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RESEARCH ARTICLE

A Study of the Cytomorphological Spectrum Of Hashimoto Thyroiditis in Coastal India

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Abstract

Hashimoto thyroiditis (HT) is a thyroid specific T-cell mediated autoimmune disease affecting predominantly women. It is the most common cause of hypothyroidism in iodine sufficient areas. Fine needle aspiration cytology of thyroid provides a safe and accurate method for the diagnosis of this condition. **Aim:** To study the cytomorphological features of HT. **Materials and Methods**: Cytomorphological features of 150 cases of HT diagnosed by FNAC at our institute during May 2011-June 2013 were reviewed.
Results: All cases were females, mean age being 38 years. Review of cytological smears showed moderate to high cellularity (87.3%). Most common epithelial cell pattern observed was the macrofollicular/ monolayered sheet pattern. Background of lymphocytes was seen in all the smears. Hurthle cells were present in 82% and lymphocytic infiltrate was seen in 136 cases (90.7%). Lymphoid to epithelial ratio (L:E) was high in 45.8%. Plasma cells were seen in 81% of cases. **Conclusion:** A diagnosis of HT can be made by carefully studying the aspirate smears, hence making FNAC a cost-effective procedure for this condition.

Introduction

Hashimoto thyroiditis (HT) is one of the most common autoimmune diseases causing considerable morbidity in women. It is an organ specific T-cell mediated disease that affects the thyroid (Chistiakov DA, 2005). The incidence of this condition in India seems to be increasing (Marwaha RK, et al, 2000). Fine needle aspiration cytology (FNAC) is highly sensitive in diagnosing HT, with a diagnostic accuracy rate of 92% (Kocjan G, 2006). However the success of this majorly depends on careful examination of the aspirate smears for various cytomorphological features. HT is characterized by Hurthle cell change and increased number of mature and transformed lymphocytes impinging on the follicular cells (Jayaram G, et al, 1987). The present study evaluated the spectrum of cytomorphologic features of HT.

Subjects and Methods

Patients who underwent fine needle aspiration procedure of the thyroid in our institution from May 2011 to June 2013, and diagnosed as HT, were recruited in this study. USG guidance was used for 3 cases. Fine needle

aspiration smears were prepared and stained with May Grunwald Giemsa and Papanicolaou stains. The main qualitative criteria for the diagnosis of HT were the presence of lymphocytes impinging on the follicular cells, or lymphocytes and plasma cells in the background. The cytomorphological features of each case were studied in detail. Lymphoid to epithelial cell ratio (L:E) was calculated as high, equal or low, depending on the relative proportion of cells.

Results

Most of the aspirate smears showed moderate to high cellularity (131, 87.3%). On detailed cytomorphologic study, the most common cell pattern observed in the 150 cases, was the macrofollicular/ monolayered sheet pattern (93, 62%), followed by the dispersed cell pattern (45, 30%). Microfollicular pattern was seen in 7 (4.67%) cases, syncytial fragments in 4 (2.67%) cases and papillary pattern in 1 (0.66%) case. Lymphocytic infiltration was seen in 136 cases (90.7%). Background of lymphocytes was seen in all the cases (100%). Hurthle cells were seen in 123 cases (82%). Anisonucleosis was seen in majority of the cases (139, 92.7%). Lymphoid follicles with germinal centres were noted in 93 cases (62%). Plasma cells were seen in 123 cases (81%). High L:E ratio was seen in 70 cases (46.7%). A minority of cases showed giant cells (10%) and macrophages (8%). A small percentage of cases (14.7%) also showed epithelioid cells. Colloid was scant or absent in 92% of cases, and moderate in 8%. There was one case of HT with associated papillary thyroid carcinoma (PTC). The aspirate in this case was highly cellular, with dominant epithelial population, with follicular cells arranged in papillary clusters. Aspirates revealed characteristic nuclear features of PTC as fine, dusty chromatin, intranuclear cytoplasmic pseudoinclusions and nuclear grooves along with mild nuclear pleomorphism. Lymphocytic infiltration of the follicular cell clusters, along with the background cells comprising of mature and reactive lymphoid cells, indicated preexisting/coexisting HT.

