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Prevalence of Vitamin D Deficiency in a patient with psychiatric Illness

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Abstract

Introduction: Vitamin D deficiency [VDID] has been reported high inpatient suffering with psychiatric illness. Good number of factors contribute to the increased prevalence of VDID in people with mental disorders from developing countries which includes intake problems, poor sunlight exposure, interfering with metabolism of Vitamin D [medication, smoking, alcohol]. This leads to development of osteoporosis, osteomalacia, muscle weakness etc. **Objectives:** To study the prevalence of vitamin D inadequacy/deficiency in 100 psychiatric patients. **Methods:** We did cross sectional evaluation of prevalence of VDID in 100 psychiatric patients and we evaluated medical co morbidity among these patients. **Results:** 30% showed deficient in vitamin D, insufficient was noted in 43% and 27% of patients it was normal. **Conclusions:** VDID was highly prevalent in our patient population. We need to add vitamin D supplementation along with the other medication.

Keywords: Vitamin D, Psychiatric illness, Nutritional deficiency.

INTRODUCTION

Vitamin D [vit D] is an essential vitamin which is required for bone metabolism, calcium and phosphorus metabolism, muscle functioning. In the body Vit D is produced by sun exposure or obtained from food in various concentrations. [1]. There are good number of factors which leads to deficiency of vitamin in person with mental illness. They could be due to diet poor in vitamin or poor exposure to sunlight or interference with formation of vitamin from sunlight [medication, smoking or alcohol]. [2,3]. As per US Endocrine Society practicle guidelines vitamin D deficiency is defined as serum 25-OH D <50 nmol/l or below 20 ng/ml] and Vit D insufficiency is defined as serum levels of 25-OH D ranging between 50 to 75 nmol/l [21–29 ng/ml]. [4] The study from US population has been reported to be 37.5% is the Vitamin D prevalence in population. They are associated with metabolic, neoplastic and immunological disorders such as atherosclerosis, diabetes mellitus and colon cancer. [5,6].

There are few studies showing Vitamin D plays a major role in maintaining mental health, human emotions and cognitive functions. [7,8] Vitamin D receptors are present in amygdale and other parts of the brain. There is an association between onset of psychiatric illness and Vitamin D deficiency. The following studies enhanced the evidence for this are from Wilkins C 2006 studies. As per the study patients with low vitamin D levels suffer from mood disorders [9]. Ganji V etc 2010 and Annweiler C etc 2010 studies have shown relationships between vitamin D deficiency and depressive symptoms or cognitive impairment. [10,11] Vitamin D deficiency is associated with Parkinson's disease, schizophreniform disorder, multiple sclerosis [MS], alzheimer's disease and autism spectrum disorders.[12] Vitamin D supplementation during early fetal growth and early childhood was shown to have a positive effect on brain.[13]

One of the major cause for vitamin D deficiency in patients with mental health problems was low exposure to sunlight [limited outdoor exercise] and reduced vitamin D in food. darker skin people, are more prone to develop Vitamin D deficiency.

METHODOLOGY

We did cross sectional evaluation of prevalence of vitamin D deficiency and medical co morbidity among mentally ill patients.

The below mentioned information was collected from patients: socio-demographic variables [age, sex,]; main psychiatric diagnosis; vitamin D serum levels and medical co-morbidities. For the study we collected informed consent from patients/ carer [if the patient is not in a condition to give consent]. The study was approved by institutional Ethical Committee Board.

We excluded confounding factors such as eating disorders or malabsorption syndrome [, inflammatory bowel disease, pancreas disorder and short bowel syndrome] from the history

To summarize descriptive statistics were used . Based on Vitamin D levels participants were then divided into three groups : 1) vit D deficiency if the levels were <10 ng/ml; 2) vit D insufficiency if the levels were between 10–29.99 ng/ml; 3) vit D adequacy if the levels were ≥30 ng/ml. The three groups were compared using chi-square tests for gender, age [< 25 and > 25yrs], and medical illness [DM, anaemia and hypothyroidism]. The significance level was set at $p < 0.05$. Here vitamin D was used as an dependent variable, named as deficiency vs. no deficiency. Statistical analyses was done by SPSS software. were performed using SPSS.

