International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Hashimoto's Thyroiditis: A Correlation of Cytolomorphology with Clinical, Biochemical & Radiological Findings

Dr. Ranjini Kudva[1], Dr. Manjari Kishore[2]

[1]Professor & Head of Department, Department of Pathology, Kasturba Medical College Manipal, Karnataka, India

[2]Junior Resident, Department of Pathology, Kasturba Medical College, Manipal, Karnataka, India

Abstract: ***Introduction**: Hashimoto's thyroiditis one of the most common causes of goiter & hypothyroidism, basically, is an autoimmune disorder, the hallmark being lymphocytic infiltration of thyroid follicles resulting in an autoimmune glandular destruction. This is seen more commonly in middle aged & young females. Clinically, it presents as a diffuse or nodular swelling being usually asymptomatic along with symptoms of hypothyroidism. Fine needle aspiration cytology (FNAC) is a simple, cost effective procedure & plays a significant role in diagnosis of chronic lymphocytic thyroiditis. **Aims & Objective of study**: To grade Hashimoto's thyroiditis on cytology and study its significance in predicting thyroid injury. **Materials & Methods**: 50 patients were retrospectively studied over a period of 6 months and clinical, biochemical, radiological data were evaluated and grading was done based on Bhatia's Grading system. Results: Of 50 patients, 47 were female. 29 of 50 patients had grade I lymphocytic thyroiditis. Many patients with grade I & II were asymptomatic (37/50; 74%) and presented with diffuse goiter (43/50; 86%). Most of the patients presented with diffuse enlargement of thyroid gland. Majority of patients with hypoechoic nodules on USG showed grade II lymphocytic thyroiditis on cytological examination. Conclusion: Hashimoto thyroiditis (HT) is present in an unexpectedly large no. of individuals. It is important to diagnose HT as patients subsequently become hypothyroid & require lifelong thyroxine supplementation. Chronic lymphocytic thyroiditis is the second most common thyroid lesion next to goiter & one of the most common cause of hypothyroidism. A combined approach of cytological grading of Hashimoto's Thyroiditis along with ultrasonography and biochemical levels can detect subclinical hypothyroid state & provide a guide to therapy.*

Keywords: Hashimoto thyroiditis, lymphocytic thyroiditis, FNAC, hypothyroidism, autoimmune disorder.

1. Introduction

Hashimoto's thyroiditis, an entity, was first described by Hakaru Hashimoto in 1912. It is synonymous with chronic lymphocytic thyroiditis and autoimmune thyroiditis. It is one of the most common causes of goiter & hypothyroidism, basically an autoimmune disorder and the hallmark being lymphocytic infiltration of thyroid follicles resulting in an autoimmune glandular destruction. Genetic and environmental factors are responsible for the causation of disease. This is seen more commonly in middle aged & young females and is ten times more common than it was in early 1990s.

Clinically, it presents as a diffuse or nodular swelling being usually asymptomatic along with symptoms of hypothyroidism. Diagnosis usually involves demonstration of thyroid peroxidase antibody. Life-long treatment with thyroxine replacement is necessary. Fine needle aspiration cytology (FNAC) is a simple, cost effective procedure & plays a significant role in diagnosis of chronic lymphocytic thyroiditis which is a non-surgical condition. Herein, we make an attempt to study the cytomorphological, clinical, biochemical and radiological features of patients with Hashimoto's thyroiditis and grade the cytological features.

2. Aim of the Study

a) To grade chronic lymphocytic thyroiditis on FNAC smears.
b) To know their significance in predicting thyroid injury by comparing with clinical, biochemical and ultrasonography findings.

3. Materials & Methods

a) **Study type:** Retrospective study
b) **Study population:** 50 patients
c) **Study period:** 6 months
d) **Study place:** KMC, Manipal.

Inclusion Criteria
Newly diagnosed cases of chronic lymphocytic thyroiditis.

Exclusion Criteria
- Subjects receiving either thyroxine or any other drug known to interfere with thyroid function at the time of evaluation
- Old cases of chronic lymphocytic thyroiditis.
- Any other additional lesions observed in association with chronic lymphocytic thyroiditis diagnosed on cytology.

a) Thyroid function test was used to determine blood concentration of thyroid hormones T3, T4, TSH.
b) Ultrasound of thyroid gland was performed.
c) Fine Needle Aspiration Cytology was done.
d) Smears with diagnosis of chronic lymphocytic thyroiditis were graded into 3 grades using Bhatia et al grading system on cytology.

