

## Chronic autoimmune thyroiditis: a challenging clinical entity in surgical practice

S. Rajendra

Faculty of Medicine, University of Jaffna, Sri Lanka

**Keywords:** Thyroiditis; TPO antibody; FNAC; Ultrasound examination; associated malignancy

### Abstract

#### Introduction

Chronic autoimmune thyroiditis is frequently encountered in surgical practice. However clinical data on chronic autoimmune thyroiditis has limited publications arising from Sri Lanka. This study presents our experience of this clinical entity which has differing thyroid morphologies and thyroid functional status at presentation.

#### Objective

The objective of this study was to analyse the spectrum of clinical profiles in patients with chronic auto immune thyroiditis attending at a surgical clinic. The clinical profiles analysed were the age and gender distribution, clinical presentation, thyroid functional status, thyroid peroxidase antibody (TPO Ab) status, Fine Needle Aspiration Cytology (FNAC) findings, Ultrasonographic (USS) assessment and association of thyroid malignancies. Formulation of a diagnostic guideline was also considered.

#### Study design

This is an observational study using the clinical profiles of patients with thyroid diseases registered in the surgical clinic from January 2009 to December 2018. Patients diagnosed to have chronic auto immune thyroiditis were included in this study. Different clinical profiles of these patients were analyzed.

#### Results

Out of 226 patients with thyroid diseases registered to the surgical clinic over a decade, 89 (39.4%) had chronic auto immune thyroiditis confirmed by either TPO Ab or FNAC or by both. Thyroid morphology and thyroid functional states of patients with chronic auto immune thyroiditis at presentation varied widely; 57.3%, 27% and 15.7% had diffuse goitre, multinodular goitre and solitary nodule respectively and

66.3%, 28.1% and 5.6% were hypothyroid, euthyroid and hyperthyroid state respectively. An USS of thyroid gland performed on 83 patients revealed sonographic features suggestive of thyroiditis in 67 patients (75.2%). The association between USS detected chronic autoimmune thyroiditis and the presence of hypothyroid state at presentation was statistically significant ( $p= 0.027$ ). Associated thyroid malignancies were detected in thyroidectomy specimens of 6 patients; 5 were papillary and one was follicular carcinoma.

#### Conclusion

The thyroid morphology and functional status are not unique in patients with chronic autoimmune thyroiditis. There is a risk of having associated thyroid malignancy. USS evaluation of patients could be included in the guideline for diagnosis to mitigate the challenges faced in the surgical management of chronic autoimmune thyroiditis.

#### Introduction

Chronic autoimmune thyroiditis is a common clinical problem encountered in surgical practice. Many of them presents with goitrous hypothyroidism (1). Chronic autoimmune thyroiditis has a prevalence rate of 1-4% and incidence of 3-6/10000 population per year in the western world (2). The data on thyroiditis in Sri Lanka is sparse and precise incidence and prevalence is not known. Widespread use of iodized salt could cause increasing incidence of thyroiditis (1). Females of middle age are predominantly affected by chronic autoimmune thyroiditis (3). Clinical presentation of chronic auto immune thyroiditis varies widely and thyroid auto antibodies such as anti thyroid peroxidase antibody (TPO Ab) and Fine Needle Aspiration Cytology (FNAC) assessment have been used to confirm the diagnosis (4). Differentiated thyroid carcinomas and thyroid lymphomas have been associated with chronic autoimmune thyroiditis (5).

#### Background

The first line investigation to confirm chronic auto immune thyroiditis is TPO Ab estimation. This was not available in Teaching Hospital Jaffna during the study period. As it is an expensive investigation at private laboratories, all clinically

Correspondence: S.Rajendra

E-mail: dr.s.rajendra@gmail.com

Received: 28-11-2019 Accepted: 30-12-2019

 <https://orcid.org/0000-0002-3303-603X>

DOI: <http://doi.org/10.4038/sljs.v37i4.8656>



suspected patients with chronic auto immune thyroiditis were not requested for TPO Ab estimation. FNAC is an invasive investigation and the gold standard for diagnosing chronic auto immune thyroiditis. Though it was available in Teaching Hospital Jaffna, was difficult to perform in thyroiditis patients with small and atrophic thyroid glands.

Ultra Sound Scan assessment of thyroid is a noninvasive investigation, which not only identifies chronic auto immune thyroiditis but also could provide information about nodules suspicious of malignancy.

