Original Article

Clinicopathological Study of Hashimoto Thyroiditis: Retrospective Study in a Tertiary Care Hospital

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Abstract

Background: Hashimoto thyroiditis is an autoimmune disease in which thyroid cells are destroyed by both cell mediated and antibody mediated processes. It is the most common cause of hypothyroidism in iodine sufficient areas with an incidence of 0.3 -1.5 /1000 per year. During the histopathological evaluation of HT, thyroid neoplasms including papillary thyroid carcinoma (PTC) are detected incidentally which is currently one of the primary area of research in thyroid pathology. This study aimed to explore the role of histopathological study along with its correlation with clinical presentation , biochemical and radiological parameters in the diagnosis of HT.

Methods: This was a retrospective study conducted in a tertiary care hospital over a period of 5 years from June 2019 to June 2024.A total of 45 cases of thyroidectomy specimens were included in the study. All the thyroidectomy specimens which showed only features of Hashimoto thyroiditis on histopathological as the only pathology were included in the study. All the relevant clinical information, radiological findings of thyroid gland, thyroid hormone assay and thyroid autoantibody studies were collected from the clinical records of the patients and analysed statistically.

Result: In our study, most of the cases belonged to the 31-40 years age group. Females were more affected than males. Majority of the patients presented with midline neck swelling and diffuse thyroid enlargement without nodularity. Autoantibody titre showed presence of antithyroglobulin antibodies anti-TPO antibodies in almost all cases .On microscopic examination of the thyroidectomy specimens, the most common finding were hurthle cell change and lymphoid follicles which were present in all cases.

Conclusion: majority of Hashimoto thyroiditis patients run a benign clinical course but in minor percentage of cases there is increased risk of development of malignancies particularly papillary thyroid carcinoma. Close follow up of these patients can lead to early diagnosis and prompt treatment for better management of the patients.

Keywords: Autoantibodies, goitre, Hashimoto thyroiditis, hypothyroidism

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Introduction

The term thyroiditis reflects various group of disorders characterised by thyroid inflammation. Thyroiditis can be classified into acute, subacute and chronic thyroiditis. Chronic thyroiditis include autoimmune thyroiditis (Hashimoto thyroiditis),postpartum thyroiditis, drug induced and iatrogenic thyroiditis. The most common cause of thyroiditis is autoimmune disease. In United states Hashimoto thyroiditis (HT) is the most common cause of hypothyroidism.[1]

Hashimoto thyroiditis also known as chronic autoimmune thyroiditis and chronic lymphocytic thyroiditis is an autoimmune disease in which thyroid cells are destroyed by both cell mediated and antibody mediated processes.[2] HT is the most common cause of hypothyroidism in iodine sufficient areas. It has an incidence of 0.3 -1.5 /1000 per year.[3] Both genetic susceptibility (HLA gene polymorphism and familial aggregation) and environmental factors are responsible for the development of HT.[4,5] Iodine supplementation in iodine deficient areas increases the lymphocytic infiltration of thyroid gland by three fold along with an increase in serum antithyroid antibodies.[6] Clinically these patients present as diffuse or nodular thyroid swelling with or without symptoms. The combined findings of clinical presentation, radiological finding, biochemical assay for autoantibodies, hormonal assay lead the way towards the diagnosis of HT. However the diagnosis of HT is confirmed by histopathological examination of thyroidectomy(partial/total) specimen. During the histopathological evaluation of HT, thyroid neoplasms including papillary thyroid carcinoma (PTC) are detected incidentally. PTC coexisting with HT currently is one of the primary area of research in thyroid pathology .Various studies demonstrated significant association of HT with the prevalence of PTC.[7,8,9] A number of studies also demonstrated that patients with PTC with co-existent HT had better prognosis.[10,11] This study aimed to explore the role of histopathological study along with its correlation with clinical presentation, biochemical and radiological parameters in the diagnosis of HT.

