

# Cytomorphological Spectrum of Lymphocytic Thyroiditis: A Cross-Sectional Study from a Tertiary Care Centre

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## Abstract

**Background:** Fine needle aspiration cytology (FNAC) is a safe, minimally invasive, and reliable diagnostic modality for the evaluation of thyroid lesions. Chronic lymphocytic thyroiditis (CLT), including Hashimoto thyroiditis, represents one of the most common benign thyroid disorders encountered on FNAC. Cytological grading of lymphocytic thyroiditis may help in understanding disease severity and activity.

**Objectives:** To study the cytomorphological spectrum of lymphocytic thyroiditis on FNAC, to grade the lesions based on established cytological criteria, and to analyse the association of cytological grades with age and gender.

**Materials and Methods:** This cross-sectional study was conducted in the Department of Pathology, AIIMS Deoghar, from August 2023 to October 2025. A total of 110 thyroid FNAC cases diagnosed as lymphocytic thyroiditis were included. Smears were stained with Giemsa and Papanicolaou stains and independently evaluated by two experienced pathologists. Cytological grading was performed according to the Bhatia et al. grading system (Grades 1–3). Descriptive statistics were used, and associations between grading, age, and gender were analysed using the chi-square test.

### Result:

Of the 110 cases, Grade 1 lymphocytic thyroiditis was the most common (45.5%), followed by Grade 2 (36.4%) and Grade 3 (18.2%). A marked female predominance was observed (95.5%), with a female-to-male ratio of 21:1. Most cases occurred in the 11–35-year age group. No statistically significant association was found between cytological grade and gender ( $p = 0.726$ ) or age group ( $p = 0.561$ ).

**Conclusion:** Lymphocytic thyroiditis shows a wide cytomorphological spectrum with a predominance of low-grade lesions and marked female preponderance. FNAC with cytological grading is a valuable tool for accurate diagnosis and assessment of disease severity, potentially. However, cytological grading does not appear to correlate significantly with age or gender. Further studies incorporating serological and clinical follow-up data are recommended to better elucidate the prognostic significance of cytological grading.

**Keywords:** autoimmune thyroiditis; fine needle aspiration cytology (FNAC); grading; Hashimoto thyroiditis; lymphocytic thyroiditis

## Introduction

Fine needle aspiration cytology (FNAC) of the thyroid is a safe, minimally invasive, and highly accurate diagnostic technique for the evaluation of thyroid disorders[1].

Chronic lymphocytic thyroiditis is the second most common benign diagnosis encountered on thyroid fine needle aspiration cytology (FNAC), following benign follicular nodules, and is also the second most common thyroid lesion diagnosed overall on FNAC after goitre[2].

*Hashimoto thyroiditis* (HT), regarded as a form of chronic lymphocytic thyroiditis (LT), was originally characterized by Hakaru Hashimoto in 1912, marking the first detailed description of this autoimmune thyroid disorder[3]. The cytological grading of Hashimoto's thyroiditis is an important diagnostic criterion, primarily based on the degree of lymphocytic infiltration and the presence of associated cellular alterations such as follicular cell destruction, Hurthle cell change, and germinal center formation[4]. The characteristic cytological features include a background rich in lymphoid cells with infiltration of thyroid follicular epithelial cells by lymphocytes. Additional variable findings may comprise oncocytic cell change, plasma cells, epithelioid cell granulomas, and occasional multinucleated giant cells[5]. Cytological features of lymphocytic thyroiditis typically include a polymorphous population of mature and transformed lymphocytes, abundant oncocytic cells, follicular cells exhibiting fine chromatin and anisonucleosis, as well as epithelioid cell clusters and occasional multinucleated giant cells[3]. Lymphocytic infiltration of thyroid follicles represents a hallmark feature of lymphocytic thyroiditis, and FNAC remains a cornerstone in its diagnosis. However, when graded into mild, moderate, and severe categories, the cytological grades often show poor correlation with clinical, biochemical, ultrasonographic, and radionuclide parameters, as well as serum TMA levels, highlighting the limitations of cytological grading in reflecting functional disease status[1].