There are no clear guidelines in the management of chronic autoimmune thyroiditis and decision making in these patient could be challenging. This study aimed to formulate a suitable diagnostic guideline for effective surgical management based on the analyses of the spectrum of clinical profiles in patients with chronic auto immune thyroiditis.

### Study design

This is an observational study, that has been carried out in a single surgical clinic of Department of Surgery, Teaching Hospital Jaffna from January, 2009.

Clinical profiles of patients with thyroid diseases registered in the surgical clinic from January 2009 to December 2018 were maintained in a database. Patients diagnosed with chronic auto immune thyroiditis were included in this study.

Clinical profiles analysed were the biographical data (age and sex) of patients, presenting complaints (including symptoms of altered thyroid function, musculoskeletal and neuropsychiatric symptoms), clinical signs related to altered thyroid function and thyroid morphology (diffuse, solitary nodule and multinodular goitre), investigation results (TPO, FNAC, USS) and histopathology reports of thyroid specimens of patients who underwent thyroidectomy.

TSH (thyroid stimulating hormone) (normal values 0.27-5.5 IU/ml), FNAC and USS of thyroid were carried out at the Pathology and Radiology Departments of Teaching Hospital Jaffna. Anti thyroid peroxidase (anti TPO) (normal values <35 IU/ml) was performed in those patients who were affordable and were willing to do it in private sector. It was estimated by ELISA (Enzyme Linked Immunosorbent Assay) method, using USA made BRIO Elisa analyzer reagent kit.

Different clinical profiles of chronic autoimmune thyroiditis were compared with local and international data to find out any unique difference in the prevalence of clinic-pathological parameters in the region. Statistical analysis of clinical parameters were done using IBM SPSS 21 and p-value < 0.05 was considered as statistically significant.

### Results

Total number of patients with thyroid diseases registered to the surgical clinic over a decade was 226. Among them 140 patients had clinical suspicion of chronic auto immune thyroiditis and of them 89 had chronic auto immune thyroiditis confirmed by TPO Ab or by FNAC or by both.

Age and sex distribution of patients diagnosed to have chronic auto immune thyroiditis.

Among the 89 patients with chronic auto immune thyroiditis, there were 83(93.3%) females and 6(6.7%) male patients and the mean age of 39.27 years (ranging from 13 to 69 years).

**Table 1.** Age and sex distribution of patients with thyroiditis

Age group	No of patients (n=89)	Female	Male
1-20 years	8(8.9%)	8(8.9%)	0(0%)
21-40 years	41(46%)	38(42.7%)	3(3.4%)
41-60 years	34(38.2%)	32(38.2%)	2(2.2%)
61-80 years	6(6.7%)	5(5.6%)	1(1.1%)

### Clinical presentation of patients with chronic auto-immune thyroiditis in this study

**Table 2.** Spectrum of presenting problem in patients with thyroiditis

Presenting problem	No of patients (n=89)
Neck lump only	73(82%)
Neck lump + Musculo skeletal symptoms	2(2.2%)
Neck lump + Hypothyroid features	5(5.6%)
Painful neck lump	9(10.1%)

### Thyroid morphology of patients with chronic auto-immune thyroiditis in this study

**Table 3.** Spectrum of thyroid morphology in patients with thyroiditis

Morphology	No of patients (n=89)
Diffuse goitre	51 (57.3%)
Solitary nodule	14 (15.7%)
MNG	24 (27.0%)

### Thyroid functional status of patients with chronic auto immune thyroiditis in this study

Euthyroidism has been defined as TSH levels within the reference range of 0.32–5.06 mIU/L ( $0.32 \leq \text{TSH} \leq 5.06$ ). Other thyroid test results such as  $\text{TSH} > 5.06$  mIU/L and  $\text{FT4}$  of 0.91–1.55 ng/dL,  $\text{TSH} > 5.06$  mIU/L and  $\text{FT4} < 0.91$  ng/dL,  $\text{TSH} < 0.32$  mIU/L and  $\text{FT4}$  between 0.91–1.55 ng/dL,  $\text{TSH} < 0.32$  mIU/L and  $\text{FT4} > 1.55$  (ng/dL) were considered as subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism, respectively (6). In our study subclinical hypothyroidism and overt hypothyroidism were considered as hypothyroidism and subclinical hyperthyroidism and overt hyperthyroidism were considered as hyperthyroidism.

