

# THE RELATIONSHIP BETWEEN ANTI-THYROIDAL PEROXIDISE ANTIBODIES AND THYROID HORMONES (T3, T4 AND THYROID STIMULATING HORMONE TSH) AMONG PATIENTS WITH AUTOIMMUNE THYROID DISEASE

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## Abstract

**Objectives:** This Study was designed to investigate the role of the auto antibodies against thyroid peroxidase (TPO-Abs) and thyroid Hormones (T3, T4, TSH) in pathogenesis of Autoimmune Thyroid Disease (AITD).

**Methodology:** Blood parameters of (90) individual who were attended to hormonal centre at AlSadder Medical City, in the period from January 2013 to June 2013 were measured, which includes Triiodothyronine (T3), Thyroxine or Tetraiodothyronine (T4), Thyroid Stimulating Hormone (TSH) and auto antibodies of thyroid peroxidase (TPO-Abs), the biostatic use difference between the maximum and minimum values (range).

**Results:** the search results showed no significant increase in the rate of thyroid hormones (T3, T4, TSH) ( $p>0.2$ ).

**Conclusion:** The auto antibodies of thyroid peroxidase has no rule in function of thyroid hormones.

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**Keywords:** Autoimmune Thyroid Disease (AITD), thyroid hormones (T3, T4, TSH), anti-thyroid peroxidase-Abs (TPO-Abs)

## Introduction

Autoimmune thyroid diseases (AITDs), including Graves' disease (GD) and Hashimoto's thyroiditis (HT), are caused by immune response to self-thyroid antigens and affect approximately (2–5%) of the general population. Genetic susceptibility in combination with external factors, such as smoking, viral/bacterial infection, and chemicals, is believed to initiate the autoimmune response against thyroid antigens <sup>(1)</sup>. Autoantibodies to thyroid peroxidase (TPO) are reflections of thyroid disease rather than causative agents . Hence, such thyroid autoantibodies may develop before the onset of clinical (AITD) and have been long known to increase the risk of developing clinical (AITD). Indeed, up to (50%) of the siblings of patients with (AITD) are thyroid antibody positive in contrast to (~15%) in the general

population<sup>(2)</sup>. Thyroxine ( T4 ) and triiodothyronine ( T3 ) are vital for normal growth and development and control essential functions , such as energy, metabolism and protein synthesis while reverse triiodothyronine ( rT3 ) is inactive hormone<sup>(3)</sup>. TSH (Thyroid Stimulating Hormone) is also known as thyrotropin. which increases thyroid secretion<sup>(4)</sup>. The secretion of TSH is controlled by:

- Circulating concentration of thyroid hormones.
- Thyrotrophin-Relasing Hormones (TRH)<sup>(5)</sup>.

The metabolic manifestations of the thyroid disease related to either excessive or inadequate production of thyroid hormones (hyperthyroidism and hypothyroidism, respectively)<sup>(6)</sup>.

Blood tests: Usually includes measurement of: serum T4 and T3, resin T3 uptake, T4 binding ratio, free T4 index, TSH, and antithyroid antibodies level<sup>(7)</sup>.

## Objectives

Perverse study was performed on (90) individual who were attended to AlSadder Medical City, in the period from January 2013 to June 2013. Three study groups were investigated which included: First group: Thirty patients with Hypothyroidism of both sexes (26 female and 4 male) their ages >15 years old. Second group: Thirty patients with Hyperthyroidism of both sexes (20 female and 10 male) their ages >15 years old. Third group: Thirty people as a control group who had no history or clinical evidence of any acute and chronic disease. All sample were kept for few minutes to allow the clotting form. Serum was separated by centrifugation at (1500) rpm and divided into small (200 µl ) aliquots and kept at deep freeze (-20 C°) to be used for different investigations by us ELISA technique.

## Results

The result of this study consist of (90) patients, (30) of them having Hashimotos disease and (30) of them Graves disease and (30) controls. The patients enrolled in this study were males and females. They were typical of patients suffering from AITD.