While these cytomorphological features are individually well documented, there is a relative paucity of studies evaluating the practical utility of cytological grading in relation to demographic parameters and disease activity.

The present study was designed to grade thyroiditis based on cytomorphological features observed on FNAC smears and to correlate these cytological grades with age and gender. This approach aims to assess the clinical relevance of cytological grading and its potential role in reflecting disease activity and severity.

## Materials and Methods

### Study design and setting

This was a cross sectional study conducted in the Department of Pathology, AIIMS Deoghar, from August 2023 to October 2025.

### Inclusion criteria

All cases of thyroid FNAC diagnosed as lymphocytic thyroiditis or its variants. Adequate smears containing lymphocytes and follicular cells.

### Exclusion criteria

Inadequate or haemorrhagic aspirates. Thyroiditis secondary to other causes (e.g., De Quervain thyroiditis).

### Cytological evaluation

Smears obtained were routinely processed and stained with Giemsa and Papanicolaou (Pap) stains. The stained slides were independently examined by two experienced pathologists under light microscopy. Cytomorphological features were carefully assessed, and grading was performed according to predefined cytological criteria (Table 1). In cases of disagreement, the slides were reviewed jointly, and a consensus grade was assigned to ensure diagnostic accuracy and inter-observer uniformity.

### Statistical analysis

Descriptive statistics were used to determine frequency and percentage. Chi-square test assessed the association between gender and LT occurrence. A p-value <0.05 was considered significant.

## Results

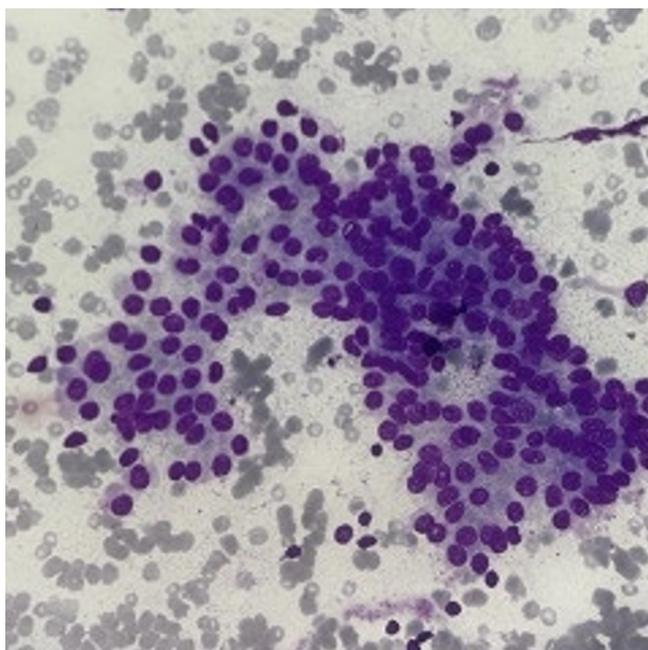
A total of 110 cases of lymphocytic thyroiditis were included in the study, all of which met the inclusion criteria and was graded according. In the present study (Table 2), Grade 1 lesions (Figure 1) constituted the largest proportion of cases (45.5%), followed by Grade 2 (36.4%; Figure 2) and Grade 3 (18.2% ; Figure 3). This distribution indicates a predominance of low- to intermediate-grade lesions, suggesting that a substantial number of cases were identified at a relatively earlier stage.

**Table 1:** Chronic lymphocytic thyroiditis was graded cytologically by the grading system proposed by Bhatia et al.[1].