**Table 4.** Distribution of thyroiditis patients according to thyroid functional status

Thyroid functional status	No of patients (n=89)	Female	Male
Euthyroid	25 (28%)	23	2
Hypothyroid	59 (66%)	55	4
Hyperthyroid	5 (6%)	5	0

**66% of patients with chronic auto immune thyroiditis were hypothyroid at presentation**

#### TPO Ab in patients with chronic autoimmune thyroiditis in this study

TPO Ab estimation is the first line investigation to confirm the diagnosis of chronic autoimmune thyroiditis. Among 89 patients with chronic autoimmune thyroiditis, only 38 patients got their TPO Ab estimation done.

**Table 5.** Distribution of patients with thyroiditis according to TPO Ab status

TPO Ab status		Number of patients	Female	Male
Test performed (n=38)	Positive	35	32	3
	Negative	3	3	
Test not performed		51	48	3

**Out of 38 patients who had their TPO Ab test done 35(92.1%), had positive results (TPO Ab +)**

#### FNAC of thyroid in patients with chronic autoimmune thyroiditis in this study

FNAC was performed to 80 patients at the Department of Pathology. Since TPO Ab test was not available at TH Jaffna, FNAC was the mainstay of investigation to confirm thyroiditis.

**Table 6.** Spectrum of FNAC findings in patients with thyroiditis

FNAC finding		No of patients (n=89)
FNAC performed	Thyroiditis	76 (85.4%)
	Colloid nodule	2 (2.2%)
	Normal thyroid	2 (2.2%)
FNAC not performed		9 (10.2%)

**80 patients had their FNAC done and 76 of them (95%) had cytological evidence of chronic autoimmune thyroiditis.**

**Table 7.** Thyroiditis patient distribution based on FNAC and TPO Ab (n=29)

FNAC	TPO Ab +	TPO Ab -
Thyroiditis +	22	3
Thyroiditis -	4	0

**29 patients had both FNAC and TPO Ab tests done. 4 of them who did not have FNAC evidence of chronic autoimmune thyroiditis had TPO Ab in their serum. 3 of them who had FNAC evidence of chronic autoimmune thyroiditis did not have TPO Ab in their serum.**

**Table 8.** Association of diagnostic investigations with thyroid functional state

Investigation		TPO (n= 38)		FNAC (n= 80)		USS (n=83)	
		+	-	+	-	+	-
Thyroiditis							
Thyroid Functional State	Euthyroid	10	01	23	01	18	06
	Hypothyroid	24	02	49	03	47	07
	Hyperthyroid	01	00	04	00	02	03
Not done		51		9		6	

**Among the 35 patients with positive TPO Ab test, 24 (68.6%) were hypothyroid at presentation.**

There was no statistically significant association between TPO Ab status and the thyroid functional state of patients (Fisher's exact test p-value=1.0).

Out of 76 patients who had cytological evidence of chronic autoimmune thyroiditis 49 patients (61.25%) were hypothyroid at presentation (p=0.856).

Among the 89 diagnosed patients, 83 had their USS assessment of thyroid gland. 67 patients (75.2%) with chronic autoimmune thyroiditis had USS features suggestive of the diagnosis. Sixteen patients (17.9%) did not have USS features suggestive of thyroiditis. Six patients (6.7%) did not have an USS assessment of thyroid. The association between USS detected chronic autoimmune thyroiditis and the presence of hypothyroid state at presentation was statistically significant (p=0.027).

#### Associated thyroid malignancies in chronic autoimmune thyroiditis patients

Among the 89 patients with chronic autoimmune thyroiditis, 12 underwent thyroidectomy and the histopathology reports were analysed. Three patients (3.4%) with chronic autoimmune thyroiditis had associated papillary thyroid carcinomas. Furthermore, of 21 patients who were clinically suspicious of chronic autoimmune thyroiditis without TPO Ab and FNAC confirmation, 4 underwent thyroidectomy for suspicious thyroid nodule on USS evaluation. Histopathology report of three of these thyroid gland specimens revealed the presence of thyroid malignancy with chronic autoimmune thyroiditis; two were papillary carcinomas and one was a follicular carcinoma.

Hence, overall thyroid malignancies were detected in association with chronic autoimmune thyroiditis in 6 thyroidectomy specimens; 5 were papillary and one was follicular carcinoma.

#### Discussion

The term “thyroiditis” includes a group of heterogeneous disorders characterized by inflammation of thyroid gland. Thyroiditis predominantly affects women. The clinical course of thyroiditis may be chronic, subacute and acute, depending on the underlying cause (5). Chronic thyroiditis includes chronic autoimmune thyroiditis and Riedel's Thyroiditis. Subacute thyroiditis includes painless postpartum thyroiditis, painless sporadic thyroiditis & painful sub-acute thyroiditis whereas acute thyroiditis will encompass acute suppurative thyroiditis (7).

