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Vitamin D Insufficiency/Deficiency in Patients on a Community Psychiatric Rehabilitation Unit

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Abstract

Vitamin D deficiency is known to have mental health consequences. There is evidence that Vitamin D deficiency/insufficiency is prevalent amongst patients with severe and enduring mental illness. In spite of this Vitamin D screening is not routinely indicated as a screening measure in psychiatric rehabilitation units in the United Kingdom. We tested the total Vitamin D serum levels in 13 out of 14 patients in a UK-based Community Psychiatric Rehabilitation unit. The objective was to quantify the prevalence of vitamin D deficiency/insufficiency in this setting and to make recommendations that could be used in clinical practice. Four of the thirteen patients were already on Vitamin D replacement therapy. Eight out of the nine patients (89%) who were not on replacement therapy were found to have insufficient or deficient levels of Vitamin D (levels of 50nmol/L or less). These results suggest that the routine screening of total serum Vitamin D levels in psychiatric rehabilitation units should be implemented. Organisations providing care to this at-risk patient group might also want to consider providing low dose Vitamin D replacement therapy in Psychiatric Rehabilitation units.

Keywords: Vitamin D, Deficiency/Insufficiency, Psychiatric, Community Rehabilitation

Introduction:

Vitamin D deficiency is prevalent amongst patients with severe and enduring mental illness (Mccue et al 2012; Rylander et al. 2012). It is associated with poor mental health (Boerman et al 2016). Insufficient vitamin D has been linked to the development of schizophrenia, depressive symptoms and cognitive impairment (Lally et al 2016). Studies have shown a prevalence of Vitamin D deficiency in patients with major Psychiatric illness (Valipour et al 2014).

Vitamin D is essential for bone metabolism. Vitamin D deficiency can lead to Osteomalacia, Osteoporosis, muscle weakness and fractures in adults. There is also an increasing evidence base that Vitamin D may have a role in the prevention of diseases such as Diabetes and Cardiovascular disease (Boerman et al 2016). Other diseases with potential connection to Vitamin D deficiency include Autism, Parkinson's disease, amyotrophic lateral sclerosis, Alzheimer's disease, and multiple

Sclerosis (Cieslak et al 2014).

There has been an association between the worsening of Negative symptoms and cognitive decline in younger adult patients with Psychosis and the levels of Vitamin D (Boerman et al 2016). Negative symptoms are a predominating feature within the treatment resistant Psychotic patients on our unit.

Vitamin D screening has not routinely been provided for patients in United Kingdom based Community Psychiatric rehabilitation Units. However, Tiangga et al. (2008) found that 100% of a sample of 17 hospitalised male psychiatric inpatients in London, UK were Vitamin D deficient. Deficiency in this study was defined as a Vitamin D level of less than 50nmol/L .

The purpose of this study was to quantify the prevalence of Vitamin D deficiency/insufficiency in a Community Psychiatric rehabilitation Unit. Individuals with insufficiency / deficiency of Vitamin D would then be established on replacement therapy as per the local guidelines (Whittington Health NHS 2012).

Methods

Thirteen out of 14 inpatients in a Community Psychiatric Rehabilitation unit [154 Camden Road] agreed to take part in this quality improvement project. One patient declined to participate in the study. Vitamin D levels were taken via phlebotomy from the 13 inpatients during the period of 6th October 2016 to 8th December 2016. The blood samples were taken as part of routine testing. As the review of the data did not interfere with patient care and all results had been anonymised with no patient identifiable information there was no need for ethical approval to be sought and patients were consented verbally. The results were discussed with all participants. Those with insufficient/ deficient levels of vitamin D were offered vitamin D replacement therapy using the Whittington Health NHS trust vitamin D guidelines.

Psychiatric diagnosis had already been established in all the patients by Psychiatrists using criteria from ICD 10.

The levels of total Vitamin D (serum 25 hydroxyvitamin D (25-OHD)) were identified via chemiluminesence immunoassay. Vitamin D deficiency was defined as total Vitamin D levels below 25nmol/L. Vitamin D insufficiency was defined as total levels between 25 and 50nmol/L. A serum level of greater than 50nmol/L was considered optimal.

Results

Thirteen out of a total of fourteen patients completed the study. Nine were male and four were female. Their ages ranged between 32 and 73 years (Mean 44, Range 36). Nine of the patients were Caucasian, two of Black Afro Caribbean descent, one of Asian Bangladeshi ethnicity and one patient of Persian ethnicity. Eight patients had an ICD 10 diagnosis of Paranoid Schizophrenia and 5 had a diagnosis of Schizo-Affective disorder. Three of the 13 patients had a comorbid Depressive Disorder and one had a comorbid Panic Disorder.

Total Vitamin D levels) ranged between 13 and 157nmol/L (Table 1). The mean total Vitamin D level was 60 (Table 2). Four of the thirteen patients were already on long term replacement therapy and had higher levels of total Vitamin D. This accounted for the large range. Eight out of the nine patients (89%) who were not on replacement therapy had insufficient or deficient levels of Vitamin D (levels of 50nmol/L or less). Six patients had insufficient levels of Vitamin D (50nmol/L or less) and were commenced on 800 units of daily Colecalciferol, following the local policy. Two patients were found to be deficient in vitamin D (less than 25nmol/L) and were commenced on 7 days of 40,000 units of Colecalciferol followed by a maintenance dose of 1000 units daily. One patient who was not receiving vitamin D supplementation had total levels of 56 nmol/l, which was within the optimum range

Three out of the four patients already on vitamin D supplementation had levels over 100nmol/L and replacement therapy was stopped as a result. One patient had a level of 78nmol/l and after discussion with them supplementation was continued.

