationship among low vitamin D levels & OCD symptoms severity & the duration of the illness. Thirty OCD patients and thirty matched healthy controls was enrolled in the research. Information was gathered from individuals diagnosed with OCD who were between the ages of eighteen and forty. The participants' vitamin D blood levels were evaluated utilizing an enzyme-linked immunosorbent test kit in the present investigation. This study demonstrates a considerable disparity in vitamin D3 levels between the patients and controls. Moreover, The prevalence of deficiency was greater among patients than controls, although the disparity was not statistically significant. We noted that there is a significant negative relationship among vitamin D3 with obsession & compulsion. We can therefore conclude that OCD is related with a deficiency in levels of vitamin D in the serum. Moreover, according to the current findings, there is no correlation among serum vitamin D levels, OCD symptoms, or severity.

Keywords: vitamin D, severity, Obsessive-Compulsive Disorder (OCD).

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1. Introduction

Vitamin D is a crucial compound that contributes to the control of calcium & phosphorus levels in the body [1]. In current years, there has been a growing interest in studying the impact of vitamin D on tissues beyond the musculoskeletal system. Vitamin D is becoming recognized as specifically affecting CNS. Vitamin D has been found to have a significant impact on the formation and control of the nervous system, according to reports [2]. Vitamin D is crucial for the proper growth and functioning of the brain. Additionally, it performs several functions inside the nervous system, including cell growth, specialization, and communication between neurons. Moreover, it has neurotrophic & neuroprotective properties [3].

Vitamin D deficiency can result in maladaptive alterations in the brain & might correlate with neuropsychiatric conditions as major depressive disorder, autism, schizophrenia, attention deficit hyperactivity disorder, & cognitive impairments [4]. The presence of a shortage in Vitamin D specifically caused a disturbance in the ability to stop repeated responses, indicating a connection between this deficiency & the occurrence of stereotyped and repetitive behaviors in illnesses like OCD & autism [5,6]. OCD is a neuropsychiatric condition that often begins in childhood or adolescence. If left untreated, it can become a chronic illness that significantly impairs functioning and increases the likelihood of developing other

mental disorders [7]. While the exact cause of OCD is still uncertain, it is believed that numerous neurochemicals, genetic factors, structural abnormalities, immunological issues, & cognitive factors contribute to the development of OCD [8,9]. The objective of our investigation was to clarify whether low levels of vitamin D are related with the presence and severity of OCD, to detect the association among low vitamin D levels & presence of OCD, OCD signs, severity & the period of the illness.

2. Patients & Methods

Study design and setting: This case control research was performed at the Psychiatry Department, Faculty of Medicine, Suez Canal University and designed to include study group of OCD cases, & control group of age & gender matched healthy controls.

2.1 Sample size:

Sample size was calculated In accordance with the following formula [10].

Where:

n = sample size, $Z_{\alpha/2} = 1.96$ (The critical value that divides the central 95 percent of the Z distribution from the 5 percent in the tail), $Z_{\beta} = 0.84$ (The critical value that separates the lower 20 percent of the Z distribution from the upper 80 percent), σ = the estimate of the standard deviation

(in the study group) = 6.61, μ_1 = mean vitamin D in the study group = 16.08, μ_2 = mean vitamin D in the control group = 21.14 [10]. So, the total sample size will be 27 participants per group. After adding 10% dropouts, the sample size will be 30 participants per group.

2.2. Inclusion criteria:

Participants in the investigation were individuals of both sexes, aged 18–40, who had recently received a diagnosis of OCD as defined by the Diagnostic & Statistical Manual of Mental Disorders, Fifth Edition (DSM V) [11].

2.3 Exclusion criteria:

Patients with other psychiatric disorders as psychosis, mood disorders, Individuals with a prior history of using psychotropic drugs, alcohol, or substances, taking calcium or vitamin D supplements in last six months, experiencing serious head trauma, having acute or chronic systemic diseases (such as epilepsy, previous use of antiepileptic drugs, clinically active infections, etc.), displaying abnormal neurological signs during daily examinations, or having a history of corticosteroid utilize for any cause will not be included in the investigation.

2.4 Study Tools

- (A) Measures for assessing obsessive–compulsive disorder
- (B) Enzyme-linked immunosorbent assay

2.5 Ethical considerations:

The research was done after approval of ethical committee of Faculty of Medicine, Suez Canal University. Every individual provided an informed written permission before participation. All the data was strictly confidential (for research purposes only).

3. Results and Discussion

Regarding our findings, there is a significant variance among both groups regarding smoking. while there is no significance among the examined groups concerning age, BMI, sex, education, and marital status. Our results supported with Mohamed et al[12].who aimed to assess the influence of sociodemographic variables on levels of vitamin D & the prevalence of hypovitamin D, as well as the correlation between this condition as well as OCD. Their study included 50 subjects, aged from 18 to 40 years. The authors stated that there was significant variance among the examined groups concerning smoking, however, they demonstrated that there was no significance variance among the examined groups concerning age, BMI, sex, education, and marital status. Regarding the impact of education, in controls, 19 participants were highly educated, while six participants were middle level of education, while in the case group, 17 participants were highly educated, six participants were of middle education, and two participants below middle education. In the same line with Jaisoorya et al., [13]. who reported that adolescents with OCD have higher psychological distress & poorer academic performance that was assumed to comorbid attention deficit

Ahmed, 2024

and hyperactivity. Naugler et al[14]. showed that average levels of 25 hydroxyvitamin D varied widely by areas of participant's residence & that the predominant predictors of this variation seemed to be age that was inconsistent with our results, which may be due to variability in dietary habits and exposure to the sun and the education level among the variables considered in that study.