Chronic autoimmune thyroiditis, painless postpartum thyroiditis and painless sporadic thyroiditis have an autoimmune basis (8).

Dr. Hakuru Hashimoto described enlargement and lymphoid transformation of thyroid in 4 women in 1912 (“struma lymphomatosa”) and identified antithyroid antibodies. This was named Hashimoto's disease or Hashimoto's thyroiditis, which is currently classified as chronic autoimmune thyroiditis (8).

Chronic autoimmune thyroiditis has two clinical forms, a goitrous form and an atrophic form. Both are characterized by the presence of thyroid auto antibodies in serum and by varying degrees of thyroid dysfunction; they differ only in the presence or absence of goitre (8). About 10% of patients with chronic autoimmune hypothyroidism have atrophic thyroid gland (7).

**Table 9.** Comparison of epidemiological data on thyroiditis with other regional studies

Country	% of total patients with thyroid disease	Female : Male	Mean age in years
USA (9) Staii et al	13.4%	11.7:1	47
India (10, 11) Thomas et al Sood et al	Not available 31.4%	8.6:1 10:1	34.18 (range 21-30)
Sri Lanka (1,3) Samarawickrama et al Siriveera et al Rajendra	12% 5.9% 39.4%	42:1 10.3 : 1 13.8:1	33 43.3 39.27

**The prevalence of chronic autoimmune thyroiditis among the patients with thyroid diseases in this study in Jaffna is relatively high when compared to the data with loco regional studies.**

**Table 10.** Comparison of clinical presentation of thyroiditis with other regional studies

Clinical presentation of patients with chronic autoimmune thyroiditis	% of patients in loco-regional studies (10,12)	% of patients in this study in Jaffna
Neck lump only	69.4% ( Thomas et al, India )	82%
Neck lump + Musculo skeletal symptoms	25.5% ( Becker et al, USA)	2.2%
Neck lump + Hypothyroid features	8.3% ( Thomas et al, India )	5.6%

Most common presentation of patients with chronic autoimmune thyroiditis in Jaffna was goitre (neck lump) and only very few had musculoskeletal symptoms when compared with studies in loco-regional countries. Patients with chronic autoimmune thyroiditis presenting with hypothyroid symptoms at presentation were comparable to

that in India. Though patients with chronic autoimmune thyroiditis characteristically presents with painless neck lump, in 10.1% of the patients in this study presented with painful neck lump.

**Table 11.** Comparison of thyroid morphology with other regional studies

Country	Goitre			No goitre
	Diffuse	MNG	STN	
<b>India (13,10)</b>				
Chandanwale et al (n=110)	66.3%	30.9%	2.7%	-
Thomas et al (n=144)	47.2%	19.4%	2.7%	30.5%
<b>Sri Lanka (1)</b>				
Samarawickrama et al (n=43)	23.3%	48.8%	20.9%	7%
Rajendra (n=89)	57.3%	27.0%	15.7%	-

Keeping in par with the loco-regional studies, diffuse goitre is the characteristic thyroid morphology in patients with chronic autoimmune thyroiditis in Jaffna. Anyhow, patients with chronic autoimmune thyroiditis in Jaffna presenting with solitary nodule of thyroid is not uncommon.

**Table 12.** Comparison of thyroid functional status with other regional studies

Country	Thyroid functional status based on TSH		
	Hyperthyroid	Euthyroid	Hypothyroid
<b>USA(9)</b>			
Staii et al (n=102)	None	46%	54%
<b>India (10)</b>			
Thomas et al (n=140)	21.4%	32.8%	45.7%
<b>Sri Lanka (1)</b>			
Samarawickrama et al (n=43)	2.3%	48.8%	48.8
Rajendra (n=89)	5.6%	28.1%	66.3%

Majority of patients with chronic autoimmune thyroiditis in this study in Jaffna had hypothyroidism at presentation.

More patients with chronic autoimmune thyroiditis have high serum TPOAb than thyroglobulin antibody (14). TPO Ab is also found in sera of about 10% of normal adults, with an increasing prevalence (up to 30%) in older adults and thus low titers of TPO Ab is not specific for diagnosis (15). TPO Ab is directly involved in thyroid cells damage and positively correlated with the activity of chronic autoimmune thyroiditis (15). TPO Ab is found in over 90% of patients with autoimmune hypothyroidism (16).

