Thyroiditis: a Clinico-cytomorphological Study with a Reference to the Ethnic Groups of Northeast Regions of India

Abhijit Kalita¹ · Ronica Baruah¹

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Abstract Definite clinico-cytological criterion is outlined for thyroid lesions. Fine needle aspiration cytology (FNAC) makes it easier to segregate cases of thyroiditis (Chronic lymphocytic thyroiditis/Hashimoto's thyroiditis—CLT/HT, and subacute thyroiditis—SAT) from other benign and malignant lesions of thyroid. The study was done for a period of 5½ years at a diagnostic centre in Guwahati. Patients underwent FNAC and smears were studied for cytomorphology. A correlation with clinical features and thyroid function, including antithyroid antibody estimation, was done, wherever possible. 792 thyroid lesions were encountered during the study, of which 213 (26.89 %) were cases of thyroiditis (70.43 % CLT/HT, 24.9 % SAT and 3.76 % having overlapping features of CLT/HT and SAT); 2 cases (0.9 %) of CLT showed suspicion of Non-Hodgkin's Lymphoma (NHL), which was confirmed on histopathology. 24 cases (11.26 %) belonged to different ethnic tribal groups of Northeast India. CLT/HT presented predominantly with diffuse thyroid enlargement, but 12 cases (8 % of CLT/HT cases) had nodular enlargement. Patients presented with predominantly hypothyroidism; however occasional hyperthyroid cases were also seen. SAT showed signs of inflammation and

presented with hyperthyroidism. Overlap cases of CLT/HT and SAT showed combined clinico-cytomorphological features of both lesions. 37.5 % cases with overlapping features belonged to tribal communities. A rise in incidence of thyroiditis, particularly CLT/HT, was seen. Overlap features of CLT/HT and SAT was noticed in significant percentage. No bias was noticed amongst any specific tribal community. FNAC, coupled with clinico-serological study, helps to diagnose thyroiditis at early stage.

Keywords FNAC ·

Chronic lymphocytic thyroiditis/Hashimoto's thyroiditis · Subacute thyroiditis

Introduction

Thyroiditis is a diverse group of inflammatory disorders of the thyroid, the diagnosis of which is based conventionally on clinical examination, thyroid function test, and anti thyroid antibody estimation—anti-thyroglobulin and anti-thyroid peroxidase antibodies (anti-TG and anti-TPO).

Thyroiditis can be diagnosed with accuracy on FNAC, and does not need a biopsy for confirmation.

Chronic lymphocytic thyroiditis/Hashimoto's thyroiditis and subacute (granulomatous) thyroiditis are the ones which are commonly encountered although overlap of both these conditions are documented [1–3]. As the treatment for these lesions are different, it is important to differentiate one from the other at presentation.

The present study is done to find the incidence of thyroiditis and to correlate its clinico-cytomorphological aspects, with a reference to the ethnic groups of the Northeast regions of India.

✉ Ronica Baruah
ronicanagpal@yahoo.com

Abhijit Kalita
abhighy1985@gmail.com

¹ Ekopath Metropolis Lab Services Pvt. Ltd., First floor, Sikaria Building, Christian Basti, G.S. Road., Guwahati, Assam 781005, India

Materials and Methods

The present study is a retrospective study of 5½ years duration. All cases of FNAC of thyroid gland from January 2009 to June 2014 were compiled. FNAC smears were stained with Papanicolaou and May-Grunewald Giemsa stains and examined under the microscope. Clinical features at the time of FNAC, along with thyroid function tests (estimation of T3, T4 and TSH) and antithyroid antibody estimation, were correlated, wherever possible. The smears which were satisfactory for evaluation according to the Bethesda system for reporting thyroid pathology, were considered under the present study.

Results

A total of 792 thyroid FNACs were encountered during the present study, out of which 213 (26.9 %) were cases of thyroiditis.

Amongst the cases of thyroiditis, Chronic lymphocytic thyroiditis/Hashimoto's thyroiditis (CLT/HT) were the most common (70.43 % of all thyroiditis cases on FNACs). The distribution of the cases of thyroiditis is given in Table 1.

Female preponderance was noticed in the present study with 21–30 year age-group having the maximum number of cases. Moreover, only females showed the overlap features of CLT/HT and SAT (Table 2).

