

Vitamin D Deficiency in Patients with Hypothyroidism

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ABSTRACT

Aim: To determine the Vitamin D deficiency in patients with hypothyroidism

Methods: A total of fifty patients clinically presented as hypothyroidism were recruited and included in the cross sectional descriptive study conducted from Jan-2018 to March-2018 at tertiary care teaching hospital Hyderabad. The inclusion criteria were the the hypothyroid subjects [(newly diagnosed hypothyroidism (TSH>15mU/l)] of age>20 years and either gender while the exclusion criteria were the patients The exclusion criteria of the study were known cases of thyroid malignancy, chronic kidney and liver disease, the patients already on hormone replacement therapy, known cases of ovarian and uterine malignancy and the patients already on medications as iodide, amiodarone, salicylates, propranolol, anti-epileptic drugs, lithium and corticosteroids and vitamin D supplements. The relevant and specific investigations were advised and 2 ml venous blood was taken after aseptic measure and sent to laboratory for serum vitamin D level. The frequency and percentages were computed for categorical variables whereas the mean \pm SD was computed for numerical variables.

Results: During three months study period total fifty patients with hypothyroidism were recruited and studied had mean age \pm SD identified as 58.93 \pm 7.61 (yrs). Regarding gender male 15 (30%) and female 35 (70%), diabetes mellitus 25 (50%), the residence as urban 20 (40%) and rural 30 (60%), hyperlipidemia 32 (64%), hypertension 28 (56%), vitamin D deficiency 36 (72%) while the co-morbid as obesity 20 (40%), osteoporosis 26 (52%) and asthma / COPD 11 (22%).

Conclusion: The vitamin D deficiency was observed in subjects with hypothyroidism; the high proportion of severe vitamin D deficiency identified in anti-TPO positive individuals than anti-TPO negative individuals.

Keywords: Vitamin D and Hypothyroidism

INTRODUCTION

Hypothyroidism is the common endocrine dysfunction and the iodine deficiency is the common cause for hypothyroidism while with the start of iodized salt has become less common worldwide^{1,2}. Among individuals in India, the incidence of hypothyroidism reported as 3.9%, subclinical hypothyroidism 9.4% while in female, the incidence reported to be higher (11.4%) compared to male (6.2%)³. The autoimmune hypothyroidism is also observed to be common than iodine deficiency in iodine sufficient areas⁴. In subjects with Hashimoto's thyroiditis, more than 90% have anti-TPO antibodies detectable⁵. The low serum vitamin D level was seen in Pakistan although the sunlight is abundant. However, a study conducted in India shown the presence of low vitamin D in a majority of individuals.⁶ Based on facts, the below optimum level of serum vitamin D levels could be related to their skin pigmentation and poor sunlight exposure. Studies conducted on association of autoimmune hypothyroidism and serum vitamin D levels have conflicting and controversial results⁷⁻¹⁰. In Pakistan, limited literature has explained the association between vitamin D levels and hypothyroidism. Few symptoms of vitamin D deficiency overlap with hypothyroidism while the increase incidence of thyroid dysfunction and low serum vitamin D level in our population gives us a unique opportunity to determine the association among these two parameters. Thus there is a dire need to conduct this study at tertiary care hospital to determine the frequency of

vitamin D deficiency among individuals with hypothyroidism.

PATIENTS AND METHODS

The cross sectional multidisciplinary study of three months (from Jan-2018 to March-2018) was conducted at Liaquat University Hospital Hyderabad / Jamshoro on the hypothyroid subjects [(newly diagnosed hypothyroidism (TSH>15mU/l)] of age>20 years and either gender recruited by non probability consecutive sampling technique. The exclusion criteria of the study were known cases of thyroid malignancy, chronic kidney and liver disease, the patients already on hormone replacement therapy, known cases of ovarian and uterine malignancy and the patients already on medications as iodide, amiodarone, salicylates, propranolol, anti-epileptic drugs, lithium and corticosteroids and vitamin D supplements. The detail history was taken; relevant physical examination was performed while along with baseline investigations the specific investigations as thyroid function test and serum vitamin D level was advised. The purpose of the study was explained to the patients while the informed consent was taken from every participant. The data was recorded on proforma and computed in SPSS-21 to determine the mean \pm SD, percentages and frequencies.

RESULTS

During three months study period fifty subjects of hypothyroidism were recruited and studied had mean

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age±SD identified as 58.93±7.61 (yrs). The clinical and demographical profile of study population is shown in Table I.

Table 1: The clinical and demographical status of study population (n=50)

Parameter	Frequency	%age
Age (yrs)		
20-29	04	8.0
30-39	07	14
40-49	13	26
50-59	16	32
60+	10	20
Gender		
Male	15	30
Female	35	70
Diabetes mellitus		
Yes	25	50
No	25	50
Residence		
Urban	20	40
Rural	30	60
Hyperlipidemia		
Yes	32	64
No	18	36
Hypertension		
Yes	28	56
No	22	44
Vitamin d deficiency		
Yes	36	72
No	14	28
Co-morbids		
Obesity	20	40
Osteoporosis	26	52
Asthma / COPD	11	22

DISCUSSION

The prevalence of vitamin D deficiency was observed as 72% in the hypothyroid patients and these finding reveals the existence of vitamin D deficiency in the study population of hypothyroid group. The vitamin D is an immune-modulator, blocks the Th1 cells, the humoral mediated immune system, and up regulates T cells, regulates the immune system being in control^{11,12}. Thus vitamin D deficiency predisposes to autoimmune disease as Hashimoto's thyroiditis¹³. In this study, among fifty hypothyroid subjects, 14% had anti-TPO positive and 86% were anti-TPO negative. A study conducted by Tamer G, et al, revealed that there is no statistically significant difference between vitamin D level in subjects with hypothyroidism, subclinical hypothyroidism and euthyroid individuals had Hashimoto's thyroiditis¹⁴. According to the study conducted by Kivity S, et al, TSH level in subjects with Hashimoto's thyroiditis tends to have a direct concern to serum vitamin D level¹⁵. A study conducted by Bozkurt NC, et al, shown that serum level of vitamin D inversely proportional to anti-TPO level¹⁶. Thus, the results of this series closely resembles with other international studies Tamer G, et al¹⁴ and Goswami R, et al¹⁷ have found a direct correlation between hypothyroidism and vitamin D deficiency whereas the present study also further validates

the immune-modulatory role of vitamin D in patients with thyroid dysfunction.

CONCLUSION

The vitamin D deficiency was observed in subjects with hypothyroidism; the high proportion of severe vitamin D deficiency identified in anti-TPO positive individuals than anti-TPO negative individuals.

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