

ROLE OF THYROID ANTIBODIES IN HYPOTHYROIDISM

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ABSTRACT

Anti-thyroid peroxides antibody and Thyroglobulin antibody is a member of thyroid autoantibodies which are important in inducing and also diagnosing autoimmune thyroid diseases. Thyroid autoimmunity can cause several thyroid disorders including Graves's disease, Hashimoto thyroiditis, atrophic autoimmune thyroiditis, hypothyroidism, postpartum thyroiditis, and thyroid-associated ophthalmopathy. Hashimoto thyroiditis and Graves disease are the two most common types, sharing many features immunologically. Anti-thyroid peroxidase antibody and Thyroglobulin antibody is important in diagnosing autoimmune thyroid diseases and judging treatment efficacy. To evaluate the relationship between serum levels of anti-TPO antibody and Thyroglobulin antibody with thyroid function test parameters (T3, T4, and TSH) in hypothyroidism patients. The levels of T3 (Mean - 157.81 and Standard Deviation - 43.99), T4 (Mean - 12.39, and Standard Deviation - 3.43) and TSH (Mean - 5.52 and Standard Deviation - 2.66) are raised anti-TPO antibody and Thyroglobulin antibody titers. A correlation between TSH and T4 levels and abnormal anti-TPO antibody and Thyroglobulin antibody was detected ($P < 0.000$) in hypothyroidism patients. Our results confirm the correlation between thyroid function test with anti-TPO antibody and Thyroglobulin antibody values, indicating suggested that, a through clinical examination and follow up of individuals with high anti-TPO antibody and Thyroglobulin antibody titer.

Keywords: Autoimmune, Anti-TPO antibody, Thyroglobulin antibody and Thyroid Disease.

INTRODUCTION

Hypothyroidism is commonly seen during outpatient practice, and the improvements in assay & increased awareness has led to the evaluation of more number of patients. Though iodine supplementation is associated with large scale benefits, concerns have been raised regarding the side effects related to varying levels of iodine intake. Literature says that iodine intake up to 1 mg/day is tolerated by normal adults. But, reports suggest that continued exposure to iodine may result in clinical conditions like goiter, thyroid dysfunction (both hypo and hyper-thyroidism), and thyroid autoimmunity.

Hypothyroidism is mostly caused by Hashimoto's thyroiditis in iodine-replete individuals or by a lack of the thyroid gland or a deficiency of hormones from either the hypothalamus or the pituitary gland. The exact etiology of this disease is not clear though it is widely believed that genetic factors can

predispose and environmental factors can trigger autoimmunity. Repletion of iodine in iodine depleted areas and chronic excess iodine intake exposure is known to trigger thyroid autoimmunity. Moreover radiation and exposure to many environmental chemicals such as persistent organic pollutants also were associated with development of thyroid autoimmunity.

Thyroglobulin antibody (TgAb) and thyroid peroxidase autoantibody (TPOAb) are the main antibodies detected in AIT. TgAb is present in high titers in sera of patients with AIT (40%–70%) [8], and TPOAb is present in the majority of AIT (>80%) [9]. currently, several factors were reported to be associated with AIT including gene, environment, diet, and diseases. Se deficiency could induce the damage of thyroid cell and the tissue. However, it is still unknown whether Se deficiency was an important condition for AIT or marker for increased AIT incidence. Therefore, the evaluation of serum anti-TPO antibody and Thyroglobulin antibody (TgAb) levels with respect to serum concentration of thyroid hormones would help in elucidating its probable pathogenic role in induction of hypothyroidism.

MATERIALS AND METHODS

In our study, we taken 75 subjects with Hypothyroidism came to the Vinayaka mission Medical College and research institute, selam, the concentrations of serum anti-TPO antibody and Thyroglobulin antibody were analyzed in Diasorin, (C.L.I.A method) and T3, T4, and TSH were analyzed in fully-Automated Chemi luminescent Micro particle Immunoassay (C.M.I.A).

DATA ANALYSIS

Table No 1 Shows that the levels of T3 (Mean - 157.81 and Standard Deviation - 43.99), T4 (Mean - 12.39, and Standard Deviation - 3.43) and TSH (Mean - 5.52 and Standard Deviation - 2.66) are raised anti-TPO antibody and Thyroglobulin antibody titers has shown in the table : 2. A correlation between TSH and T4 levels and abnormal anti-TPO antibody and Thyroglobulin antibody was detected ($P < 0.000$) in hypothyroidism patients.