RESULT

The study sample consisted of 100 patients, of which 36 patients were males and 64 patients were females. The mean age was 39yrs in males and 35yrs in females. In deficient group the majority of patients had a diagnosis of anxiety disorder [28%]. In 29% patients had a diagnosis of depression and 16% had bipolar disorder. Remaining illness are schizophrenia or psychosis 18% and other disorder 9%

Seventy seven percent [$n = 73$] of the patients showed vit D levels below the normal range [vit D ≥30 ng/ml]. 30% of them were having Vitamin D deficiency. and 43% of them had vit D insufficiency [vit D levels = 10−30 ng/ml]. Significant relationship between vitamin D levels and gender was found [$p = 0.001$] and deficiency was more common among women. Also, significant difference was observed among age group [between <25yrs and more than 25yrs age group]. The deficient levels were more common among age group < 25 yrs. Demographic and clinical features are divided into three groups based on vitamin D levels [deficiency: <10 ng/ml; insufficiency: 10–30 ng/ml; adequacy: ≥30 ng/ml] and are presented in Table 1-5 and Figure 1. Other tables shows psychiatric illness, age group, medical co-morbidity [Table 6-7 and Figure 2].

Table 1: Distribution of age by gender among study population

Sex	Mean	SD	Min	Max	Median	p value
Male	38.9	11.3	21	65	38	0.104
Female	34.7	12.1	14	60	32	

Table 2: Prevalence of Vit D deficiency among study population

Vit D deficiency	N	Percent
Deficient	30	30
Insufficient	43	43
Normal	27	27
Total	100	100

Table 3: Distribution of Vit D deficiency and gender among study population

	Male		Female		p value
Vit D deficiency	N	%	N	%	
Deficient	11.8	11.8	40.4	40.4	0.001*
Insufficient	41.2	41.2	43.9	43.9	
Normal	47.1	47.1	15.8	15.8	
Total	100.0	100.0	100.0	100.0	

Note: * statistically significant with 5% level of significance

Table 4: Distribution of Vit D deficiency and age [yrs] among study population

	≤25		>25		p value
Vit D deficiency	N	%	N	%	
Deficient	60.0	60.0	0.0	0.0	<0.001*
Insufficient	40.0	40.0	45.7	45.7	
Normal	0.0	0.0	54.3	54.3	
Total	100.0	100.0	100.0	100.0	

Note: * statistically significant with 5% level of significance

Table 5: Psychiatric illness and Vitamin deficiency

Vit D deficiency	Deficient		Insufficient		Normal		Total
Diagnosis	**N**	**%**	**N**	**%**	**N**	**%**	**N**
SCHIZOPHRENIA AND PSYCHOTIC SP DS	5	27.8	9	50	4	22.2	18
DEP	9	31	12	41	8	27.5	29
ANXIETY DS	10	35.7	13	46.4	5	17.8	28
BPAD	7	40.0	6	40.0	3	20.0	16
MIGRAINE	0	0.0	1	50.0	1	50.0	2
DISSOCIATION	0	0.0	2	100.0	0	0.0	2
SOMATIZATION	2	40	1	20	2	40	5
TOTAL	33	33	44	44	23	23	100

Table 6: Distribution of Vit D deficiency and co morbidities by gender

Vit D deficiency	DM			Hypothyroid			Phosphorus [Increased]			Calcium[Decreased]			Anaemia		
	M	**F**	**Total**	**M**	**F**	**Total**	**M**	**F**	**Total**	**M**	**F**	**Total**	**M**	**F**	**Total**
Deficient	1	2	3	0	2	2	1	2	3	0	1	1	1	2	3
Insufficient	2	1	3	0	0	0	2	1	3	0	1	1	0	5	5
Normal	0	1	1	1	0	1	1	0	1	0	0	0	2	0	2
Total	3	4	7	1	2	3	4	3	7	0	2	2	3	7	10

