ORIGINAL ARTICLE

ASSOCIATION BETWEEN VITAMIN D DEFICIENCY AND DEPRESSIVE ILLNESS IN ADULT POPULATION

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ABSTRACT

Objectives: To study association of vitamin D deficiency and depressive illness in adults.

Material and Methods: The study was conducted in a Private hospital in Hayatabad from May 2015 to December 2015. A total of 340 patients with depression were enrolled in study. Age range was 15 to 70 years. It consisted of equal number of male and female patients i.e. 170 each. Samples of bloods (4ml) were collected from these patients by vanupuncture by disposable syringe after overnight fasting and stored at -18oC. The variables which were studied are age, gender, serum levels of vitamin D, serum Ca levels and history of depression. SPSS-version-10 for windows was used to analyse the study. P value of <0.05 was considered significant statistically.

Results: 76% i.e. 258 were vitamin D deficient (cut off value 30 ng/ml). This number comprised 186(72%) females and 72(28%) males. Low serum calcium was observed among 25.5% patients with low vitamin D and depression. Among females 36.8% observed veil (Pardah) and in this group 82% had low serum vitamin D levels. Most of the female patients were from low socio-economic group.

Conclusion: Vitamin D deficiency is common in adult patients with depression.

Key Words: Vitamin D deficiency, Risk factors, depression.

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INTRODUCTION

There is significant association between depression and many health problems like disabilities and mortalities. It causes too much health care costs in developed countries depression is the third leading cause of disability[1]. It affects about 840 Million people in the world[2]. Although environmental, psychological and biological theories have been suggested for its cause[3] but still the pathophysiology of depression remains unclear. Many different mechanisms may be involved. Vitamin D in an important neurosteroid hormone which way play a significant role in development of depression. Vitamin D receptors are present on many areas of brain. This includes neurons and neuroglia of hippocampus and cingulate cortex which may have a major role in pathophysiology of depression[4].

Hypo-vitaminosis D is pandemic with estimated one billion people worldwide have this problem[5]. Vitamin D deficiency can occur in any person. It may occur both adults and children living in Europe, USA, Australia, Middle East and Asia more than 50% adults and children are at risk of Vitamin D deficiency[6-9]. Seasonal variations are found in serum vitamin D level with higher level in summer due to greater exposure to sun light[10]. Foods which are rich vitamin D include oily fish and cod liver oil[11]. Those African who live near equator where vitamin D3 synthesis is more efficient because of higher sun exposure, have sufficient vitamin D levels[12]. Obesity is associated with both higher proportion of depression and vitamin D deficiency[13]. Vitamin D deficiency is also common with anti-epileptic drugs, gluco-corticoids and fat malabsorption[14].

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MATERIAL AND METHODS

Either gender with adult patients of depression were included in study. The study was conducted in

out patient department of general medicine, Peshawar Institute of Medical Sciences, over a period of eight months from May 2015 to December 2015. Patients with hepatic, renal diseases and malabsorption were excluded from study. Patients were also evaluated for other problems specially diabetes mellitus, hypertension and obesity. No ethical issues were involved. Patients suspected of having organic brain problem were referred to neurophysicians for further management. A standardized psychiatric interview was taken for diagnosis of depression.

Once the cases were selected according to criteria, informed consent was taken from all of them. Demographic details and brief history was taken. This included dietary habits, profession, use of veil (Pardah) and exposure to sunlight. A thorough physical examination was conducted.

Four ml samples of blood was collected from these patients by venipuncture by disposable syringe after overnight fasting in morning and stored at -18°C till the time the sample was analyzed. The variables which were studied are age, gender, serum levels of vitamin D, serum Ca levels and history of depression SPSS-version-10 for windows was used for analysis. P value of <0.05 was considered to be significant statistically.

Patients having organic brain diseases like dementia and Alzheimer were not included in study and were referred to neurophysicians. Patients having serum vitamin D below 30ng/ml were labeled as low vitamin D cases. Patients above this level were considered as having normal vitamin D.

RESULTS

Total number of patients under study was 340. Age range was 15 to 70 years. Total number of 258 (76%) were vitamin D deficient (cut off value 30ng/ml). This number comprised of 186 (72%) females and 72 (28%) males. Low serum calcium (below 8mg%) was observed among 25.5% patients with low vitamin D and depression.

In our study, 248 patients belonged to rural areas and 92 were from urban areas. Vitamin D deficiency was most common among ladies coming from rural background. Moderate to severe deficiency was detected in child bearing and post menopausal age group ladies. Majority of ladies with low vitamin D levels belong to lower and lower middle socioeconomic groups. Causes of deficiencies in this group were lack of proper sun exposure, observation of veil (Pardah) and diet deficient in vitamin D and Calcium.

Table 1: Low vitamin D levels in cases of depression with socio economic status

Gender	Lower Class	Middle class	Upper class	Total
Females	102	52	32	186
Males	35	22	15	72
Total	137	74	47	258

Table 2: Ages of patients in cases of depression having low vitamin D levels

Gender	15-20	20-50	50-70	Total
Females	50	64	72	186
Males	24	19	29	72
Total	74	83	101	258

Table 3: Number of obese patients in cases of depression and low vitamin D levels

Gender	Overweight	Normal weight	Total
Female	48	138	186
Males	12	60	72
Total	60	198	258

Additional problems were detected in some patients. Twelve patients suffered from diabetes mellitus, 10.5% from hypertension and 5.5% had both of them. Majority with these comorbids were vitamin D deficient. 15.5% patients were found to be smokers, all of male sex. Obesity was detected in 48 ladies and 12 male patients having both depression and low vitamin D level.

DISCUSSION

Both hypovitaminosis D and depression are very common problems in society. Vitamin D is not only involved in musculoskeletal functions but it also has a role in non-skeletal problems like ischemic heart diseases, hypertension, diabetes mellitus and depression[15,16]. No sufficient studies have been conducted to analyze the role of hypovitaminosis D in the etiology of depression. Vitamin D is involved in many brain processes like neuro-immunomodulation, regulation of neurotropic factors and brain development[17]. Hence this is biologically possible that Vitamin D deficiency has important role in etiology of depression. Over two thirds of population of USA and Canada has sub-optimal vitamin D levels[18]. Some studies have demonstrated a strong relationship between depression and hypovitaminosis D[19,20], whereas other have shown no relationship[21,22].

In our study, out of total 340 patients of depression, those having low vitamin D levels were 258 (76%). Cut off value for vitamin D was 30ng/ml. Majority of such cases were from female gender numbering 186 (72%). Many factors contributed to this including insufficient diet and observation of veil (Pardah). Humans get vitamin D from sun light, diet and supplements[23]. Diet having supplements of Vitamin D has a major role in treatment of depression. Daily dose of vitamin D is 1000 IU. The promoter regions in serotinin genes have elements responding to Vitamin D. In hippocampus, interactions have been demonstrated between glucocorticoids receptors and vitamin D receptors. More studies need to be conducted in order to strongly establish role of vitamin D in depression, so that it would help in prevention and treatment of depression. Main cause of Vitamin D deficiency is not dietary deficiency[24] but it is lack of exposure to sunlight[25].

CONCLUSION

Vitamin D deficiency is common in cases of depression. Common causes are vitamin D deficient diet and poor exposure to sun light. The problem can be prevented and treated by correcting low vitamin D levels by dietary supplements and proper exposure to sunlight.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Alam J: Idea & date collection.

Jan SS: Statistics and bibliography.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.