4. Bhatia Et Al Grading System

This grading system was utilized in the present study. This is as follows.

a) **Grade morphological features-**

- Grade 1 (***mild***): few lymphoid cells infiltrating the follicles/increased no. of lymphocytes in the background
- Grade 2 (***moderate***): moderate lymphocytic infiltration or mild lymphocytic infiltration with hurthle cell/giant cells/anisonucleosis
- Grade 3 (***severe***): Florid lymphocytic inflammation with germinal centre formation, very few follicular cells left.

5. Results

In the present study, fifty patients were included. Of 50 patients, 47 patients were female and maximum patients were in the age group 41-50 years. Age & sex-wise distribution of patients are demonstrated in Table no. 1.

Table 1: Distribution of number of cases as per age & sex

Age interval	Total cases	Male	Female
11-20	2	-	2
21-30	6	-	6
31-40	16	1	15
41-50	22	1	21
51-60	3	1	2
61-70	1	-	1
Total	50	3	47

It was observed that maximum number of cases (29 of 50 cases) had grade I chronic lymphocytic thyroiditis. The distribution of grades are depicted in Table no 2.

Table 2: Distribution of cases as per cytomorphological grades

Grades of chronic lymphocytic thyroiditis	No. of cases
I	29
II	14
III	07
Total	50

As per the cytomorphological features, chronic lymphocytic thyroiditis can be divided into three grades as mentioned above. The cytological images depicting different grades are shown in Fig 1-3. The criteria used is taken from Bhatia et al guidelines.

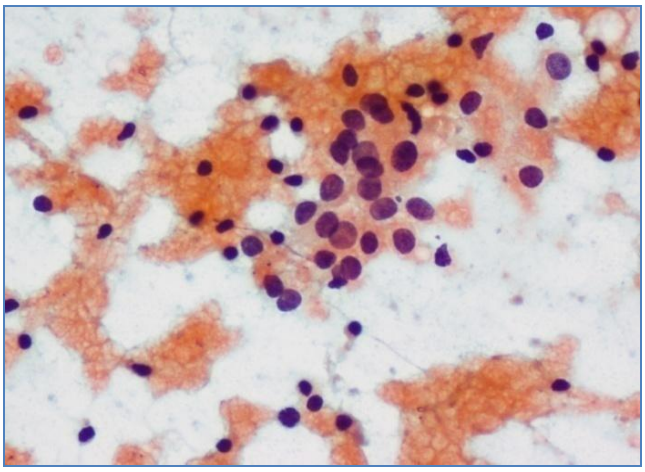

Figure 1: Thyroid follicular cells with mild lymphocytic infiltration (Pap X 200) [grade-1]

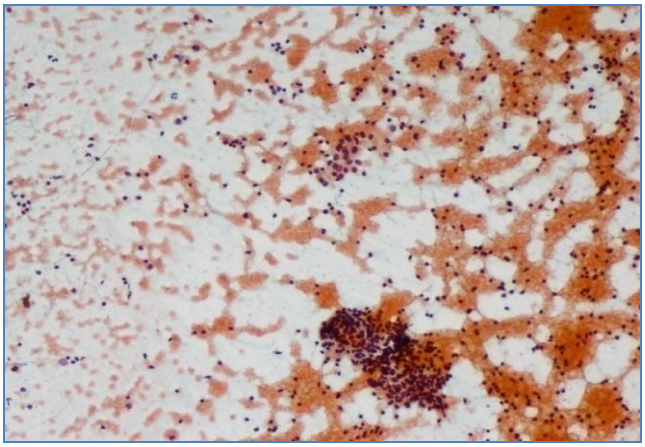

Figure 2: Thyroid follicular cells with moderate lymphocytic infiltration in background (Pap X100) [grade2]

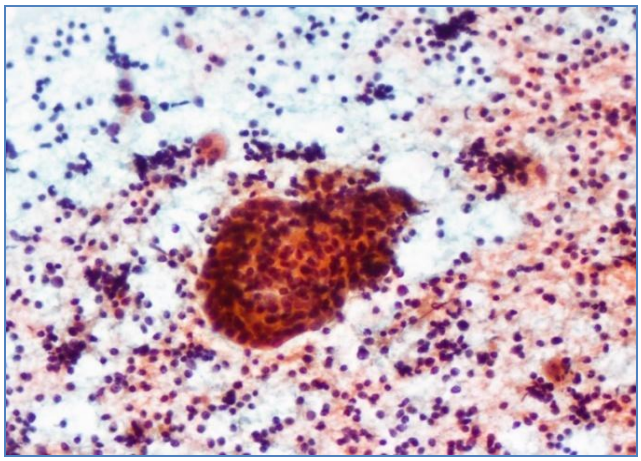

Figure 3: lymphocytic thyroiditis with florid lymphocytic infiltration (Pap X 100) [grade 3]

Many patients with grade I & II were asymptomatic (37/50; 74%) and presented with diffuse goiter (43/50; 86%). The sign, symptoms and various clinical presentation observed in patients are presented in Table no. 3. Most of the patients presented with diffuse enlargement of thyroid gland, which was noted on physical examination. Rest of the patients had different symptoms like pain & difficulty in swallowing as mentioned below in table no. 3.

