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RESEARCH ARTICLE

ESTIMATION OF VITAMIN D LEVELS IN HYPOTHYROID FEMALE PATIENTS IN BAQUBA CITY.

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Abstract

Vitamin D deficiency is a global health problem. Over a billion people worldwide are vitamin D deficient or insufficient. ⁽¹⁾ Its role as an immune modulator has been recently emphasized. The evidence is increasingly pointing towards vitamin D significant role in reducing the incidence of autoimmune diseases. It has been recognized to be involved in various immune functions as well as bone and muscle development. ⁽²⁾ Vitamin D deficiency has been shown to be associated with autoimmune diseases, including rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), inflammatory bowel disease (IBD), multiple sclerosis (MS) and type 1 diabetes (T1DM), and that vitamin D supplementation prevents the onset and/or development of these autoimmune diseases. ⁽³⁾ Furthermore, it was reported that patients with Hashimoto's thyroiditis, an autoimmune thyroid disease had lower vitamin D levels. ⁽⁴⁾

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Introduction:-

Vitamin D is a critical regulator of the immune system and research has already established that vitamin D deficiency is highly associated with other autoimmune diseases like Multiple Sclerosis, Type I Diabetes and with Hashimoto's hypothyroidism. ⁽⁵⁾

Vitamin D deficiency has been associated with numerous autoimmune diseases in the scientific literature. Vitamin D plays an important role in balancing the Th1 (cell-mediated) and Th2 (humoral) arms of the immune system. It does this by influencing T-regulatory (Th3) cells, which govern the expression and differentiation of Th1 and Th2 cells. ⁽⁶⁾

Vitamin D has another little-known role. It regulates insulin secretion and sensitivity and balances blood sugar. New researches showed that vitamin D deficiency is associated with insulin resistance. Insulin resistance and dysglycemia adversely affect thyroid physiology in several ways. ⁽⁷⁾

Since vitamin D is absorbed in the small intestine, a leaky and inflamed GI tract – which is extremely common in people with low thyroid function – reduces the absorption of vitamin D. ⁽⁸⁾

In order for circulating vitamin D to perform its functions, it must first activate the vitamin D receptor (VDR). The problem is that many people with autoimmune disease have a genetic polymorphism that affects the expression and

activation of the VDR and thus reduces the biologic activity of vitamin D. Studies have shown that a significant number of patients with autoimmune Hashimoto's disease have VDR polymorphisms.^(9, 11, 12) Few studies have been conducted in order to find any significant association between the levels of vitamin D and hypothyroidism and to determine whether vitamin D deficiency involves in the pathogenesis of hypothyroidism or rather a consequence of the disease and those that yielded conflicting results.

2-Patients and method:-

Serum vitamin D (25-OH) levels were measured in 56 women with hypothyroidism and 56 healthy women, utilizing the chemiluminescent method by COBAS in Baquba teaching hospital from the first of June 2016 to the first of December 2016.

Patients group and control group were divided into subgroups according to age groups; 30-39 years, 40-49 years and ≥ 50 years.

All cases included in this study were subjected to the followings:

1. Complete history taking.
2. Laboratory investigations, including: Estimation of serum TSH (euthyroid levels 0.5 – 5.0 mU/l).⁽¹³⁾ and estimation of serum 25 (OH) D levels. Vitamin D deficiency was defined as a serum level of 25OHD of ≤ 20 ng/ml and insufficiency as a serum level between >20 ng/ml and <30 ng/ml and normal ≥ 30 ng/ml.⁽¹⁴⁾

3- Statistical Analysis:

Results were statistically analyzed by SPSS 11.5 for Windows. The mean and the standard deviation (SD) for all the variables were calculated. Results considered significant or non-significant when $P >$ or < 0.05 , respectively.

Results and Discussions:-

Variable	Control group		Patients group		P value
	Mean	SD	Mean	SD	
Age	41.01	6.818	41.5	7.124	0.326
TSH	3.487	0.769	31.08	33.56	0.001
Vitamin D	30.24	2.345	14.81	8.627	0.001
Total number	56		56		

Table 4-1:- Means and SD of age, TSH, Vitamin D in control group and in patients group.

Table 4-1 showed that the means and SD for age, TSH and vitamin D. There is a very low level of vitamin D in hypothyroid patients, this agreed with other researches. Researchers conducted a study to examine the prevalence of vitamin D deficiency in patients with hypothyroidism. They found that vitamin D levels were significantly lower in those with hypothyroidism, compared with healthy adults. They also found that the degree of vitamin D deficiency was linked to the severity of hypothyroidism, the more severe the hypothyroidism, the lower the vitamin D levels.^(15, 17)

There is no statistical difference ($P > 0.05$) between groups regarding age while there are statistical differences ($P < 0.05$) between groups regarding TSH and vitamin D levels.

Age group (Years) (control)	TSH		Vitamin D		Total number
	Mean	SD	Mean	SD	
30-39	3.542	0.856	30.3	2.607	20
40-49	3.472	0.71	29.88	2.278	25
≥ 50	3.41	0.793	31.04	1.893	11

Table 4-2 Means and SD of TSH and Vitamin D in control group according to age groups.

Table 4-2 showed the means and SD of TSH and Vitamin D in control group in variant age groups.

Age group (Years) (Patients)	TSH		Vitamin D		Total number
	Mean	SD	Mean	SD	
30-39	23.453	26.486	13.891	10.332	26
40-49	33.934	37.155	15.817	6.305	19

≥50	44.22	40.0	15.269	8.157	11
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Table 4-3 Means and SD of TSH and Vitamin D in patients group according to age groups.

Table 4-3 showed means and SD of TSH and Vitamin D in patients group in variant age groups, the level of TSH is increased with age, this agreed with other study proved that; for unknown reasons, hypothyroidism overwhelmingly afflicts women, especially those between 35 and 60. Statistics show that one in eight women between the ages of 35 and 65 and one in five women over the age of 65 have some form of thyroid disease. About 26 percent of women in or near perimenopause are diagnosed with this condition ⁽¹⁶⁾. The mean of vitamin D in women aged equal and more than 50 years is less than that in 40-49 years' group, this agreed with studies concluded that; vitamin D deficiency is a common and important public health problem for older women living in the community. ^(18, 19, 20)

Conclusion and Recommendation:-

There is a deficiency of vitamin D in hypothyroid women who did not take any vitamin D supplements, so the doctor should recommend their patients to take the required vitamin D supplements.

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