

# ANTIMICROSOMAL AND ANTITHYROGLOBULIN ANTIBODIES IN THYROID DISORDERS

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## ABSTRACT

Antimicrosomal (TMA) and antithyroglobulin (TGA) antibodies were studied in 543 patients with various thyroid disorders and 116 controls. Thymune M and Thymune T kits of Murex were used. The study included 139 patients with Graves disease, 118 cases of primary hypothyroidism, 96 cases of euthyroid goitre, 42 cases of euthyroid multinodular goitre, 74 cases of subacute thyroiditis and 44 cases of solitary nodule thyroid. In Graves disease the overall positivity was 53.9% and 42.4% for TMA and TGA respectively. In primary hypothyroidism the positivity for TMA and TGA was 56.7% and 40.6%. Whereas in fine needle aspiration positive Hashimoto's thyroiditis it was 84.1% and 72.7% respectively. 24.6% and 27.6% of cases of simple goitre were positive for TMA and TGA respectively. The positivity in multinodular goitre was 42.8% and 38.1%, for solitary nodule it was 20.45% for both antibodies and in subacute thyroiditis it was 10.8% and 24.3% respectively. In the control group the positivity was 11.2% and 8.6% respectively. These tests are non specific and can be seen in a variety of disorders affecting the thyroid and in normal population. Their maximal utility has been in diagnosis of active Hashimoto's disease and perhaps as an indicator of disease activity in Graves disease.

**KEY WORDS :** Antimicrosomal Antibodies; Antithyroglobulin Antibodies; Thyroid Disorders.

## INTRODUCTION

Graves disease, Hashimoto's thyroiditis and primary thyroprivic hypo-thyroidism comprise a triad of related autoimmune thyroid disorders. Four types of antibodies have been demonstrated in these disorders. These are antimicrosomal antibody (TMA) directed against microsomal antigen of which the major component is thyroid peroxidase present in the apical plasma membrane of the thyroid cells [1], antithyroglobulin antibody (TGA) directed against thyroglobulin, an antibody directed against colloid antigen distinct from thyroglobulin and an antibody directed against a nuclear component of the thyroid cells. Of these TMA and TGA are being routinely evaluated in most centres [2]. The various techniques available for estimation of TMA and TGA include haemagglutination, RIA, IRMA, and ELISA. Of these the haemagglutination technique is the most convenient but is less sensi-

tive[3]. These antibodies have also been detected in normal population with incidence being higher in elderly ladies. High prevalence have also been seen in endemic iodine deficiency areas specially when these population groups are supplemented with iodine [4]. The prevalence of these antibodies in other thyroid disorders such as subacute thyroiditis, multinodular goitre, simple goitre and solitary nodule is variable and differs in various population subgroups. This study was undertaken to study the prevalence of these antibodies in our population.

## MATERIAL AND METHODS

A total of 543 patients with varying thyroid disorders reporting to our centre were studied. Diseases included Graves disease, primary hypothyroidism, euthyroid simple goitre, solitary nodule, euthyroid multinodular goitre, solitary

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nodule thyroid, and subacute thyroiditis. The patients whose fine needle aspiration cytology showed evidence of lymphocytic thyroiditis were subgrouped as Hashimoto's disease and the remainder as thyroprivic hypothyroidism. Patients with malignancies, toxic multinodular goitre, collagenosis and chronic systemic diseases such as tuberculosis were excluded from the study.

A total of 116 control patients were studied, 60 females and 56 males. These patients were disease free and were evaluated as a part of their annual medical examination.

Antimicrosomal antibodies were tested using Thymume M test kits (Murex). The test is based on Boyden's passive haemagglutination system. Tanned turkey red cells coated with thyroid microsomal antigens are agglutinated by specific antibody yielding a carpet of cells at the bottom of a microtitre well. Lack of agglutination is indicated by cells settling into a tight button. Antithyroglobulin antibodies were tested using Thymune T (Murex) kits which used the same principle. Maximal titre for TMA was 1:6553600 and for TGA was 1:5120.

