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The Prevalence of Anti-Thyroid Peroxidase Antibodies among Patients with Thyroid Swelling with Reference to FNAC and Thyroid Hormones

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ABSTRACT

Objective: *The aim of the present study was to define the prevalence of anti-thyroid peroxidase antibodies among patients presenting with thyroid swelling and to correlate with their thyroid hormone status (free T3, free T4 and TSH) and FNAC.*

Design: *Cross-sectional study.*

Materials and methods: *30 persons with age above 13 years who presented with complaints of thyroid swelling to our outpatient department were included in our study. Tpo- Ab, free T3, free T4 and TSH were measured and FNAC of the thyroid gland was performed.*

Results: *The prevalence of anti-TPO-Ab was 53.33% with a female to male ratio of 2.2:1. FNAC of our study population with raised anti-TPO-Ab titer showed 16.66% had colloid goiter, 26.67% had Hashimotos's thyroiditis, 3.33% had Grave's disease and 3.33% had multi nodular goitre. Of the total study population 40% were in euthyroid state, 26.67% were in hypothyroid state, 23.33% were in hyperthyroid state and 10% were in subclinical hypothyroid state.*

Conclusion: *The prevalence of anti-TPO-Ab is higher in patients with thyroid swelling, suggesting thyroid autoimmunity as a risk factor for thyroid swelling. Most of the patients were in euthyroid state. Colloid goiter was the most common FNAC finding.*

INTRODUCTION

Iodine deficiency, biosynthesis defect, autoimmune disease, neoplastic and nodular diseases can each lead to thyroid swelling or goiter, although by different mechanism. Biosynthetic defects and iodine deficiency are associated with reduced efficiency of thyroid synthesis, leading to increased TSH, which stimulates thyroid growth as a compensatory mechanism to overcome the block in hormone synthesis[1]. Grave's disease and Hashimotos's thyroiditis are also associated with goiter. In Grave's disease, the goiter results mainly from the TSH-R mediated effects of TSI. The goitrous form of Hashimotos's thyroiditis occurs because of acquired defects in hormone synthesis.

Lymphocytic infiltrations and immune mediated growth factors also contribute to thyroid enlargement in Hashimotos's thyroiditis. Nodular disease is characterized by the disordered growth of thyroid cells, often combined with gradual development of fibrosis.

TPO autoantibodies are a secondary response to thyroid injury and do not cause disease themselves. They are polyclonal, and although they are of IgG class, are not restricted to one particular IgG subclass. Polyclonality mitigates against a primary role in disease, but these antibodies may be important in determining the end organ effects and may also be determinants of chronicity. Whereas TPO Ab levels correlate with lymphocytic infiltration of thyroid gland, they do not transfer disease from mother to fetus. Thus thyroid antibodies, have complement fixing cytotoxic activities, correlates with thyroidal damage and lymphocytic infiltration.

High affinity antibodies directed against TPO is found at elevated levels in the serum of patients with autoimmune thyroid disease such as Grave's disease and Hashimoto's thyroiditis [2]. FNAC of thyroid is accurate, sensitive and specific procedure as well as less expensive although it has drawback of inadequacy of sample[3]. The prevalence of anti-TPO-Ab and the thyroid function status were evaluated in this study in patients presenting with thyroid swelling.

MATERIALS AND METHODS

The study was carried out at Outpatient Department of General Medicine, Rajah Muthiah Medical college, from July 2015 to April 2016. A total of 30 patients age above 13 years presenting with thyroid swelling were included in the study. Those who were under treatment for hypothyroidism and hyperthyroidism were excluded from the study. Their FT4 [4], FT3, TSH [5] and Anti-TPO-Ab [6] titer were estimated by CLIA and FNAC of thyroid gland was done using 23 gauge needle. Based on FNAC the patients were classified into 6 groups, namely, colloid goiter, nodular goiter, multinodular goiter, Hashimoto's thyroiditis, Grave's disease and neoplasm.