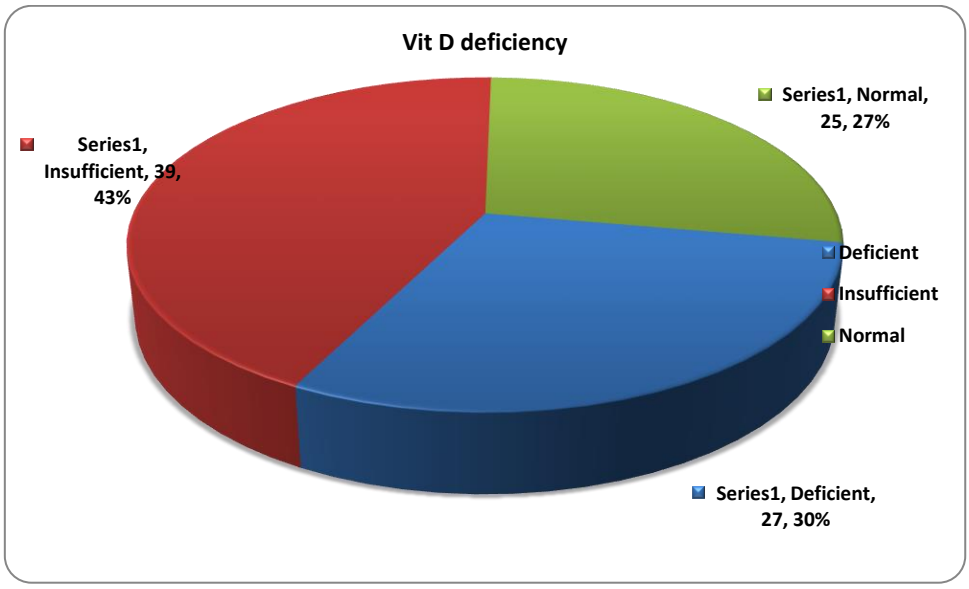

Figure 1: Distribution of age by gender among study population

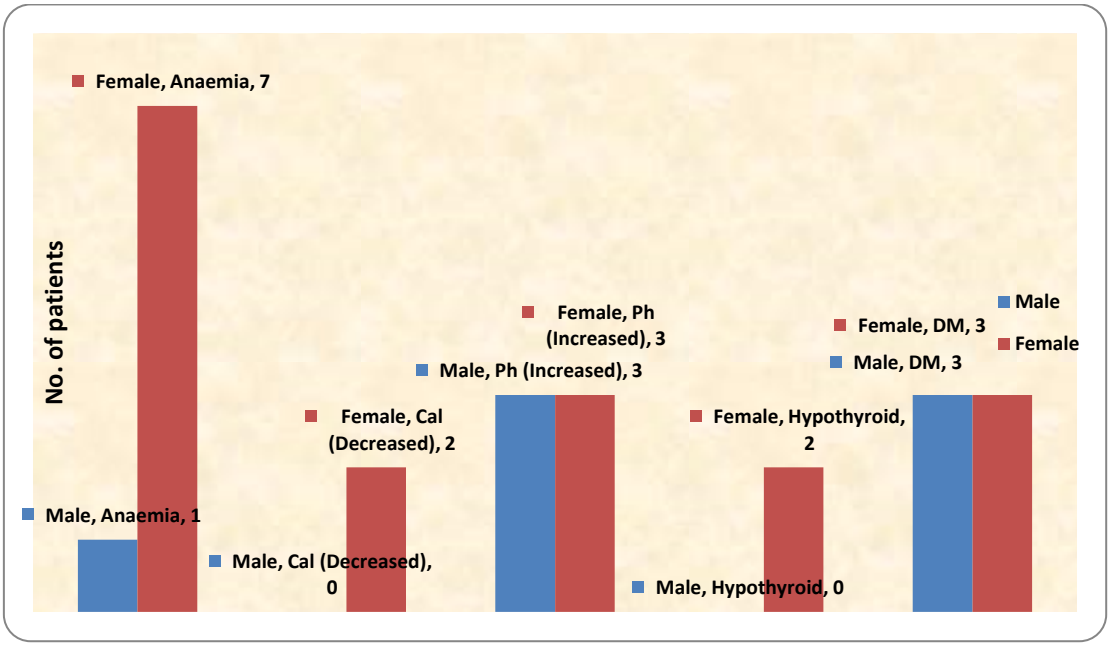

Figure 2: Distribution of Vit D deficient/insufficient cases by co morbidities and gender

DISCUSSION

We found higher prevalence of Vitamin D deficiency, with 77 out of 100 patients with mental illness and 23 patients showing adequate levels of vitamin D. Review article by P Aparna et al said that community-based Indian studies done on apparently healthy controls reported a prevalence of Vitamin D levels ranged from 50%-60% . Compared to the general population our study shows high prevalence of Vitamin D Deficiency in patients suffering with mental illness. Our results are also showing similar reported compared to other studies and indicate that Vitamin D deficiency much higher in patients with psychiatric illness than in the general population. [14,6]. Our study findings focuses on a much higher degree of concern in subjects with mental illness and point that they need be of routinely screened for vitamin D deficiency, as a part of the standard assessment . We may think of giving vitamin D supplementation to the patient with mental illness It is more cost-effective than general screening.

