

Assessing the Association between Hashimoto's and Vitamin D Deficiency in the Female Population of Georgia

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Abstract

Objective: This study aimed to analyze the association of Hashimoto's thyroiditis and vitamin D deficiency, and to assess any related factors in the female population of Georgia.

Methods: The data for this study were collected from patients who came in for routine health exams and from those who are aware of endocrinological health problems. Data collection was done from January 2020 to December 2020 at the National Endocrinology center, Tbilisi, Georgia. The diagnosis of HT was based on antithyroid peroxidase antibody levels >35 IU/ml. Also, the Vitamin D below 20 ng/ml was considered a deficiency. All the statistical analysis was calculated using SPSS.

Results: Of a total of 400 individuals who were examined, 25 confirmed cases of HT were enrolled and accessed for the Vitamin D levels. Also, another 50 non HT patients were matched and Vitamin D levels were accessed. Vitamin D concentrations in the non-HT group were found to be higher than the HT group.

Conclusion: Patients with lower levels of 25(OH)D levels are more likely to have developed HT. Hence 25(OH)D can be seen as a contributing factor for the development of HT in the female population of Georgia.

Keywords: Hypothyroidism; Hashimoto's thyroiditis; 25-hydroxyvitamin D [25(OH)D]

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Introduction

Hashimoto's thyroiditis (HT) or chronic autoimmune thyroiditis is a chronic thyroiditis disease characterized by lymphocytic infiltration, which may eventually lead to the destruction of thyroid tissues and glands [1]. HT is the most common form of thyroiditis, also the most common cause of hypothyroidism in developed countries including the US. Although the exact etiology has not been identified there have been studies that linked its association with genetic variations along with several environmental factors. There have also been studies that showed HT's association with papillary thyroid cancer [2]. At present, there has been a steady increase in cases of HT around the world [3]; since most patients do not have any symptoms; most cases of HT are then found during routine physical examination. Since most of the cases are asymptomatic, patients could present with abnormal thyroid function during the late stages of the disease, it also may be also associated with other thyroid diseases or even cancers. Therefore, it is very important that we analyze and study

the incidence of HT in the healthy female population and its relationship with Vitamin D.

Vitamin D plays a huge role in various functions of the body. It helps with calcium absorption. It is also very essential in maintaining to serum phosphate and calcium levels in the body [4]. It also helps with bone formation and bone remodeling. It should be also noted that the female body in the reproductive age undergoes vitamin D depletion more than males [5]. Many inflammatory markers were also found to be associated with Vitamin D hence supplementation with vitamin D is considered beneficial in reducing inflammatory processes [6]. It is also important that we note vitamin D deficiency is seen in all races and age groups [7], irrespective of any exposure or not. It was also noted that from recent research that Vitamin D deficiency is commonly seen in obese people hence vitamin D supplementation may be considered as a potential treatment [8]. Although vitamin D levels are not a concern for healthy people currently [9]. Since

there has been an increased incidence of HT among the Georgian population, this study aims to investigate the association between HT and vitamin D deficiency in the female population of Georgia by collecting data from healthy female subjects and currently identified HT patients using a retrospective analysis.

Materials and Methods

Data and methods

Data were collected from subjects who took health examinations in the endocrinology clinic of Dr. Shota Ganjava from January 2020 to December 2020.

Inclusion criteria: Those people who took history questionnaire. Underwent

- a) Thyroid function testing;
- b) Anti-thyroid antibody;
- c) 25(OH)D testing

Exclusion criteria:

1. Ageless 18 years or age greater 70 years;
2. Male gender;
3. Patients with a history of thyroidectomy;
4. Patients with other confirmed autoimmune diseases;
5. Patients with cancerous tumors;
6. Patients taking any other anti-thyroid or calcium or vitamin D supplements.

Clinical and laboratory assessments

The assessments were done at various levels. Weight and height were measured using a digital scale. Laboratory tests included: Serum fasting blood glucose, total cholesterol, triglycerides, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, zinc, potassium, vitamin B12, and ferritin. Serum Thyroid-Stimulating Hormone (TSH), Thyroxine (FT4), Free Triiodothyronine (FT3), Thyroid Peroxidase Antibody, (TPO-Ab) were measured using the enzyme immunoassay technique. 25(OH)D levels were also measured.

Diagnostic criteria

The diagnosis of HT is based on the below findings based on the Endocrine Society guidelines.

Antithyroid Peroxidase antibody (TPO-Ab) levels more than or equal to 35 IU/ml. 25(OH)D levels ≥ 30.0 ng/ml is classified as a vitamin D sufficiency. Between 20 and 29.9 ng/ml is classified as insufficiency, and those <20 ng/ml, as a complete deficiency.

Statistical analysis

All statistical results were calculated by SPSS for Windows. Comparisons of variables between the two groups were performed with a t-test. $P < 0.05$ was considered statistically significant.

Results and Discussion

There were a total of 400+ physical examinees from January 2020 to December 2020. 25(OH)D levels tested at the time of encounter. In total 25 subjects were enrolled on a random basis. The mean age was 48.95 ± 9.0 years old, and 100% were female. Age, fasting blood glucose, TG, HDL, ferritin, vitamin B12, and TSH were matched between the non-HT group and the HT group ($p < 0.05$). We see a clear correlation between the people having lower levels of vitamin D suffering from HT with respect to the normal healthy population ($p = 0.035$). Vitamin D deficiency was found in 71.0% of the non-HT group and 76.1% of the HT group.

Conclusion

Recent studies on this topic have been very controversial when some studies showed no association others some showed a strong and clear association with it. A research showed that vitamin D was not associated with the early stages of HT. In a different study it was found the reduced vitamin D levels in patients with HT. There also has been meta-analysis study which revealed that the vitamin D deficiency was associated to various autoimmune disorders.

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