Grading	Severity	Description
Grade 1	Mild	Few lymphoid cells infiltrating the follicles/increased number of lymphocytes in the background with a few oncocytes cells (follicular-derived epithelial cells with oncocytic cytology).
Grade 2	Moderate	Lymphocytic infiltration or mild lymphocytic infiltration with oncocytes clusters/giant cells/anisonucleosis
Grade 3	Florid	Lymphocytic inflammation with germinal centre formation and very few recognizable follicular cells, oncocytes , on smear

**Table 2:** Distribution of the cases according to grading of lymphocytic thyroiditis.

Grading	Frequency	Percentage (%)
Grade 1	50	45.5
Grade 2	40	36.4
Grade 3	20	18.2
Total	110	100



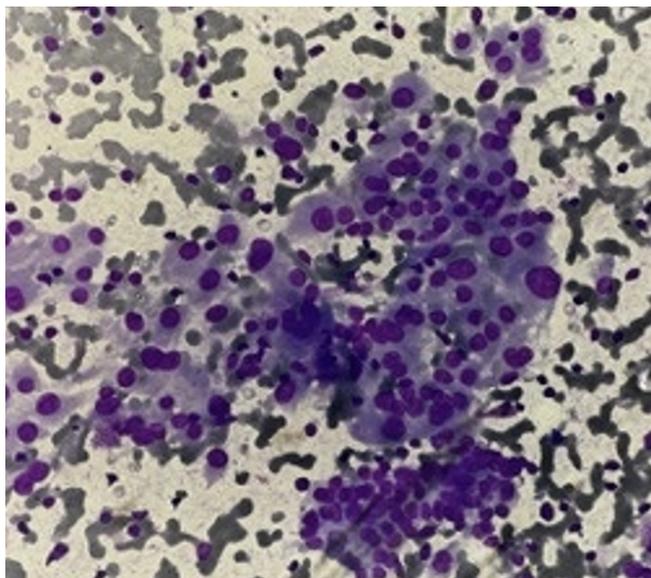
**Figure 1:** Grade 1: Cytological smear shows mild lymphocytic infiltration. (x40, Giemsa stain).

The present study shows a marked female predominance, with females constituting 95.5% of cases, while males accounted for only 4.5% (Table 3). This pronounced gender disparity suggests that the condition predominantly affects females, which may be related to underlying biological, hormonal, or gender-specific risk factors relevant to the disease process.

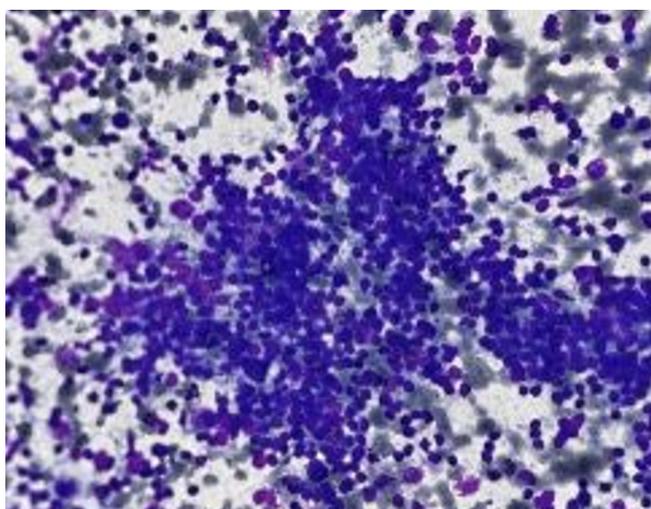
**Table 3:** Case distribution according to gender.

Gender	Frequency	Percentage (%)
Female	105	95.5
Male	05	4.5
Total	110	100

The overall findings highlight the importance of focusing screening, awareness, and preventive strategies primarily on the female population, while acknowledging the need for larger, multicentric studies to better evaluate gender-related differences.



**Figure 2:** Grade 2: Cytological smear shows oncocytes with mild lymphocytic infiltration. (x40, Giemsa stain).



**Figure 3:** Grade 3: Cytological smear shows destruction of thyroid follicular cells by lymphocytes. (x10; Giemsa stain).

Across both sexes (Table 4), Grade 1 lesions were the most frequent (45.5%), followed by Grade 2 (36.4%) and Grade 3 (18.2%). Among females, a similar distribution was observed, with Grade 1 being the most common, whereas males showed a slightly higher proportion of Grade 1 lesions; however, the absolute number of male cases was very small.