One of the reason for improvement in psychiatric symptoms are due to Vitamin D is believed to have therapeutic benefits. Vitamin D activates receptors on neurons which are located in regions that are implicated in human behavior regulation; it releases neurotrophin from cells and protects the brain by enhancing antioxidant and anti-inflammatory defenses against vascular injury.[15]

It is well-known that the main reason for vitamin D deficiencies are reduced sunlight exposure, reduced dietary intake, smoking, and lack of physical exercise. [5]. Many studies have shown that a patients with depression and schizophrenia illness smoke tobacco [self medication theory]very often , run a sedentary lifestyle, and practices unhealthy dietary habits [16,17]. We also found high prevalence of VDID in less than 25 yrs age group this suggest this group tend to expose to sunlight less or poor dietery factors. They are also probably vulnerable group which requires assistant for their daily care. We also found high prevalence of anemia, hypocalcaemia and hypothyroidism in female gender.

Like any other studies Our study do have limitations. They are its being cross sectional study, the evaluation of vit D levels via blood samples collected in different seasons of the year, and varying psychiatric diagnosis and socio-demographic features.

CONCLUSION

Vitamin D deficiency is highly prevalent in patients having mental illness and it is influenced by age, gender, lifestyle factors, such as poor diet, physical inactivity and tobacco usage. we also demonstrated high prevalence of medical co-morbidity among these population.

Conflicts of interest: Nil.

Authors' Contribution: All three authors have involved in planning project, implementing, data collection and analysis.

Acknowledgments: Nil

REFRENCES

1. Holick MF, Chen TC. Vitam in D deficiency: a worldwide problem with health consequences. Am J Clin Nutr. 2008: 87:1080S−6S.
2. Gordon CM, DePeter KC, Feldman HA, Grace E, Emans SJ. Prevalence of vitamin D deficiency among healthy adolescents. Arch Pediatr Adolesc Med. 2004: 158:531–7.
3. Looker AC, Johnson CL, Lacher DA, Pfeiffer CM, Schleicher RL, Sempos CT. Vitamin D status: United States, 2001–2006. NCHS Data Brief. 2011: 1–8
4. Holick M. Vitamin D deficiency. N Engl J Med. 2007: 357:266–81.
5. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2011: 96:1911–30.
6. Rosen C. Clinical practice. Vitamin D insufficiency. N Engl J Med. 2011: 364:248–54.
7. Oudshoorn C, Mattace-Raso FU, van der Velde N, Colin EM, van der Cammen TJ. Higher serum vitamin D3 levels are associated with better cognitive test performance in patients with Alzheimer's disease. Dement Geriatr Cogn Disord. 2008: 25:539–43.
8. Kalueff A, Minasyan A, Keisala T, Kuuslahti M, Miettinen S, Tuohimaa P. The vitamin D neuroendocrine system as a target for novel neurotropic drugs. CNS Neurol Disord Drug Targets. 2006: 5:363–71.
9. Wilkins C, Sheline Y, Roe C, Birge S, Morris J. Vitamin D deficiency is associated with low mood and worse cognitive performance in older adults. Am J Geriatr Psychiatry. 2006: 14:1032–40.
10. Ganji V, Milone C, Cody MM, McCarty F, Wang YT. Serum vitamin D concentrations are related to depression in young adult US population: the Third National Health and Nutrition Examination Survey. Int Arch Med. 2010: 3:29.

11. Annweiler C, Schott AM, Allali G, Bridenbaugh SA, Kressig RW, Allain P, et al. Association of vitamin D deficiency with cognitive impairment in older women: cross-sectional study. Neurology. 2010: 74:27–32.
12. Oudshoorn C, Mattace-Raso FU, van der Velde N, Colin EM, van der Cammen TJ. Higher serum vitamin D3 levels are associated with better cognitive test performance in patients with Alzheimer's disease. Dement Geriatr Cogn Disord. 2008: 25:539–43.
13. Eyles DW, Feron F, Cui X, et al. Developmental vitamin D deficiency causes abnormal brain development. Psychoneuroendocrinology 2009; 34 [Suppl 1]: S247-57.
14. Tiangga E, Gowda A, Dent JA. Vitamin D deficiency in psychiatric in-patients and treatment with daily supplements of calcium andergocalciferol. Psychiatr Bull. 2008:32:390–3.
15. Cherniack EP, Troen BR, Florez HJ, Roos BA, Levis S. Some new food for thought: the role of vitamin D in the mental health of older adults. Curr Psychiatry Rep 2009; 11: 12-19.
16. Sylvia LG, Friedman ES, Kocsis JH, Bernstein E, Brody BD, Kinrys G, et al. Association of exercise with quality of life and mood symptoms in a comparative effectiveness study of bipolar disorder. J Affect Disord. 2013: 151:722–77.
17. Heald A, Pendlebury J, Anderson S, Narayan V, Guy M, Gibson M, et al. Lifestyle factors and the metabolic syndrome in Schizophrenia: a cross-sectional study. Ann Gen Psychiatr. 2017: 16:12.