A distinctive characteristic, supporting the clinical diagnosis of chronic autoimmune thyroiditis, is the presence of TPO Ab. Anyhow; it is present only in 50% of chronic autoimmune thyroiditis patients who are euthyroid (17). When chronic autoimmune thyroiditis is suspected clinically, a test for TPO Ab and measurement of the serum TSH (thyrotropin) concentration are generally sufficient to confirm the diagnosis (8).

**Table 13.** Comparison of TPO Ab and thyroid functional state with other regional studies

Country	Patients with TPO Ab +	Patients with TPO Ab + who have Hypothyroidism
<b>USA</b>		
Staii et al (9)	29	21 (72.4%)
<b>Iran</b>		
Ghoraishian et al(15)	866	281 (32.4%)
<b>India</b>		
Sood et al (11)	61	42 (68.8%)
<b>Sri Lanka</b>		
Rajendra	35	24 (68.6%)

Prevalence of hypothyroidism in TPO Ab positive patients in this study in Jaffna seems similar to that in loco-regional countries except that found in Iran.

#### FNAC assessment of chronic autoimmune thyroiditis

Fine Needle Aspiration Cytology (FNAC) is considered as the gold standard technique to diagnose chronic auto immune thyroiditis (13).

Hurthle (oxyphilic) cell change, infiltration of follicles by lymphocytes / plasma cells , epithelioid granuloma with giant cells and lymphoid follicle formation and moderate amount of background colloid are the features characteristic of chronic auto immune thyroiditis (Hashimoto's thyroiditis) (18).

Fine needle aspiration cytology (FNAC) has an **accuracy rate of 92%** in diagnosing chronic autoimmune thyroiditis (19). FNAC can miss the diagnosis of chronic auto immune thyroiditis in few cases due to inherent limitations of this procedure and also due to varying cytomorphological features such as with other lesions like multinodular goiter with degenerative changes, follicular neoplasm, Hurthle cell neoplasm, papillary carcinoma, reactive lymphnode and lymphoma (20).

FNAC can have false negative and false positive rates. The false negative rate (FNR) is the percentage of patients reported to have benign cytology by FNAC, who are found to have a malignant lesion confirmed on thyroidectomy. FNR ranges from 1.5 to 11.5%. The false positive rate (FPR) is the percentage of patients reported to have thyroid malignancy by

FNAC, who are found to have a benign lesion on histological examination. FPR ranges from 1.2% to 6% (19).

In this study in Jaffna, 80 patients diagnosed to have chronic autoimmune thyroiditis underwent FNAC assessment and 76 of them (95%) had cytological evidence lymphocyte infiltration. In a study carried out in India, 55 out of 65(84.6%) patients had cytological evidence lymphocyte infiltration (11).

*FNAC and hypothyroidism*

**Table 14.** Comparison of FNAC and hypothyroidism with regional studies

Country	FNAC + and elevated TSH
<b>USA</b> Staii et al(9)	53.9%
<b>India</b> Sood et al (11)	63.07%
<b>Sri Lanka</b> Rajendra	64.5%

*FNAC and TPO Ab*

**Table 15.** Comparison of FNAC and TPO Ab status with other regional studies

Country	FNAC + and TPO Ab +
<b>USA (9)</b> Staii et al	65%
<b>India</b>	
Sood et al (11)	78.5%
Thomas et al(10)	87.7%
<b>Sri Lanka</b>	
<b>Colombo</b> Fernando et al(21)	65%
<b>Jaffna</b> Rajendra	75.8%

Lymphocytes that can produce antithyroid antibodies could be found in the thyroid glands of patients with chronic autoimmune thyroiditis without evidence of a peripheral immune response (ie TPO Ab – ve and FNAC + ve). This suggests that the possibility of chronic autoimmune thyroiditis to exist as an organ-restricted autoimmune disorder (22). Three patients who had FNAC evidence of

chronic autoimmune thyroiditis in this study did not have TPO Ab in their serum.

Sometimes there is lack of correlation between TPO Ab levels and FNAC diagnosis of chronic autoimmune thyroiditis especially in children and young adult patients. This could be because that in early stage of disease, antibody production is confined to intrathyroidal lymphocytes (Organ restricted). Likewise some patients with significant titres of TPO Ab may not have FNAC proven chronic autoimmune thyroiditis (ie TPO Ab + ve and FNAC - ve). This could be due to the fact that focal lymphocytic thyroiditis (Focal Auto Immune Thyroid Disease) which is an early lesion that can be missed by FNAC (10). Four patients who did not have FNAC evidence of chronic autoimmune thyroiditis in this study had TPO Ab in their serum.