Table No - 1

Shows the Mean, Standard Deviation levels of T3, T4 and TSH with Anti-thyroid peroxides antibody (anti-TPO antibody).

Test Variables	Mean	Standard Deviation	P value
T3	157.81	43.99	0.000
TPO	67.49	23.56	
T4	12.39	3.43	0.000
TPO	67.49	23.56	
TSH	5.52	2.66	0.000

TPO	67.49	23.56	
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Table No - 2

Shows the Mean, Standard Deviation levels of T3, T4 and TSH with Thyroglobulin antibody.

Test Variables	Mean	Standard Deviation	P value
T3	157.81	43.99	0.000
TGA	51.48	22.80	
T4	12.39	3.43	0.000
TGA	51.48	22.80	
TSH	5.52	2.66	0.000
TGA	51.48	22.80	

DISCUSSION

Table No - 1 reveals that in cases with high TSH concentration, have normal anti- TPO antibody and 64.45% have abnormally high anti-TPO antibody, also differences between cases with normal and high antibody titer were significant ($P < 0.0000$). According to Vander pump et al study, higher serum levels of TSH, particularly titers above 2 mIU/L, correlate with prognostic significance for development of overt hypothyroidism, considering both anti-TPO positive and negative subjects. Bjoro et al in a 20-year follow-up study found that positive anti-TPO antibody is strongly correlated with thyroid dysfunction; also the prevalence of elevated TSH was nearly 10-fold higher both in females and males having positive anti-TPO antibody compared with negative anti-TPO antibody. Kontiainen et al found elevated levels of anti-TPO antibody in 47% and 12% of samples with abnormal and normal levels of TSH, respectively.

They demonstrated that 61% of patients with hypothyroidism and 26% with hyperthyroidism had high levels of this antibody. We showed (Table no 2) that in patients with low T4, of cases had normal anti- TPO antibody, while abnormally high antibody titers ($P < 0.0000$). According to Silva et al, anti-TPO antibody is found in over 90% of patients with auto- immune hypothyroidism and Graves' disease. We showed that there is a significant correlation between TSH or T4 concentration and elevated anti-TPO antibody in the studied population ($P = 0.04$ and 0.002 , respectively). To conclude, our results confirm the correlation between thyroid function test and anti-TPO antibody values, emphasizing the clinical significance of this antibody and suggesting a through clinical examination and follow up of individuals with high anti-TPO antibody titer. In a study on prevalence of thyroid microsomal antibody (TM-Ab) in thyroid patients in CNMU, Mymensingh, Mahmood, et al. (2004) found that thyroid anti microsomal antibody (TM-Ab) was positive in 89.28% patients who had sonographic features of Hashimoto's thyroiditis or generalized 21 feature of AIT in HRUS with hypothyroid state. TM-Ab was found positive in 33.33% of patients who had HRUS features of AIT with euthyroid state.

In another study in CNMU, Mymensingh by Chakraborty (2006) on autoimmune thyroiditis among the puberty onset goiter found that among the total 36 AIT patients, 19 patients (52.78%) were hypothyroid, 8 patients (22.22%) were subclinical hypothyroid and 9 (25%) patients were biochemically euthyroid. None of the AIT patients were found in hyperthyroid or subclinical hyperthyroid state. In the present study, according to the thyroid function status, among the hypothyroid patients, there is no euthyroid and no AIT patients were found. This study revealed that there was a significant association with biochemical hypothyroid state with Anti-thyroid peroxidase antibody and Thyroglobulin antibody. In addition, for euthyroid individuals with positive autoantibody at baseline, those who developed hypothyroidism in the follow-up study had significantly higher baseline TSH levels than those who remained euthyroid. This current study also found that, in serum containing both TPOAb and TgAb, the median concentrations of autoantibodies were significant.

CONCLUSION

To conclude our results confirm the correlation between thyroid function test and anti-TPO antibody and Thyroglobulin antibody values, emphasizing the clinical significance of this antibody and suggesting a through clinical examination and follow up of individuals with high anti-TPO antibody and Thyroglobulin antibody titers. But estimation of these factors are expensive and beyond the scope of this study. Hence to address these issues for further large studies should be designed.

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