**Table 4:** Association of gender with grading of lymphocytic thyroiditis.

Sex	Grade 1	Grade 2	Grade 3	Total	
Female	47 (44.8%)	39	92(37.15%)	19 (18.1%)	105 (100%)
Male	3 (60%)	1 (20%)	1 (20%)	5 (100%)	
Total	50 (45.5%)	40 (36.4%)	20 (18.2%)	110 (100%)	

p=0.726

Statistical analysis revealed no significant association between sex and histological grade (p = 0.726), indicating that the grade distribution was independent of sex in this cohort. This suggests that while the disease shows a marked female predominance, sex does not appear to influence the severity or grading of the lesion.

The age-wise distribution of cases showed that the majority occurred in the 11–35 year age group, followed by the 36–55 year group, with the least number of cases seen in patients older than 56 years (Table 5). Across all age groups, Grade 1 lesions were the most common, followed by Grade 2, while Grade 3 lesions were relatively less frequent. High-grade lesions were observed mainly in the younger and middle age groups, whereas no Grade 3 cases were noted in patients above 56 years.

**Table 5:** Association of age and grading of lymphocytic thyroiditis.

Age group (years)	Grade 1 Number of cases N (%)	Grade 2 Number of cases N (%)	Grade 3 Number of cases N (%)	Total
11-35	26 (47.3)	19 (34.5)	10 (18.2)	55 (100)
36-55	19 (42.2)	16 (35.6)	10 (22.2)	45 (100)
>56	5 (50.0)	5 (50.0)	0 (0.0)	10 (100)
Total	50 (45.5)	40 (36.4)	20 (18.2)	110 (100)

p: 0.561

Statistical analysis demonstrated no significant association between age group and histological grade ( $p = 0.561$ ), indicating that lesion grade was independent of age in the present cohort.

## Discussion

The present study evaluated the distribution of cases with respect to gender, histological grade, and age, and analysed their inter-relationships. A marked female predominance was observed, with females constituting 95.5% of cases. This finding is consistent with most published studies, which report a significantly higher incidence in females. As with Chandanwale SS, the incidence of lymphocytic thyroiditis was common in 2nd to 4th decade of life[5]. In the present study, females far outnumbered males, a finding comparable to the study by Uma *et al.*, who reported a female-to-male ratio of 24.75:1[6]. This finding was also similar to the study by Ishani Gupta *et al.*, who reported a male-to-female ratio of 1:15[7]. It may be likely attributable to gender-specific biological and hormonal factors, as well as greater health-seeking behaviour and screening in women. The small proportion of male cases in the present series it limits meaningful gender-based subgroup analysis. As mentioned by Ashraf *et al* that the cytological grading of Hashimoto's thyroiditis is an important diagnostic criterion, primarily based on the degree of lymphocytic infiltration and the presence of associated cellular alterations such as follicular cell destruction, Hurthle cell change, and germinal center formation. In the present study, all cases diagnosed as Hashimoto's thyroiditis on FNAC were systematically graded using these cytomorphological parameters[4]. Distinguishing HT from papillary thyroid carcinoma and Hurthle cell neoplasms, correlation with disease severity, and its relevance in preventing overtreatment and unnecessary thyroid surgery.

With respect to histological grading, Grade 1 lesions formed the largest group (45.5%), followed by Grade 2 (36.4%) and Grade 3 (18.2%). This observation contrasts with the findings of Uma *et al.*, and Ranjeet Kumar *et al* where Grade II constituted the predominant grade[6, 8]. Comparable results were observed in the study conducted by Anila *et al.*, which demonstrated a predominance of Grade I[3].