## RESULTS

The control group constituted 116 patients with means age of  $34.2 \pm 12.4$  years. Five (13.8%) of 36 females showed positive titres for TMA (maximal 1:6400) and three (8.3%) were positive for TGA (maximal titre 1:1280). Overall positivity was 11.2% for TMA and 8.6% for TGA.

The Graves disease group consisted of 139 patients (89 males and 50 females), mean age  $36.8 \pm 13.4$  years. Observations are shown in Table 1.

Maximum titre obtained was 1:6553600 for TMA and 1:5120 for TGA.

TABLE 1

	Male	Female	Total
<b>TMA</b>			
Number Positive	52	23	75
% Positive	58.4	46.0	53.9
<b>TGA</b>			
Number Positive	39	20	59
% Positive	43.8	40.0	42.4
Total Patients	89	50	139

The findings in primary hypothyroidism are shown in Table 2. Of a total of 118 cases of primary hypothyroidism 96 were females and 22 males. Mean age was  $39.1 \pm 15.4$  years. Following FNAC this group was further divided into Hashimoto's thyroiditis and thyroprivic hypothyroidism. 44 (32 females and 12 males) were found to have Hashimoto's thyroiditis. The overall positivity in this group was 84.1% and 72.7% and in the thyroprivic group was 40.5% and 21.6% respectively for TMA and TGA. Overall positivity in case of primary hypothyroidism was 56.7% and 40.6% respectively for TMA and TGA. Highest titres for both TMA and TGA were obtained in the Hashimoto's thyroiditis subgroup.

There were a total of 65 cases of simple goitre (6 males, and 59 females). Mean age was  $21.8 \pm 11.7$  years. The combined positivity was 24.6% (16 cases) and 27.6% (18 cases) for TMA and TGA respectively. In the multinodular goitre group there were 42 cases (13 males and 29 females).

TABLE 2

	Hashimoto's Thyroiditis			Thyroprivic hypothyroidism			Grand Total
	Male	Female	Total	Male	Female	Total	
<b>TMA</b>							
Number Positive	9	28	37	7	23	30	67
% Positive	75.0	87.5	84.1	70.0	35.9	40.5	56.7
<b>TGA</b>							
Number Positive	9	23	32	4	12	16	48
% Positive	75.0	71.8	72.7	40.0	18.8	21.6	40.6
Total	12	32	44	10	64	74	118

Mean age was  $48.4 \pm 18.2$  years. The combined positivity was 42.8% and 38.1% respectively for TMA and TGA.

There were 44 cases of solitary nodule (euthyroid), mean age  $34.5 \pm 16.2$  years. There were five males and 39 females. The overall positivity was 20.5% (9 patients) for both TMA and TGA. Only one male patient had both these antibodies.

There were 74 cases of subacute thyroiditis, mean age  $26.3 \pm 14.2$  years. There were 26 males and 48 females. In males the incidence was 7.6% and 30.7% for TMA and TGA, while in females it was 12.5% and 20.8% respectively. Combined incidence was 10.8% and 24.3% respectively.

## DISCUSSION

TMA and TGA are definite harbingers of autoimmune thyroid disease. In Hashimoto's disease there is nearly 95% prevalence of TMA and 60% of TGA, especially in adults. In Graves disease the incidence reported is 80% and 30% respectively. Approximately 10% of normal population also exhibit these antibodies [5]. The incidence in non toxic goitre is low and generally approaches that found in general population [5]. There may be a transient increase in TMA and TGA titres in subacute thyroiditis though the general prevalence in this disorder is low [2].

In areas of endemic iodine deficiency, the profile can alter significantly. Autoimmune thyroiditis or even thyrotoxicosis (Jod-Basedow) can be in-

duced by iodine supplementation in such areas. Boukis et al [4] have reported an autoimmune reaction in upto 42.8% of cases who were treated with iodised oil. In this series we have found a relatively low incidence in Graves disease, but a high prevalence in multinodular goitre, euthyroid simple goitre and subacute thyroiditis. The introduction of iodised salt may have some bearing on this result. However, the major limitation of these antibodies is their relatively low specificity and their major role is perhaps limited to the diagnosis of Hashimoto's thyroiditis, as a prognostic marker for therapy of Graves disease and early detection of post partum thyroiditis.

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