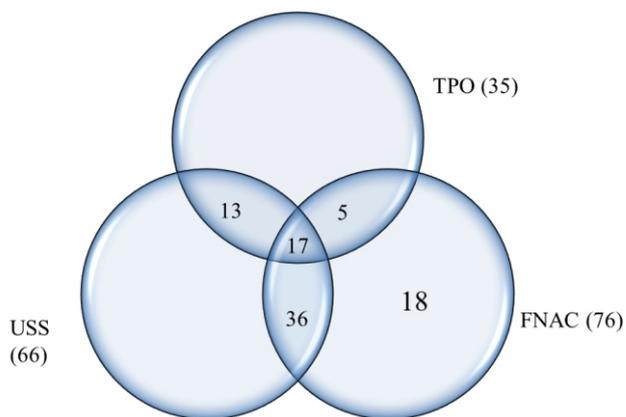
**Ultrasonographic assessment of thyroid in patients with chronic auto immune thyroiditis**

Characteristic USS findings in chronic autoimmune thyroiditis are hypo-echogenicity, coarse echo-texture, increased vascularity and micronodules. Echogenicity of thyroid is compared to the strap muscles. Normal thyroid gland is uniformly hyperechoic. In chronic autoimmune thyroiditis the thyroid gland is classified as hypoechoic as its echogenicity will be equal to or less than the strap muscles. Normal thyroid has fine echo-texture whereas it will have coarsened echotexture in chronic autoimmune thyroiditis. Nodules in Hashimoto's thyroiditis are known as micronodules and their size will be ≤6 mm. Although the other similar nodules that are hyper and hypoechoic are included as micronodules yet the solitary nodules and dissimilar nodules are not classified as micronodules. Colour Doppler is used to assess thyroid vascularity (23).

Hypoechogenicity and increased vascularity are most sensitive parameters to diagnose Hashimoto's thyroiditis where as micronodules were most specific parameter for the diagnosis. Coarsened echo texture has an intermediate sensitivity and specificity for diagnosis of Hashimoto's thyroiditis by ultrasonography (23). The USS examination is 78.5% sensitive and 95.2% specific in diagnosing chronic autoimmune thyroiditis. The positive and negative predictive values of USS examination for chronic autoimmune thyroiditis are 88% and 90.9%, respectively. The overall accuracy of USS in diagnosing chronic autoimmune thyroiditis is 90.1% (23). It was 74.2% in this study.

**Need for a guideline to assess patients with chronic auto immune thyroiditis**

In a study performed at a tertiary hospital in Sri Lanka, it was shown that the sensitivity of ultrasonography in diagnosing thyroiditis was 89.47% while the specificity was 96.3%. Its positive predictive value was 94.4% (24). Features



**Figure 1.** Positive investigation results among thyroiditis patients in this study at a glance

considered to suggest malignancy in a thyroid nodule are hypoechoogenicity, solid consistency, greater nodular height than width, presence of micro calcifications, absence of peripheral halos or presence of an interrupted halo, presence of intranodular vascularity and presence of peripheral vascularity. It has also been shown that combination of these ultrasonographic characteristics will improve the diagnostic accuracy of identifying malignant nodules in thyroid (24).

In this study, 4 patients underwent thyroidectomy for suspicious nodule on USS evaluation. Histopathology report of three thyroid gland specimens of these patients revealed the presence of thyroid malignancy with chronic autoimmune thyroiditis. These three patients did not have positive finding in either TPO Ab or FNAC test.

As chronic autoimmune thyroiditis has a risk of associated malignancy it could be useful to have guidelines for its diagnosis and management.

**Suggested guideline for diagnosing patients with chronic autoimmune thyroiditis**

TPO Ab, USS and thyroid function tests (TFT) can be used to evaluate chronic autoimmune thyroiditis and FNAC can be performed on any suspicious lesion to detect existence of associated malignancy.