Materials and Methods

This was a retrospective study conducted in a tertiary care hospital over a period of 5 years from June 2019 to June 2024.A total of 45 cases of thyroidectomy specimens were included in the study. All the thyroidectomy specimens which showed only features of Hashimoto thyroiditis on histopathological as the only pathology were included in the study. Patients with coexistent pathology such as thyroid neoplasm along with HT were excluded from this study. All the thyroidectomy specimens after receiving were fixed in 10% formalin solution. After fixation, grossing was done in each case according to the standard protocol and then the grossed tissues were subjected to routine tissue processing method and Haematoxylin and eosin stained slides were prepared and examined under the microscope. All the relevant clinical information, radiological findings of thyroid gland, thyroid hormone assay and thyroid autoantibody studies were collected from the clinical records of the patients. Radiological examination of the thyroid gland included ultrasonography and were represented as TIRADS (Thyroid Imaging Reporting and Data System)score. Thyroid hormone assay i.e. measurement of FT3,FT4 and TSH hormones were done by Electro chemiluminescence immunoassay(ECLIA) method. Anti Thyroglobulin antibody and Anti TPO- antibody were also measured by ECLIA method. Anti TPO value > 34IU/ml and anti Tg> 115IU/ml were considered as positive.

Statistical analysis: All the data were expressed in numbers and percentage. The software version IBM SPSS 2.0 was used for statistical analysis.

Results

A total of 45 cases of HT diagnosed histopathologically were included in the study. In our study, most of the cases belonged to the 31-40 years age group(n=15,33.3%)(Table 1). Females were more affected (n=39,86.6%) than males (06,13.3%)(Table 1). Majority of the patients presented with midline neck swelling and diffuse thyroid enlargement without nodularity accounted to 41(91%) and 37(82.2%) respectively (Table 1). Thyroid ultrasonography showed TIRADS (Thyroid Imaging Reporting and Data Systems) score of 2,3,4 in 29(64%),15(33.4%) and 01(2.2%) cases respectively(Table 2). On biochemical study of thyroid hormone assay 13(28.9%) were euthyroid, 27(60%) showed subclinical hypothyroidism and 05(11.1%) cases showed overt

hypothyroidism(Table 2). Autoantibody titre showed presence of antithyroglobulin antibodies and anti-TPO antibodies in 45(100%) and 34(75.5%) cases respectively(Table 2). On microscopic examination of the thyroidectomy specimens, the most common finding were hurthle cell change and lymphoid follicles which were present in all cases(45,100%) (Table 3).The other less common finding were thyroid follicular atrophy(n=24,53.4%),squamous metaplasia(n=2,4.5%) and stromal fibrosis (n=9,20%) (Table 3)

Table 1: Clinical findings of patients with Hashimoto Thyroiditis n = 45

	Parameters	**Number**	**Percentage(%)**
A	Age(years)		
	21-30	6	13.3
	31-40	15	33.3
	41-50	14	31.1
	51-60	7	15.48
	>60	3	6.6
B	Sex		
	Female	39	86.6
	Male	06	13.3
C	Clinical Parameters		
	Midline neck swelling only	41	91.1
	Both pain and swelling	04	08.8
D	Thyroid enlargement		
	Diffuse thyroid enlargement without nodularity	37	82.2
	Diffuse thyroid enlargement with nodularity	08	17.68

Table 2: Radiological, Biochemical and immunological findings in patients of Hashimoto thyroiditis n= 45

	Parameters	Number	Percentage (%)
A	Radiological Findings (Thyroid USG)		
	TIRADS Score 2	29	64.4
	TIRADS Score 3	15	33.4
	TIRADS Score 4	01	2.2
B	Biochemical findings (Thyroid hormone assay)		
	Euthyroidism (Normal FT4 & TSH)	13	28.8
	Subclinical hypothyroidism FT4-Normal,TSH (4.5 to 10 mu/L)	27	60
	Overt hypothyroidism (FT4-low, TSH>10Mu/L)	05	11.1
C	Immunological findings (Autoantibody study)		
	Antithyroglobulin antibodies	45	100
	Anti-TPO antibodies	34	75.5

Table 3: Microscopic findings of the thyroidectomy specimens in case of HT Patients n = 45

	Microscopic findings	Number	Percentage(%)
1	Thyroid follicular atrophy	24	53.4
2	Hurthle cell change	45	100
3	Squamous metaplasia	02	4.5
4	Lymphoid follicles	45	100
5	Stromal fibrosis	09	20

Discussion

Hashimoto thyroiditis (HT) ID 10:E06 is defined as a prototype of autoimmune disease presenting with goitre, elevated circulating antithyroid antibodies and often with hypothyroidism.[12] HT was first described in 1912 by Dr. Hakaru Hashimoto ,who called it struma lymphomatosa.[13] HT alternatively also known as Hashimoto disease, struma lymphomatosa, chronic lymphocytic thyroiditis, goitrous thyroiditis and lymphadenoid goitre.[12] HT is the most common cause of hypothyroidism in iodine sufficient areas.[14] Histologically it is characterised by infiltration of thyroid parenchyma by mononuclear cells, lymphoid follicles with germinal centres, hurthle cells or oncocytic cells lining residual thyroid follicles and stromal fibrosis.[12]