The relatively lower proportion of Grade 3 lesions may reflect early detection, improved diagnostic practices, or the natural biological behaviour of the disease in the studied population. These findings are in agreement with previous literature, where low- to intermediate-grade lesions have been reported as the most frequent. Analysis of the association between gender and grade revealed no statistically significant correlation ( $p = 0.726$ ). Although males showed a slightly higher proportion of Grade 1 lesions, the absolute number of male cases was too small to draw definitive conclusions. Other studies have similarly reported no consistent association between sex and histological grade, supporting the observation that gender does not significantly influence disease severity. Age-wise analysis showed that the majority of cases were seen in the 11–35 year age group, followed by the 36–55 year group, with fewer cases in individuals above 56 years. Across all age groups, Grade 1 lesions predominated, while Grade 3 lesions were mainly observed in younger and middle-aged patients and were absent in the >56 year group. However, the association between age and grade was not statistically significant ( $p = 0.561$ ). In studies by Anila *et al.* and Bhat *et al.*, no significant association was found between cytological grading and biochemical parameters such as thyroid function tests[3, 9]. However, the present study focused only on cytological grading, and no data were available regarding its correlation with hormonal assays. Overall, the findings of the present study align well with existing literature, demonstrating female predominance, a higher frequency of low-grade lesions, and no significant association of histological grade with either age or gender. Nevertheless, the relatively small sample size, particularly among males and older age groups, represents a limitation. Lack of serological correlation with anti-thyroid antibodies. No long-term follow-up to assess progression to hypothyroidism.

## Conclusion

Lymphocytic thyroiditis represents a significant portion of thyroid lesions and shows marked female preponderance. FNAC allows accurate diagnosis and staging of LT, preventing unnecessary surgery. Awareness of its cytological variability and common overlapping features with neoplastic lesions is essential for pathologists to avoid diagnostic pitfalls. However, the cytological grades show no statistically significant correlation with age and gender in this study.

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**Competing Interests:** Nil

## References

1. Bhatia A, Rajwanshi A, Dash RJ, Mittal BR, Saxena AK. Lymphocytic thyroiditis – is cytological grading significant? A correlation of grades with clinical, biochemical, ultrasonographic and radionuclide parameters. *CytoJournal*. 2007 Apr 30;4:10.
2. Gupta C, Bhardwaj S, Sharma S. Cytological grading of lymphocytic thyroiditis and its correlation with thyroid hormonal status. *Indian J Pathol Oncol*. 2020 Aug 28;7(3):369–73.
3. Anila K, Nayak N, Jayasree K. Cytomorphologic spectrum of lymphocytic thyroiditis and correlation between cytological grading and biochemical parameters. *J Cytol*. 2016;33(3):145.
4. Ashraf D, Sharma P, Gupta R, Bhardwaj S. Cytological Grading of Lymphocytic Thyroiditis and Its Correlation With Biochemical Parameters: An Experience From a Tertiary Care Center in North India. *Cureus [Internet]*. 2024 Apr 21.
5. Chandanwale SS, Gore CR, Bamanikar SA, Gupta N, Gupta K. Cytomorphologic spectrum of Hashimoto's thyroiditis and its clinical correlation: A retrospective study of 52 patients. *CytoJournal*. 2014 Apr 29;11:9.
6. Uma P, Kartheek B, Himaja S, Lekha J, Babu A, Lakshmi A. Lymphocytic thyroiditis: a correlation of cytological grades with clinical, biochemical and ultrasound findings. *Int J Res Med Sci*. 2013;1(4):523.
7. Gupta I, Kour B, Jandial R, Suri J. Lymphocytic thyroiditis: A correlation between cytological grading and thyroid function tests. *Int J Health Sci*. 2022 Mar 14;6(S1):481–8.
8. Kumar R, Mishra A. A cytomorphological study of lymphocytic thyroiditis and its impact on thyroid hormone regulation. *Int J Pharm Qual Assur*. 2025;16(2). Available from: <https://impactfactor.org/PDF/IJPQA/16/IJPQA,Vol16,Issue2,Article67.pdf>
9. Bhat YM, H.V S, Chettier SS, C.M. M. A Descriptive Study of Cytomorphological Grading of Hashimoto's Thyroiditis and Its Association with Thyroid Hormone Profile in a Tertiary Care Center in Mandya, Karnataka. *J Evid Based Med Healthc*. 2021 Jul 19;8(29):2644–9.