Table 3: Distribution of cases as per sign, symptoms & cytomorphological grades

Grades	No of pts	Diffuse enlargement of thyroid	symptoms
I	29	23 of 29	25/29 were asymptomatic; 3 had difficulty in swallowing, 1 had pain.
II	14	13 of 14	8/14 were asymptomatic; 6 had difficulty in swallowing
III	07	7 of 7	4/7 were asymptomatic, 3 with pain on swallowing
	50	43 of 50	37/50 were asymptomatic

The thyroid hormonal status was also noted in these fifty patients and it was significant to note that maximum patients (32 of 50) were hypothyroid, of which 20 had grade II chronic lymphocytic thyroiditis. The distribution of patients based on thyroid hormonal status and cytomorphological grades is shown in Table no. 4.

Table 4: Distribution of patients as per thyroid hormonal status & cytomorphological grade

GRADES OF CHRONIC LYMPHOCYTIC THYROIDITIS	EUTHYROID	HYPOTHYROID	HYPERTHYROID
I	9	11	2
II	4	20	1
III	1	1	1
Total	14	32	4

Apart from the thyroid hormonal status, hormonal levels were also assessed. These levels are shown in Table no. 5. It was noted that 29 of 50 patients had grade I lymphocytic thyroiditis with maximum (20 cases) having increased TSH levels. In patients with grade II & III lymphocytic thyroiditis also maximum patients presented with increased TSH levels. However, few patients also showed normal or decreased TSH levels.

Table 5: Distribution of cases as per grades of lymphocytic thyroiditis & TSH levels

Grades of thyroiditis	No. of patients	Normal TSH(N-0.7-7 µIU/mL)	TSH levels (increased)	TSH levels (decreased)
I	29	7	20	1
II	14	4	8	3
III	7	1	4	2
Total	50	12	32	6

Of 50 patients observed, 38 showed hypoechoic, diffuse & micronodules on ultrasound, 5 cases showed hyperechoic micronodules and rest 7 had normal ultrasound findings. Majority of patients with hypoechoic nodules on USG showed grade II lymphocytic thyroiditis on cytological examination. The distribution is shown in Table no 6.

Table 6: Distribution of cases as per radiological findings & cytological grades

Grades of HT	Hypoechoic (diffuse & micronodules)	Hyperechoic micronodules	Normal study
I	8	2	5
II	23	3	2
III	7		
Total	38	5	7

There was a statistical significance between the grades of lymphocytic thyroiditis & biochemical features as well as with ultrasound features. Thyroid function test revealed hypothyroidism with elevated TSH in 64% of cases (32 of 50 cases).
In the present study, the clinical, radiological, biochemical findings correlated well with the cytomorphological results.

6. Discussion

Hashimoto's thyroiditis, also known as Hashimoto's disease, chronic lymphocytic thyroiditis is an autoimmune condition. It was named after Dr. Hakaru Hashimoto, who first described this condition in 1912. This entity is part of spectrum of autoimmune disease and the most common cause of goitrous hypothyroidism, especially in non-iodine deficient area.

As far as the pathogenesis of this diseases is concerned, there is aggressive destruction of thyroid cells by various cell- and antibody mediated immune processes. Though exact cause why it occurs is not known, various environmental factors which trigger the autoimmune thyroid disease include iodine, medication, infection, smoking, stress, etc.

The further impairment of thyroid function can be attributed to antibody binding to and blocking the TSH receptor, which results in inadequate thyroid hormone production & secretion. Initially, there can be slight increase in T3, T4 levels, which could be because of leakage of these hormones into circulation from damaged cells. Association with HLA-DR5 has also been established.

The exact incidence of Hashimoto's Thyroiditis is unknown, may be around 0.3-1.5 cases/1000 population per year. It is around 15-20 times more commonly seen in women as compared to men, especially around 30-50 years of age. It can be seen in any age group, including children.