Table 1 : Cytologic features of HT in various studies

Cytologic Feature	**Jayaram G et al[8] (n=88)**	**Singh N et al[9] (n=150)**	**Present Study (n=150)**
Moderate to good cellularity	56.6%	72.7%	87.3%
Hurthle cells	56%	70%	82%
Lymphocytic infiltration	69%	100%	90.7%
Anisonucleosis	44%	45.3%	92.7%
Lymphoid follicles	67%	84.7%	62%
High L:E ratio	38%	75.3%	46.7%
Giant cells	39%	38%	10%
Plasma cells	40%	55.3%	81%
Epithelioid cells	16%	56%	14.7%
Macrophages	-	58%	8%
Fire flares	23%	6.7%	-

Infiltration of epithelial cells by neutrophils and/or eosinophils	17%	14%	-

Discussion

HT is an autoimmune condition characterized by destruction of the thyroid follicles. It is important to diagnose HT as patients subsequently become hypothyroid and require lifelong thyroxine supplementation. Also there is an increased risk of extranodal marginal B cell lymphoma and thyroid carcinoma in patients with HT, which emphasizes the need for long-term follow up. It is also important not to over-diagnose this entity as neoplasms, so that unnecessary surgery can be avoided (Kocjan G, 2006), (Ekambaram M, et al, 2010).

Cellularity was good in majority of our cases, for both ultrasound guided and non guided aspirates. In a study it was found that ultrasound guided aspirates had better cell yield and improved the adequacy of the specimen, when compared to unguided aspirates (Mehrotra P, et al, 2006). But in our experience, cell yield is good in non-guided aspirates as well. This is probably due to the technique of aspiration followed.

On evaluating the cytomorphological features of the cases in the present study, it was found that the most common cell pattern was the macrofollicular/monolayered sheet pattern (62%) followed by dispersed cell pattern (30%). This was in concordance with a study by Bommanahalli et al, 2010. Identification of the predominant cell pattern is complementary to analysis of cell morphology and background details in cytological diagnosis of thyroid lesions.

Cytomorphological features of all the cases were studied in detail. The diagnosis of HT was based on the evidence of inflammatory destruction of the follicular epithelial cells by the lymphoid cells, in association with varying degrees of Hürthle cell change. The findings observed, are compared with previous studies [Table 1].

Anisonucleosis is claimed to be especially useful in distinguishing HT from a Hürthle cell neoplasm (HCN), which paradoxically tends to exhibit a lesser degree of nuclear variability. A highly prominent Hurthle cell component is said to be one of the major diagnostic pitfalls in distinguishing HT from HCN (Nguyen GK, et al,1997). In the present study, Hurthle cells were seen in 82% cases, and 92.7% of them showed anisonucleosis. Furthermore, there was conspicuous lymphoid population in the background which made the diagnosis easy.

L:E ratio is characteristically high in HT, ranging from 2:1 to 10:1.25 High L:E ratio was seen in 46.7% in the present study. This was in concordance with other studies, (Jayaram G, et al, 2007), (Singh N, et al, 2009). An increase in number of epithelial cells should raise the suspicion of epithelial proliferative process associated with HT, like malignancy. One of the cases which had low L:E ratio had coexisting papillary carcinoma.

Detection of plasma cells in the aspirates (81%) was higher in the present study compared to earlier studies (Jayaram G, et al, 2007), (Singh N, et al, 2009). Singh N, et al, stated that the presence of plasma cells is very useful in diagnosing early HT when the lymphocytic infiltration of follicles is insignificant. Infiltration of epithelial cells by neutrophils/eosinophils has been reported in few previous studies (Ekambaram M, et al, 2010), (Jayaram G, et al, 2007), (Singh N, et al, 2009).However this was not seen in any of the cases in the present study. Whether this feature indicates any pathogenetic mechanism is yet to be studied. Epithelioid cells were seen in 14.7% cases. This was comparable with a study by Jayaram G, et al, in 2007.

Absent or scanty colloid is a usual feature of HT, as it is associated with the destruction of follicles in the long run (Singh N, et al, 2009). This was seen in 138 cases (92%) in the present study. Moderate amount of colloid was seen in 8% and no cases were encountered that showed abundant colloid. Significant (moderate and abundant) marginal vacuoles have been described in association with HT in a study by Gupta A, et al, in 2013. However no marginal vacuoles were seen in our study.

Literature reports various neoplastic and non neoplastic lesions in association with HT like colloid goiter, cellular adenoma, follicular neoplasm, Hurthle cell neoplasm, papillary carcinoma, Non-Hodgkins lymphoma (NHL) and follicular carcinoma (Singh N, et al 2009), (Matesa-Anić D, et al, 2009). In the present study, we encountered one case with coexisting papillary thyroid carcinoma (PTC). This was comparable with the study by Singh N, et al in 2009, which had 2 cases of HT with PTC amongst 150 HT cases. Hence a careful search for coexisting neoplasm is important to confirm the complete benign nature of the condition.

Conclusion

FNAC is a cost-effective and specific technique in the evaluation of thyroid lesions. The first step toward making the accurate diagnosis is the adequacy of the aspirates. Correct sampling from lesion, with careful and diligent search for various cytomorphological features can help resolve many pitfalls in diagnosis.

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