World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

Check for updates

Thyroid Dysfunction in Lichen Disorders: A Cross-Sectional Study of Clinical Associations in a North African Cohort

Yosra Ben Kraiem *, Hyba Taounza, Maha Habibi, Nadia Ismail, Benzekri Laila and Mariame Meziane

Department of Dermatology-Venereology, Ibn Sina University Hospital, Mohammed V University, Rabat, Morocco.

World Journal of Advanced Research and Reviews, 2026, 31(02), 1157–1165

Publication history: Received on 27 June 2026; revised on 03 August 2026; accepted on 05 August 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.31.2.2047

Abstract

Background: Lichen disorders have been linked to thyroid dysfunction, but most studies treat them as a single entity, and data from North African populations with darker phototypes remain limited.

Objective: To evaluate thyroid dysfunction prevalence across clinical subtypes of lichen disorders in a North African cohort.

Methods: A cross-sectional study (retrospective and prospective, February 2023–February 2026) was conducted at CHU Ibn Sina, Rabat, Morocco, including 302 patients with confirmed lichen disorders. Thyroid dysfunction was defined as a previously diagnosed disorder or an abnormal thyroid assessment (TSH, FT4, anti-TPO, anti-Tg). Associations were assessed using Chi-square/Fisher's exact tests and odds ratios (OR).

Results: Mean age was 52 years (IQR: 43–62); 93.7% were female. Frontal fibrosing alopecia (FFA) was the most frequent subtype (42.4%), followed by lichen planus pigmentosus (LPP, 38.4%) and classical lichen planus (23.5%). Thyroid dysfunction occurred in 14.6% of patients: hypothyroidism (10.0%), hyperthyroidism (3.6%), and isolated autoimmune thyroiditis (2.3%). FFA was the only subtype significantly associated with thyroid dysfunction (20.3% vs. 10.3%; $p = 0.024$, OR = 2.2), driven by hyperthyroidism (8.6% vs. 0%; $p < 0.001$). LPP showed a significantly lower hypothyroidism prevalence (4.3%; $p = 0.010$, OR = 0.29). Oral mucosal involvement more than doubled thyroid dysfunction prevalence (27.3%; $p = 0.028$, OR = 2.51).

Conclusion: Thyroid dysfunction is a significant, phenotype-specific comorbidity of lichen disorders. The novel FFA-hyperthyroidism association warrants confirmation in larger prospective studies, and supports systematic thyroid screening, particularly in patients with FFA or oral mucosal involvement.

Keywords: Autoimmunity; Dark phototype; Frontal fibrosing alopecia; Lichen planus pigmentosus; Oral lichen planus; Thyroid dysfunction.

1. Introduction

Lichen planus (LP) is a chronic inflammatory dermatosis characterized by a T-cell-mediated immune response that may affect the skin, mucous membranes, nails, and hair follicles [1, 2]. Beyond its cutaneous manifestations, increasing evidence suggests that LP may be associated with systemic immune-mediated conditions, including autoimmune thyroid disorders [1, 3]. Several clinical variants have been described, such as classical lichen planus (LP), lichen planus pigmentosus (LPP), frontal fibrosing alopecia (FFA), lichen planopilaris (LPPil), and lichen sclerosus (LS), each displaying distinct epidemiological, clinical, and potentially immunological characteristics [4, 5].

* Corresponding author: Yosra Ben Kraiem

The association between lichen disorders and thyroid dysfunction has been reported for several decades, with hypothyroidism, autoimmune thyroiditis, and, less frequently, hyperthyroidism described among affected patients [1, 6]. However, available data remain heterogeneous, and most published studies have evaluated lichen disorders as a single entity rather than analyzing thyroid associations according to specific clinical phenotypes [1]. Consequently, the potential differences in thyroid involvement between lichen variants remain insufficiently characterized.

This issue is particularly relevant for populations with darker phototypes, where the clinical spectrum of lichen disorders differs from that observed in European cohorts. In North African populations, FFA and LPP represent common phenotypes, whereas classical cutaneous lichen planus may be less predominant [4, 7]. Nevertheless, the relationship between these variants and thyroid dysfunction has received limited investigation, and available studies are mainly based on small cohorts [7, 8, 9].