The patients may present with enlarged thyroid gland which can enlarge rapidly. Sometimes, due to increase in size of gland, there can be associated dyspnea, dysphagia, due to pressure on structure in neck or mild pain or tenderness. The goiter of Hashimoto's disease may remain unchanged for many years but usually increases in size. Sometimes, patients

can present with features of thyrotoxicosis, usually in the initial course of disease.

The common symptoms associated with hypothyroidism can be noticed in the patients like, fatigue, constipation, dry skin, cold intolerance, weight gain, loss of energy, menstrual irregularities, depression, memory loss, eventually leading to atrophy of thyroid glands.

Diagnosis of Hashimoto's Thyroiditis can be made on the basis of clinical features, biochemical, radiological findings and cyto- or histological appearance. There is diffuse lymphoplasmacytic and plasma cell infiltration with formation of lymphoid follicles, follicular hyperplasia, and damage to the follicular basement membrane. On cytology, there is lymphocytic impingement on thyroid follicular cells and hurthelisation can be noted.

Other markers which can aid in the diagnosis are TSH, which is usually raised in hypothyroidism due to Hashimoto's thyroiditis. Anti-TPO and Anti- thyroglobulin can also be demonstrated.

Though ultrasound is not diagnostic, it can be helpful in assessing size of thyroid gland, echotexture and presence of thyroid nodules. Hashimoto's Thyroiditis can be seen associated with many other autoimmune conditions like Addison's disease, Diabetes mellitus, hypogonadism, primary biliary cirrhosis, systemic sclerosis, etc.

Association of Hashimoto's Thyroiditis with carcinoma is controversial and not well established. Patients require thyroid replacement therapy with l- thyroxine. Sometimes, patients may require surgery when size of gland is very much increased causing obstructive symptoms or associated malignant nodules are noted.

There can be associated complications like hyperlipidemia, Hashimoto's encephalopathy, myxedema coma and over treatment with thyroxine can cause accelerated bone loss and increased heart rate.

The overall prognosis of the patients with Hashimotos's Thyroiditis is excellent and normal thyroid hormonal levels can be achieved with proper thyroxine replament therapy.

7. Conclusion

Chronic lymphocytic thyroiditis is the second most common thyroid lesion next to goiter, & one of the most common causes of hypothyroidism. FNAC is simple, cost effective, safe and a sensitive & specific diagnostic tool in diagnosing Hashimoto's thyroiditis. Cytological grading of chronic lymphocytic thyroiditis helps in assessing the severity of the disease & can predict the thyroid functional status. Asymptomatic and subclinical hypothyroid cases are associated with grade I and II chronic lymphocytic thyroiditis on cytology, whereas overt hypothyroid cases are associated with grade II & III chronic lymphocytic thyroiditis. A combined approach of cytological grading of Hashimoto's Thyroiditis along with ultrasonography and biochemical levels can detest subclinical hypothyroid state & provide a guide to therapy.

References

[1] Alka Bhatia, ArvindRajwanshi, Radharaman J Dash, Bhagwant R Mittal and Akshay K Saxena. Lymphocytic thyroiditis – is cytological grading significant? A correlation of grades with clinical, biochemical, ultrasonographic and radionuclide parameters. Cyto Journal 2007, 4:10.
[2] Baker BA, Gharib H, Markowitz H. Correlation of thyroid antibodies and cytologic features in suspected autoimmune thyroid disease. Am J Med. 1983 Jun;74(6):941–944.
[3] Nguyen GK, Ginsberg J, Crockford PM, Villanueva RR: Hashimoto's Thyroiditis: Cytodiagnostic accuracy and pitfalls. Diagn Cytopathol 1997, 16:531-6.
[4] Marcocci C, Vitti P, Cetani F, Catalano F, Concetti R, Pinchera A. Thyroid ultrasonography helps to identify patients with diffuse lymphocytic thyroiditis who are prone to develop hypothyroidism. J Clin Endocrinol Metab 1991; 72:209-213.
[5] Solymosi T, Toth GL, Bodo M: Diagnostic accuracy of fine needle aspiration cytology of the thyroid. Acta Cytol 2001, 45:669-74.
[6] Friedman M, Shimaoka K, Rao U, Tsukada K, Gavigan M, Tamura K: Diagnosis of lymphocytic thyroiditis (nodular presentation) by needle aspiration. Acta Cytol 1981, 25:513-22.
[7] Kumar N, Ray C, Jain S: Aspiration cytology of Hashimoto's thyroiditis in an endemic area Cytopathol 2002, 13:31-9.

Author Profile

Dr. Manjari Kishore, is a final year Resident (M.D.) in Dept. Of Pathology, Kasturba Medical College, Manipal, (576104) Karnataka, India