Various factors are responsible for the development of HT[15] which included genetic susceptibility[Human leucocyte antigen(HLA) ,gene polymorphism] ,environmental factors and production of autoantibodies against thyroglobulin, thyroid peroxidase (TPO) and antithyroid stimulating hormone(TSH) receptor due to breakdown of immune tolerance.[3]

Majority of the patients of HT belongs to the age group of 30-50 years In our study,29 cases out of 45(64.5%) were in the age group of 31-50 years(Table 1) which was similar to previous studies.[16-19]In our study there was a female predominance 39/45(86.6%) similar to various other studies in the past.[11,17,18,20] In the present study, the most common clinical presentation was diffuse painless swelling of the thyroid gland similar to other studies by Pooja et al, LekhaDBS et al[17,20].(Table1)In our study 29 cases out of 45 (64.4%) (Table 2) showed TIRADS score 2 on thyroid USG indicating a benignnodule with 1.5% risk of malignancy. Biochemical studies showed subclinical hypothyroidism in 27(60%) and overt hypothyroidism 05(11.1%) case (Table2) which was contrast to the study by P Caturegli et al[5] which showed majority of the patients (75%) were euthyroid. In the present study anti T4 antibody was found in 100% of the cases similar to the study by Pooja Jain et al.[17] In our study, histopathologic examination of the thyroidectomy specimen(Figure 1a) showed presence of thyroid atrophy(Figure 2b) in 24(53.4%) cases. Lymphoid follicles (Figure 1b) and hurthle cell changes(Figure 2c) were seen in all the cases i.e.45/45 (100%) Stromal fibrosis was seen in 9(20%) cases(Figure 2a).

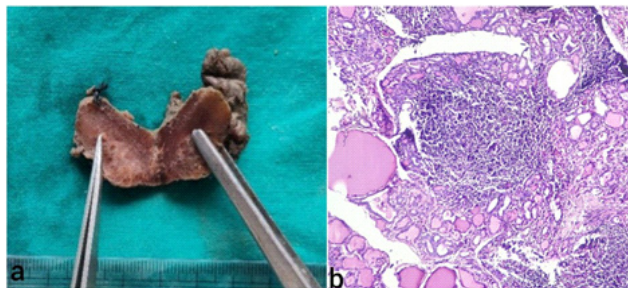

Figure 1 showing gross specimen of thyroid after thyroidectomy(1a) and (1b) showing presence of lymphoid follicles and lymphoplasmacytic infiltrate in the stroma along with thyroid follicles in case of HT(H&E 100X)

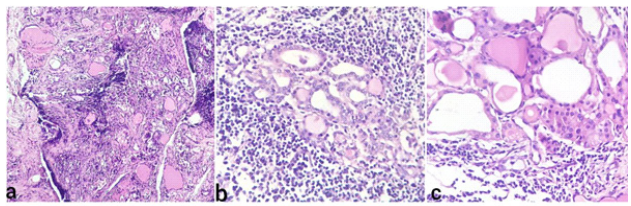

Figure 2 showing stromal fibrosis (2a), atrophied thyroid follicles (2b) and hurthle cells (2c) in case of HT (H&E,400X)

Limitations of the study: Limited sample size is prone to biases of the retrospective analysis. Since the study was conducted in a tertiary care hospital, the cases may not be representative of the general population study.

Future Perspective: Recent advances in molecular technology will likely provide better understanding of the reliability between genetic factors and environmental factors in HT and new therapeutic approaches to HT. Future studies also include areas such as the challenge of differentiating HT and graves disease, the complex link between gut microbacteria and HT onset, and the management of HT alongside complications like pappilary thyroid carcinoma or type 1 diabetes.[21]

Conclusion

Hashimoto thyroiditis is the most common cause of hypothyroidism in iodine sufficient areas. Though majority of the patients run a benign clinical course, in minor percentage of cases there is increased risk of development of malignancies particularly papillary thyroid carcinoma. Close follow up of these patients can lead to early diagnosis and prompt treatment for better management of the patients.

Ethical consideration: Since it is a retrospective study, there were no interaction between researchers and patients. Identity of patients were concealed and confidentiality was maintained. Permission was taken from the department to analysis the data.

Conflicts of interest: None declared

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