

Vitamin D status in psychiatric patients in Karachi, Pakistan: a retrospective case notes review

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Objective: To study the serum levels of vitamin D in Pakistani psychiatric patients.

Methodology: This Observational study was carried out at Department of Psychiatry, Aga Khan University, Karachi, from January 2009 to December 2009. We reviewed medical records of 184 psychiatric patients, whose vitamin D levels were measured. Vitamin D levels were divided in three categories: deficiency (<20ng/ml), insufficiency (21-29ng/ml) and sufficiency (30ng/ml and above). Data collection form included socio-demographic details, psychiatric diagnosis and co-morbid medical diagnosis. Chi square and Fisher's Exact Test were applied to see the association between categorical variables i.e. vitamin D levels and depression.

Results: Of the 184 patients, 163 (88.6%) had low levels of vitamin D (either deficiency or insufficiency). Depression was found to be the most common diagnosis in patients with vitamin D deficiency/insufficiency (n=100, 61.34%; p=0.007) as compared to other psychiatric disorders.

Conclusion: There appears to be an association of low vitamin D levels and depression in our study group. The findings of this study are especially relevant as there is adequate sunlight throughout the year in Pakistan. There is need for larger cross sectional and prospective studies in this area in Pakistan. (Rawal Med J 201;40: 266-268).

Keywords: Vitamin D, psychiatric patients, depression, Pakistan.

INTRODUCTION

Since its discovery in 1921, vitamin D is well-known for its role in calcium homeostasis and bone health, while inadequate levels of vitamin D have been associated with bone disorders such as rickets, osteomalacia, and osteoporosis. The recent findings that most body tissues and cells including the brain have vitamin D receptors, has provided new insights into the function of this vitamin. Most of our vitamin D is produced via exposure of the skin to ultraviolet (UV) radiation through sunlight exposure, with relatively small amounts provided by dietary sources i.e. oily fish such as salmon, mackerel, and herring, and oils from fish, including cod liver oil.

Studies in countries as diverse as United States, Saudi Arabia, the United Arab Emirates, Australia, Turkey, India, and Lebanon, have indicated that 30 to 50% of children and adults have 25-hydroxyvitamin D levels under 20 ng per milliliter.ⁱⁱⁱ In Pakistan, a few studies showed a prevalence of 70-97% vitamin D deficiency in healthy asymptomatic subjects. Two studies from Karachi

and Lahore on populations excluding psychiatric patients, reported a 92% and 81% prevalence of vitamin D deficiency, respectively.

Vitamin D deficiency has also been found to be associated with a number of mental disorders such as depression, schizophrenia, and alcoholism, though the causation is not well established. Of the mental disorders, the association of vitamin D deficiency with depression appears to be the most robust. However, association is not synonymous with causation. Wilkinset al found mean vitamin D levels frankly deficient in 58% subjects and suggested an association with mood disorders. These findings have been replicated in other studies involving adults and elderly population, showing positive association between vitamin D deficiency and depression as well as cognitive impairment. Even after thorough search we couldn't find any study carried out in Pakistan addressing association of vitamin D with psychiatric disorders. The purpose of the present study was to assess the levels of vitamin D in a group of Pakistani psychiatric patients.

METHODOLOGY

This is a retrospective study was conducted at the Aga Khan University Hospital (AKUH), Karachi, Pakistan from January 2009 to December 2009. Using a computerized search program, we retrieved 12,000 psychiatric patients' records (both inpatient and outpatients) who visited in 2009. We selected records of all patients whose vitamin D levels were measured. Data collection form included socio-demographic details, psychiatric diagnosis and co-morbid medical diagnosis. Psychiatric diagnoses were made using International Classification of Diseases 10th version (ICD-10). Vitamin D levels were divided in three categories: deficiency (<20n/ml), insufficiency (21-29ng/ml) and sufficiency (30ng/ml and above). SPSS 11.5 was used for data analysis. Chi square and Fisher's Exact Test were applied to see the association between categorical variables i.e. vitamin D levels and depression.

RESULTS

Out of total sample of 12,000 patients who presented to the psychiatry services in 2009, n vitamin D levels were performed in 184 patients. Of the 184 patients, 129 (70.1%) had vitamin D deficiency, 34 (18.5%) had vitamin D insufficiency, and only 21 (11.4%) were found to have normal vitamin D levels.

Table 1. Demographics and clinical characteristics (n=184).

Variable	Value
Age	Mean age 40 years
Gender	
Male	67 (36.4%)
Female	117 (63.6%)
Marital status	
Married	119 (64.7%)
Single	51 (27.7%)
Others	14 (7.60%)
Psychiatric diagnosis	
Depression	120
Others	64
Basal metabolic rate (BMI)	
Normal (18.5-22.9)	44
Overweight (>23)	121
Underweight (<18.5)	19
Vitamin D levels	
Vitamin D deficiency (<20ng/ml)	129 (70.1%)
Vitamin D insufficiency (21-29ng/ml)	34 (18.5%)
Vitamin D sufficiency (30ng/ml & above)	21 (11.4%)

Major depressive disorder was the most common psychiatric diagnosis (n=120, 65.21%) (Table 1). Among 129 patients with vitamin D deficiency, 90 (69.76%) were overweight with BMI of more than 23.

Table 2. Vitamin D status.

Parameter	Vitamin D Deficiency (<20ng/ml) n=129	Vitamin D Insufficiency (21-29 ng/ml) n=34	Vitamin D Sufficiency (30 ng/ml and above) n=21	p
Gender				0.168
Male	42	17	8	
Female	87	17	13	
Depression	81	19	20	0.007
Others	48	15	1	
BMI				
Normal (18.5-22.9)	27	11	6	0.29
Overweight (>23)	90	20	11	
Underweight (<18.5)	12	3	4	

Of the 120 patients who were diagnosed with depression, 81 (67.5%) had deficiency, 19 (15.83%) had insufficiency and 20 (16.66%) had normal vitamin D levels. 87 (67.44%) were female (Table 2). Results showed statistically significant association between vitamin D deficiency and depression with p=0.007

DISCUSSION

Majority (88.6%) of our patients had low levels of vitamin D (either deficiency or insufficiency). Depression was found to be the most common diagnosis in patients with vitamin D deficiency/insufficiency (61.34%; p= 0.007), as compared to other psychiatric disorders. Our findings are consistent with other studies, which found low levels of vitamin D were significantly associated with higher levels of depressive symptoms or with a depression diagnosis.

The findings of this study are especially relevant in the context of Pakistan, where there is adequate sunlight throughout the year and in all seasons. For example, in Pakistan on average there are 3094 hours of sunlight annually, as compared to England where there are 1457.4 sunlight hours annually (Climate and Temperature Information 2011, Climate of the United Kingdom 2011). This clearly underscores the need for larger cross sectional and prospective studies that takes into account other variables such as diet, actual exposure to sunlight

and vitamin D metabolism in our patient population into account. For example, women in Pakistan tend to cover themselves much more due to religious and cultural reasons, so their actual exposure to sunlight may be much less. About two thirds of our sample with low vitamin D were women.

The study had several limitations: the small size of our study sample, the fact that only a small number of patients (184/12,000 or 1.53%) had their vitamin D tested and that there is no standard protocol for requesting a vitamin D level test in psychiatric patients (this depended on individual consultants). Also, the sample is from one hospital, and therefore, these results cannot be generalized to the wider Pakistani population.

CONCLUSION

There appears to be an association of low vitamin D levels and depression in our study group. The findings of this study are especially relevant as there is adequate sunlight throughout the year in Pakistan. There is need for larger cross sectional and prospective studies in this area in Pakistan.

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