Table 1 Incidence of different types of thyroiditis (n = 213)

Sl No.	Lesion	No. of cases	% of total thyroid FNACs
1	HT/CLT	150	70.43
2	SAT	53	24.9
3	Overlap of CLT/HT and SAT	8	3.76
4	Thyroiditis with Non-Hodgkin's Lymphoma (NHL)	2	0.9

Table 2 Age and sex distribution of thyroiditis

Age group	CLT		SAT		Overlap of CLT and SAT	
	M	F	M	F	M	F
<20	02	08	–	–	–	02
21–30	03	39	01	08	–	02
31–40	04	29	08	10	–	02
41–50	04	30	02	11	–	02
>50	03	30	03	10	–	00

M Male, F Female, CLT/HT includes the two cases of NHL

The maximum number of patients under the present study (138) were Assamese Hindus. The tribal communities (Plains—5, Hills—19) contributed 11.26 % of all the cases of thyroiditis. The distribution of thyroiditis based on the ethnicity is shown in Fig. 1.

Amongst the 24 cases belonging to the ethnic tribal communities, 18 were cases of CLT/HT, 3 cases of SAT and 3 showed overlap features of CLT/HT and SAT (Figure 2).

Discussion

CLT presents with predominantly diffuse thyroid enlargement and features of hypothyroidism, with high levels of TSH. Antithyroid antibodies, particularly TPO, are raised in CLT [4].

Fig. 1 Ethnicity of cases of thyroiditis, n=213

Fig. 2 Distribution of cases in the ethnic groups

The cytomorphology of CLT/HT consists of lymphoid cells in the background, follicular cell degeneration, infiltration of follicles by lymphoid cells, occasional multinucleate cells and the presence of hurthle cell change [5] (Figure 3).

Under the present study, two patients of CLT/HT had lymphoid cells in the background which showed monomorphism (Fig. 4). These two cases were later diagnosed as NHL on histopathology. There is a strong association of Hashimoto's thyroiditis and subsequent development of NHL, as has been described by Kumar et al. [6], Ahmed et al. [7] and Chuengsamarn [8].

SAT presents with hyperthyroidism predominantly and the patient complains of pain, fever, loss of weight with signs of inflammation like raised ESR/CRP, etc. Anithyroid antibodies are negative in these patients.

Fig. 3 **a** Follicular cell degeneration and lymphoid impingement on follicular clusters, **b** Hurthle cell change

Cytomorphology of SAT shows mixed inflammatory cells with follicular cell degeneration and transformation, many epithelioid cells (with granulomas) and multinucleated cells [9] (Fig. 5).

Overlap cases of CLT/HT and SAT is documented in literature [1, 2]. They present mostly with sudden onset hyperthyroidism in patients being treated for hypothyroidism, with complaints of pain & signs of inflammation with raised TPO. Cytomorphology of the overlap cases show large number of multinucleated cells and epithelioid cells in an otherwise background of CLT/HT. As with most other thyroid lesions, female predominance has also been noted in the overlap cases of CLT/HT and SAT.

Under the present study, the incidence of thyroiditis is 26.9 % which is higher than the study of Chandanwale et al. [10] (12.6 %) done in Pune, but comparable with the study of Sood et al. [11] (31.42 %) done in Delhi/Uttar Pradesh.

11.3 % of the total cases under the present study belonged to ethnic tribal communities in the Northeast India. This is a high percentage as the tribal population constitutes 13–14 % of total Northeast population [12]. However, no specific ethnic community showed any predominance, under the present study. Ethnicity also could not be related to overlap cases of CLT/HT and SAT as it comprised just 12.5 % of all cases.

Certain pitfalls were encountered during the present study. The presence of monomorphism in the lymphocytes in CLT cases need to be carefully examined as CLT has increased chances of progressing into NHL. The follicular cells may show severe degree of pleomorphism, in which the cases need to be correlated with clinico-biochemical parameters to rule out malignancy. Hurthle cell neoplasm need to be excluded in cases of severe degree of hurthle cell change.

Fig. 4 Lymphoid population in the background of CLT/HT showing monomorphism

Fig. 5 **a, b** Multinucleated cells and epithelioid cells with follicular cell degeneration

Conclusion

The study can be concluded with the following salient points: Thyroiditis can accurately be diagnosed on FNAC. Incidence of thyroiditis is quite high in the geographical area included under the study. No specific tribal ethnic bias is seen in the tribal communities of Northeast region of India. Overlap cases of CLT and SAT is well documented

in literature and needs careful evaluation under microscopy.

Compliance with Ethical Standards

Conflict of interest No conflict of interest declared by any of the authors.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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