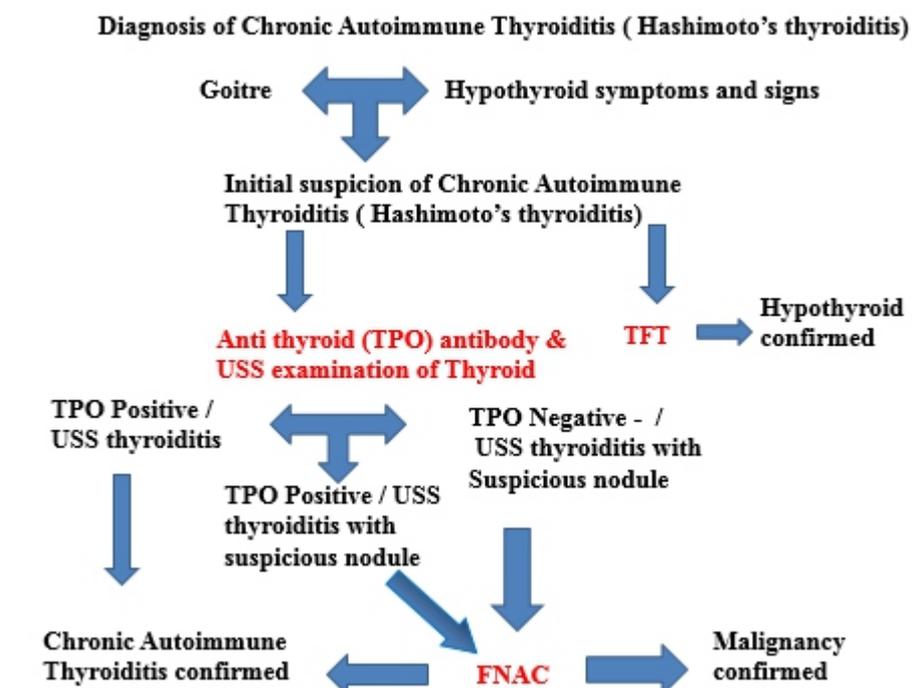
**Conclusions**

The following conclusions could be made from this study on the spectrum of clinical profiles in chronic autoimmune thyroiditis in a cohort of patients from Jaffna:

- The thyroid morphology and functional status are not unique in patients with chronic autoimmune thyroiditis.
- Females are mostly affected especially in the 20-40 years of age.
- Many of the patients have diffuse goitre and hypothyroidism at presentation.
- There is a risk of having associated thyroid malignancy.
- USS evaluation of patients could be included in the guideline for diagnosis.

**Limitations**

- The study was conducted in a single surgical clinic and this may not represent the entire patient population with thyroid diseases in Jaffna.



**Figure 2.** Suggested guideline for diagnosing patients with chronic autoimmune thyroiditis

- TPO antibody test was not performed in all cases clinically suspected to have chronic autoimmune thyroiditis.
- The yield of FNAC of thyroid may differ according to the experience of the cytologist.
- The USS assessment for thyroiditis may be subjected to observer variations.

### Recommendations

A larger population study is warranted for further evaluation of above conclusions and finalizing the diagnostic guideline for chronic autoimmune thyroiditis.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