Table 1: Total Vitamin D levels (25 OHD) with replacement strategy

Patient Number	Gender	Age	Date	Mental Health Diagnosis	Total Vitamin D nmol/L	Vitamin D Replacement Strategy Colecalciferol (IU)	Ethnicity
1	F	65	06/10/2016	Schizoaffective disorder Panic disorder	56	None	Caucasian
2	M	37	25/10/2016	Paranoid Schizophrenia	13	Yes -- 40,000 units daily for 1 week then 1000 units thereafter	Caucasian
3	M	73	28/10/2016	Paranoid Schizophrenia	157	Yes -- Already on Vitamin D replacement, and was stopped	Caucasian
4	M	55	19/11/2016	Paranoid Schizophrenia	27	Yes -- 800 units Vitamin D	Persian
5	M	32	23/11/2016	Paranoid Schizophrenia	33	Yes -- 800 units Vitamin D	Black African
6	M	40	23/11/2016	Paranoid Schizophrenia	14	Yes -- 40,000 units daily for 1 week then 1000 units thereafter	Caucasian
7	M	44	23/10/2016	Paranoid Schizophrenia Depression	115	Yes -- Already on Vitamin D replacement, and was stopped	Caucasian
8	M	38	23/11/2016	Schizoaffective Disorder Depression	134	Yes -- Already on Vitamin D replacement, and was stopped	Asian Bangladeshi
9	M	34	28/11/2016	Schizoaffective Disorder	50	Yes -- 800 units Vitamin D	Black African
10	F	44	28/11/2016	Paranoid Schizophrenia	37	Yes -- 800 units Vitamin D	Caucasian

11	F	34	29/11/2016	Paranoid Schizophrenia Depression	78	Yes -- Already on replacement	Caucasian
12	M	32	30/11/2016	Schizoaffective Disorder	32	Yes -- 800 units Vitamin D	Caucasian
13	F	44	08/12/2016	Schizoaffective Disorder	30	Yes -800 units Vitamin D	Caucasian

Table 2: Mean Scores/ Range of Vitamin D and age of participants

	Vitamin D Levels on all patients	**Age**	**Vitamin D levels on patients already on replacement**	**Vitamin D levels on patients not on replacement**	**Vitamin D levels on all female patients**	**Vitamin D levels on all male patients**	**Vitamin D levels on female patients not on replacement**	**Vitamin D levels on male patients not on replacement**	**Vitamin D levels In ages Ranging 30-50 Not on replacement**	**Vitamin D levels in ages ranging 50-80 Not on replacement**
Average Mean	59.69231	44	121	32.44	50.25	63.88	41	28.16	29.85	41.5
Range	13-157	32-73	78-157	13-56	37-78	13-157	30-56	13-50	13-50	27-56

Discussion

This was a quality improvement project looking at the prevalence of vitamin D deficiency amongst Psychiatric patients in a Community Psychiatric Rehabilitation unit. The number of patients who participated in this study was high (only one patient declined out of fourteen). The majority of patients who were not on long term vitamin D Replacement therapy were found to have insufficient/or deficient levels of Vitamin D (89%). Replacement therapy was made available to these patients.

Darker skin tones are considered a risk factor for vitamin D deficiency but the majority of our patients were Caucasian (69%) - 44% of whom were found to be deficient in Vitamin D. Thirty three percent of this group were already on long term replacement therapy so likely had previously low Vitamin D levels for replacement to be commenced.

Increased age has also been shown to be linked to vitamin D deficiency (Cieslak et al 2014) but in our study the youngest patients were found to have deficient/insufficient levels of vitamin D.

Limitations

The sample group in our study were mainly Caucasian and was not fully reflective of the ethnic minority population.

The sample size for this study was also small with only 13 patients, four of whom were already on vitamin D replacement therapy.

Additional factors such as medications, diet and outdoor activity were not assessed and future studies could make account for these.

Recommendations

Vitamin D deficiency was found to be highly prevalent in our sample group. These results are consistent with other studies concerning the prevalence of Vitamin D deficiency in patients with major Psychiatric illness (Valipour et al 2014).We recommend that total Vitamin D levels should be part of the routine screen in Community Psychiatric Rehabilitation units.

As most of our patients have been found to have a deficiency in Vitamin D another recommendation would be consider low dose replacement therapy (800 units Colecalciferol) in all patients admitted to Rehabilitation Psychiatric units.

Key Points

- Vitamin D deficiency/insufficiency in Community Psychiatric Rehabilitation units.
- Vitamin D deficiency/insufficiency has mental health consequences.
- Routine screening of vitamin D levels should be implemented in Psychiatric Rehabilitation units.
- The consideration of prescribing low dose vitamin D replacement in Psychiatric Rehabilitation units.

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Disclosures

There are no Disclosures to be made

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