RESULTS

Of the total population 23% (n=7) were males and remaining 77% (n=23) were females. Most of our study population belonged to the age group of 31-40 years (n=8) and 41-50 years (n=8). Table 1 shows the anti-TPO-titer of our study population. 46.67% (n=14) had normal anti-TPO-ab titer and 53.33% (n=16) had elevated anti-TPO-ab titer. Whereas anti-TPO-ab titer were elevated commonly in females 36.67% (n=11) comparing to males 16.67% (n=5) as similar to other studies [7]. Table 2 shows most of our study population are in euthyroid state 40% (n=12) followed by hypothyroid state 26.67% (n=8), hyperthyroid state 23.33% (n=7) and subclinical hypothyroidism 10% (n=3). Hypothyroidism is more prevalent in females 23.33% (n=7) comparing males 3.33% (n=1). Hyperthyroidism is more prevalent in males 13.33% (n=4) comparing females 10% (n=3). Table 3 shows 30% (n=9) of colloid goiter, 20% (n=20%) of nodular goiter, 10% (n=3) of multinodular goiter, 26.67% (n=8) Hashimoto's thyroiditis, 6.67% (n=2) of Grave's disease and 6.67% (n=2) of neoplasm (3.33% follicular neoplasm and 3.33% papillary carcinoma). Table 4 shows out of 15 patients with colloid nodular goiter 5 (33.33%) patients had elevated anti-TPO-Ab titer, out of 3 multi nodular goiter patients 1 (33.33%) had elevated anti-TPO-Ab titer and all patients with Hashimoto's and Graves disease had elevated anti-TPO-Ab titer.

DISCUSSION

In recent years, the pathogenic role and the diagnostic value of anti-TPO antibody have been evaluated in auto immune thyroid disorder patient. Most of studies show detection of anti TPO antibody has high specificity for auto immune thyroid disorder patient and the presence of anti TPO antibody has been noted in early auto immune thyroid disorder patient[8]. Auto immune

thyroid disorder is one of common cause for hypothyroidism; it also plays a important role in the pathogenesis of thyroid swelling. Suggesting further evaluation has to be done for underlying auto immunity along with iodine deficiency in case of thyroid swelling. All patients with FNAC features of Hashimoto's thyroiditis had higher titers of anti-TPO-ab >1000 IU/L [10], hence anti-TPO-titer may be considered as a chief investigation modality in suspected Hashimoto's thyroiditis as equivalent to FNAC. Though anti-TPO-ab titer was also expected to be raised in Grave's disease, the titer was comparatively low than Hashimoto's in our study. Elevated anti-TPO-Ab titer in thyroid swelling signifies that these patients are prone to develop hypothyroidism.

Table 1: Anti TPO Titer

Titre (0-5.61 IU/ml)	TOTAL		MALES		FEMALES	
	No. of. patients	Percentage	No. of. patients	Percentage	No of patients	Percentage
Normal	14	46.67	2	6.67	12	40
Elevated	16	53.33	5	16.67	11	36.67

Table 2: Thyroid hormone status

STATUS	TOTAL		MALES		FEMALES	
	No. of. patients	Percentage	No. of. patients	Percentage	No of patients	Percentage
Euthyroid	12	40	2	6.67	10	33.33
Hypothyroid	8	26.67	1	3.33	7	23.33
Hyperthyroid	7	23.33	4	13.33	3	10
Subclinical hypothyroid	3	10	0	0	3	10
Subclinical hyperthyroid	0	0	0	0	0	0

Table 3: FNAC

FNAC	TOTAL		MALES		FEMALES	
	No. of. patients	Percentage	No. of. patients	Percentage	No of patients	Percentage
Colloid goiter	9	30	1	3.33	8	26.67
Nodular goiter	6	20	1	3.33	5	16.67
Multinodular goiter	3	10	1	3.33	2	6.67
Hashimotos thyroiditis	8	26.67	2	6.67	6	20
Graves disease	2	6.67	2	6.67	0	0
Neoplasm	2	6.37	0	0	2	6.67

Table 4: Relationship between FNAC and anti-TPO-ab titre (total study population n=30)

FNAC	No of patients	No of patients with normal anti-TPO-ab titre	No of patients with raised anti-TPO-ab-titre (>5.61 IU/L)
Colloid goiter / nodular colloid goiter	15	10	5
Multinodular goitre	3	2	1
Hashimotos thyroiditis	8	0	8
Graves disease	2	0	2
Neoplasm	2	2	0

CONCLUSION

Anti-TPO-Ab are more prevalent among thyroid swelling which suggesting auto immunity may be the upcoming cause for thyroid swelling or goiter since iodine deficiency has been replete by national health programs. Higher titet Anti-TPO-Ab can be considered as a equivalent diagnostic tool as FNAC since it had correlated well in our study. Since this is a small scale study further large scale studies should be designed to address the demerits.

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