### References

1. Samarawickrama MB, Perera BL. Thyroiditis: can we depend on the clinical features to diagnose?. *Galle Medical Journal*. 2009 Oct 8;14(1). <https://doi.org/10.4038/gmj.v14i1.1171>
2. Krishna M. Cytomorphological and biochemical correlation in thyroiditis. *Thyroid*. 2003;13:485-9.
3. Siriweera EH, Ratnatunga NV. Profile of Hashimoto's thyroiditis in Sri Lankans: is there an increased risk of ancillary pathologies in Hashimoto's thyroiditis?. *Journal of thyroid research*. 2010;2010. <https://doi.org/10.4061/2010/124264>
4. Parvathaneni A, Fischman D, Cheriya P. Hashimoto's thyroiditis. In *A New Look at Hypothyroidism 2012* Feb 17. IntechOpen. <https://doi.org/10.5772/30288>
5. Bates M, Allahabadia A. *Thyroiditis. Surgery (Oxford)*. 2003 Dec 1;21(12):303-4. <https://doi.org/10.1383/surg.21.12.303.25165>
6. Amouzegar A, Gharibzadeh S, Kazemian E, Mehran L, Tohidi M, Azizi F. The prevalence, incidence and natural course of positive antithyroperoxidase antibodies in a population-based study: Tehran thyroid study. *PloS one*. 2017 Jan 4;12(1):e0169283. <https://doi.org/10.1371/journal.pone.0169283>
7. Pearce EN, Farwell AP, Braverman LE. *Thyroiditis. N Engl J Med*. 2003 Jun 26;348(26):2646-55. <https://doi.org/10.1056/NEJMra021194>
8. Dayan CM, Daniels GH. *Chronic autoimmune thyroiditis. N Engl J Med*. 1996 Jul 11;335(2):99-107. <https://doi.org/10.1056/NEJM199607113350206>
9. Staii A, Mirocha S, Todorova-Koteva K, Glinberg S, Jaume JC. Hashimoto thyroiditis is more frequent than expected when diagnosed by cytology which uncovers a pre-clinical state. *Thyroid research*. 2010 Dec;3(1):11. <https://doi.org/10.1186/1756-6614-3-11>
10. Thomas T, Sreedharan S, Khadilkar UN, Deviprasad D, Kamath MP, Bhojwani KM, Alva A. Clinical, biochemical & cytomorphologic study on Hashimoto's thyroiditis. *Indian J Med Res*. 2014 Dec;140(6):729.
11. Sood N, Nigam JS. Correlation of fine needle aspiration cytology findings with thyroid function test in cases of lymphocytic thyroiditis. *Journal of thyroid research*. 2014;2014. <https://doi.org/10.1155/2014/430510>
12. Becker KL, Ferguson RH, McConahey WM. The connective-tissue diseases and symptoms associated with Hashimoto's thyroiditis. *N Engl J Med*. 1963 Feb 7;268(6):277-80. <https://doi.org/10.1056/NEJM196302072680601>
13. Chandanwale SS, Nair R, Gambhir A, Kaur S, Pandey A, Shetty A, Naragude P. Cytomorphological Spectrum of Thyroiditis: A Review of 110 Cases. *Journal of thyroid research*. 2018;2018. <https://doi.org/10.1155/2018/5246516>
14. Mariotti S, Anelli S, Ruf J, Bechi R, Czarnocka B, Lombardi A, Carayon P, Pinchera A. Comparison of serum thyroid microsomal and thyroid peroxidase autoantibodies in thyroid diseases. *The Journal of Clinical Endocrinology & Metabolism*. 1987 Nov 1;65(5):987-93. <https://doi.org/10.1210/jcem-65-5-987>
15. Ghoraishian SM, Moghaddam SH, Afkhami M. Relationship between anti-thyroid peroxidase antibody and thyroid function tests. *World J Med Sci*. 2006;1:44-7.
16. Iddah MA, Macharia BN. Autoimmune thyroid disorders. *ISRN endocrinology*. 2013 Jun 26;2013. <https://doi.org/10.1155/2013/509764>
17. Sanyal D. Spectrum of Hashimoto's thyroiditis: Clinical, biochemical & cytomorphologic profile. *Indian J Med Res*. 2014 Dec;140(6):710.
18. Bhatia A, Rajwansi A, Dash RJ, Mittal BR. Lymphocytic Thyroiditis-is cytological grading significant? A correlation of grades with clinical, biochemical, Itrasonographic and radionuclide parameters. *Cytojournal*. 2007;4:10. <https://doi.org/10.1186/1742-6413-4-10>
19. Gayathri BN, Kalyani R, Harendra KM, Krishna PK. Fine needle aspiration cytology of Hashimoto's thyroiditis-A diagnostic pitfall with review of literature. *J Cytol/Indian Academy of Cytologists*. 2011 Oct;28(4):210. <https://doi.org/10.4103/0970-9371.86353>
20. Priyanthi Kumarasinghe M, De Silva S. Pitfalls in cytological diagnosis of autoimmune thyroiditis. *Pathology*. 1999 Jan 1;31(1):1-7. <https://doi.org/10.1080/0003130299105430>
21. Devaka Fernando, The clinical epidemiology of thyroid disease in Sri Lanka, *Journal of the Ceylon College of Physicians*, 1997,30; 1 & 2,22-26
22. Baker JR, Saunders NB, Wartofsky L, TSENG YC, Burman KD. Seronegative Hashimoto thyroiditis with thyroid autoantibody production localized to the thyroid. *Ann Intern Med*. 1988 Jan 1;108(1):26-30. <https://doi.org/10.7326/0003-4819-108-1-26>
23. Kapali A, Beerappa J, Raghuram P, Bangar R. Diagnostic accuracy of ultrasound imaging in Hashimoto's thyroiditis. *Thyroid Research and Practice*. 2017 Jan 1;14(1):28. <https://doi.org/10.4103/0973-0354.200567>
24. Rosairo S. Autoimmune Thyroiditis: Radiologist's point of view. *Sri Lanka Journal of Radiology*. 2016 Aug 25;2(1). <https://doi.org/10.4038/sljr.v2i1.27>