The findings of Marazziti et al[15]. recommend that vitamin D may play a role in the pathogenesis of OCD, & that it may be associated with the disorder's severity, typical signs, as well as certain sex-related peculiarities. Balandeh et al[16]. who reported that The Vitamin D levels in OCD patients were somewhat lesser compared to control group, although this variance was not significant statistically (SMD = -0.63, 95 percent CI = [-1.41, 0.15]., $p = 0.11$, $I^2 = 88$ percent, $ph = 0.0002$).

This study reveals that vitamin D3 level was significantly lesser in individuals in contrast to controls. Moreover, percentage of deficient was greater between individuals in contrast to controls but without statistically significant difference. Our results were consistent with Mohamed et al[12].who demonstrated that there is a statistically significant variance among the control group & individuals concerning vitamin D level as average vitamin D level in the control group was 21.14 ± 8.78 ranging from 5 to 40 with 10 (40.0%) participants with deficient vitamin D level, 13 (52.0%) participants with insufficient vitamin D level, and two (8.0%) participants with sufficient vitamin D level, while average vitamin D level in the case group was 16.08 ± 6.61 ranging from 6.5 to 30 with 18 (72.0%) participants with deficient vitamin D level, seven (28.0%) participants with insufficient vitamin D level, with no participants having sufficient levels.

Levels of Vitamin D were considerably lesser in kids & adolescents had OCD in comparison to healthy controls, according to Esnafoglu and Yaman [17]. The symptoms of 7-year-old child had OCD were alleviated by a combination of vitamin D & iron supplementation, according to the case report. The authors were unable to determine whether the enhancement of OCD was due to the combination of vitamin D and iron or to iron alone [18]. The present research reveals that significant negative correlation among vitamin D3 with obsession & compulsion is found. In Egypt, only one previous research was performed to assess the relation between low vitamin D serum level & OCD [12].

Our results are consistent with Esnafoğlu and Yaman [17]. Bicikova et al[19]. who stated that serum vitamin D levels were significantly reduced in both the groups of individuals with depression & individuals with anxiety disorders, involving OCD, in comparison to the control group. This confirms that lower levels of vitamin D in OCD cases are negatively correlated with the severity of the disease. Our findings reveals that there is no significant variance among severity groups. Our results were similar with Mohamed et al[12]. who demonstrated that there was no significance among the case group & control group concerning OCD symptoms & severity.

Table 1: Baseline characteristics of the two examined groups.

	Cases (n=30)	Controls (n=30)	t / χ^2	p
Age (years)	30.6 ± 2.97	29.87 ± 3.65	.855	.396
BMI (kg/m ²)	28.45 ± 3.3	28.26 ± 2.17	.264	.793
Gender				
Male	14 (47.7%)	12 (40%)	.271	.602
Female	16 (53.3%)	18 (60%)		
Smokers	17 (56.7%)	9 (30%)	4.34	.037
Education				
Low	3 (10%)	1 (3.3%)	2.14	.343
Middle	12 (40%)	9 (30%)		
High	15 (50%)	20 (66.7%)		
Marital status				
Single	10 (33.3%)	12 (40%)	2.01	.366
Married	16 (53.3%)	17 (56.7%)		
Divorced	4 (13.3%)	1 (3.3%)		

a significant variance among both groups was found regarding smoking. while no significance variance among both groups was found regarding age, BMI, sex, education, and marital status.

Table 2: OCD severity.

	Cases (n=30)	
	Mean ± SD	Range
Obsession	9.8 ± 3.39	3 - 17
Compulsion	12 ± 3.27	5 - 19
Severity	N	%
Mild	4	13.3%
Moderate	15	50%
Severe	10	33.3%
Extremely severe	1	3.3%

Quantitative data were stated as mean ± SD. Qualitative data were represented as numbers & %.

Table 3: Vitamin D3 levels among the two examined groups.

	Cases (n=30)	Controls (n=30)	t	p
Vitamin D3 (ng/ml)	18.15 ± 5.06	23.55 ± 6.22	3.01	.004
Sufficient	2 (6.7%)	5 (16.7%)	3.64	.162
Insufficient	10 (33.3%)	14 (46.7%)		
Deficient	18 (60%)	11 (36.7%)		

This table revealed that vitamin D3 level was significantly lesser in cases In contrast to controls. Moreover, percentage of deficient was greater between cases In contrast to controls but without statistically significant difference.

Table 4: The relationship among levels of vitamin D3 & various parameters among cases group.

	Vitamin D3	
	r	P
Obsession	-.462	.002
Compulsion	-.357	.007

This table revealed that there was a significant negative correlation among vitamin D3 with obsession & compulsion.

Table 5: Relation among vitamin D3 levels & severity among OCD patients.

	Mild (n=4)	Moderate (n=15)	Severe (n=10)	Extremely (n=1)	p
Vitamin D3 (ng/ml)	15.67 ± 3.1	19.87 ± 5.13	20.1 ± 5.24	13.21	.284
Sufficient	0	1 (6.7%)	1 (10%)	0	.662
Insufficient	0	6 (40%)	4 (40%)	0	
Deficient	4 (100%)	8 (53.3%)	5 (50%)	1 (100%)	

This table revealed that there was no significant difference among severity groups.

Means in the same column with the same letter are not significantly different from each other at the 5% significance level.

4. Conclusions

In the present study, we can conclude that there is a correlation among low vitamin D serum level & OCD. Furthermore, based on the present results, There is no correlation among the blood vitamin D level, signs, or the severity of OCD.

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