Table (1) showed that there were no significant correlation between anti-TPO-Ab and Thyroid hormones (T3,T4, and TSH)(p=0.954, 0.914, 0.379 respectively ) in HT patients.

Table (2) showed that there were no significant correlation between anti-TPO-Ab and Thyroid hormones (T3,T4, and TSH)(p=0.947, 0.790, 0.790 respectively ) in GD patients.

Table (3) showed that there were no significant correlation between anti-TPO-Ab and Thyroid hormones (T3,T4, and TSH)(p=0.233, 0.224, 0.204 respectively ) among control group.

Table(1) Correlation between Anti-Thyroidal peroxidase A band Thyroid hormones (T3,T4, and TSH) among HT patients.

Hormones	Anti-TPO-antibodies	
	Rang	P value
T3	0.011	0.954
T4	0.021	0.914
TSH	-0.045	0.379

Table(2) Correlation between Anti-Thyroidal peroxidase antibodies and Thyroid hormones (T3,T4, and TSH) among GD patients.

Hormones	Anti-TPO-antibodies	
	Rang	P value
T3	-0.013	0.947
T4	0.051	0.790
TSH	0.232	0.218

Table(3) Relation between Anti-Thyroidal peroxidase Ab and Thyroid hormones (T3,T4, and TSH), among control group.

Hormones	Anti-TPO-antibodies	
	Rang	P value
T3	1.3720	0.233 N.S
T4	1.1144	0.224 N.S
TSH	1.3600	0.204 N.S

## Discussion

In recent years, the pathogenic role and the diagnostic value of anti-TPO antibody have been evaluated in (AITD) patients. Most of studies show detection of anti-TPO antibody has high specificity for (AITD) and the presence of anti-TPO antibody has been noted in early (AITD)<sup>(9)</sup>. Their mean age distribution were in agreement with many studies that have been done before <sup>(8)</sup>.

Moreover, <sup>(10)</sup> shows the appearance of anti-TPO antibody in the circulation may occur at several years before (AITD) onset and anti-TPO antibody represents a marker of future (AITD). The importance of anti-TPO evokes in diagnosis of (AITD). However, present data represented these no relationships between anti-TPO antibodies and Thyroid hormones (T3,T4, and TSH ). These findings were compatible to the results reported by <sup>(11)</sup> who found that proportional correlation was noticed between anti-TPO and (AITD) marker particularly TSH. The normal levels of T3 is below 1.6 nm/l and for T4 is between (4.2-11.0 nm/l), while, the normal levels of TSH is 0.25 to 5 <sup>(12)</sup>. Serum TSH concentration are considered the most reliable indicator of thyroid function abnormalities, and TSH analysis stands as the primary means of study thyroid function. However, small changes in T4 concentration will provoke very large changes in serum TSH <sup>(13)</sup>. Because the pathogenesis of (AITD).

It is still not well clear, many studies in relation with it. Therefore, in this study we have analyzed and examined the role of an increase of anti-TPO-Ab serum level in function of thyroid hormones. However, the current findings concerning there was any increase in T3, T4 and TSH serum levels depending on concentration of anti-TPO-Ab. However, These findings were compatible to the results reported by <sup>(14)</sup> who found that strong correlation was noticed between anti-TPO and AITD marker particularly TSH. Our study was correspondence with previous studies <sup>(15)</sup> they mentioned, there are no relationship between Serum TSH concentration and anti-TPO-Ab also no association between thyroid hormones (T3, T4) and anti-TPO-Ab. This was expected <sup>(16)</sup>.

## Conclusion

There are no relationship between Serum (T3, T4, and TSH ) concentration and anti-TPO-antibodies. Anti-Thyroid Peroxidase Antibodies (IgG) a good serological marker for diagnosis of (AITD) and to be used routinely. More than one diagnostic test is required for such diseases .

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