From an immunopathological perspective, the coexistence of lichen disorders and thyroid abnormalities may reflect shared mechanisms involving immune dysregulation, autoimmunity, and genetic susceptibility [3, 6, 10]. Shared HLA allele polymorphisms, CTLA-4 gene variants, and molecular mimicry have been proposed as potential common pathogenic pathways underlying the co-occurrence of lichen and autoimmune thyroid disease in susceptible individuals [3, 6]. However, whether specific lichen variants are associated with distinct thyroid profiles remains unclear.

The aim of this study was therefore to evaluate the prevalence of thyroid dysfunction among patients with lichen disorders in a large North African cohort and to investigate associations between thyroid abnormalities and specific clinical variants. Secondary objectives included assessing thyroid profiles according to disease phenotype and evaluating the relationship between oral mucosal involvement and thyroid dysfunction.

2. Materials and Methods

2.1. Study design and setting

A cross-sectional observational study with retrospective and prospective components was conducted in the Department of Dermatology-Venereology at CHU Ibn Sina, Rabat, Morocco, a tertiary university hospital affiliated with Mohammed V University. The study period extended from February 2023 to February 2026.

2.2. Study population and sampling method

Patients were recruited using a consecutive sampling approach. All adult patients (aged ≥18 years) evaluated in the dermatology department during the study period were screened for eligibility.

Patients were included if they fulfilled the following criteria: (1) age ≥18 years; (2) diagnosis of a lichen disorder established clinically and/or histologically; and (3) availability of sufficient clinical information and thyroid status assessment.

The clinical entities evaluated included FFA, LPP, classical LP, LPPil, and LS. Patients presenting with overlapping clinical phenotypes were included and classified according to each corresponding subtype.

Patients were excluded in cases of incomplete thyroid evaluation or insufficient clinical information preventing accurate classification of the lichen subtype or thyroid status. Patients with a previously diagnosed thyroid disorder were not excluded, as the objective of the study was to evaluate the prevalence and pattern of thyroid abnormalities among patients with lichen disorders rather than to determine the incidence of newly diagnosed thyroid disease.

2.3. Clinical and laboratory assessment

Clinical and demographic data were collected using a standardized case report form based on medical records and clinical evaluation. The collected variables included age, sex, disease duration, clinical subtype of lichen disorder, anatomical distribution and extent of lesions, and the presence and type of mucosal involvement (buccal mucosa, cheilitis, and/or gingival involvement).

Thyroid status was assessed based on available medical history and laboratory investigations. Thyroid dysfunction was defined as either a previously documented thyroid disorder (based on medical records or ongoing thyroid-specific treatment) or an abnormal thyroid evaluation identified during the study period.

Laboratory assessment included serum thyroid-stimulating hormone (TSH), free thyroxine (FT4), anti-thyroid peroxidase antibodies (anti-TPO), and anti-thyroglobulin antibodies (anti-Tg).

Thyroid abnormalities were categorized as follows: hypothyroidism was defined as elevated TSH levels with low or normal FT4 levels; hyperthyroidism was defined as suppressed TSH levels with elevated FT4 levels; and autoimmune thyroiditis was defined as positive anti-TPO and/or anti-Tg antibodies in the absence of overt thyroid hormone abnormalities.

Because detailed information regarding the exact timing of thyroid diagnosis and treatment initiation was not systematically available for all patients, it was not possible to reliably differentiate newly detected thyroid abnormalities from pre-existing thyroid conditions. This limitation was considered when interpreting the results.

2.4. Potential confounding factors

Potential confounding factors considered during interpretation of the results included age, sex, disease duration, clinical subtype of lichen disorder, and the presence of mucosal involvement. These variables were selected because they may influence both the clinical phenotype of lichen disorders and the likelihood of associated thyroid abnormalities.

2.5. Sample size determination

No formal sample size calculation was performed prior to study initiation. The final sample size corresponded to the number of consecutive eligible patients identified during the predefined study period. This approach was chosen due to the exploratory nature of the study and the relative rarity of lichen disorders requiring specialized dermatological assessment in a tertiary care setting.

2.6. Statistical analysis

Statistical analyses were performed using Jamovi software (version 2.6). Continuous variables were summarized as means with interquartile ranges (IQR), while categorical variables were expressed as frequencies and percentages. The distribution of continuous variables was assessed before statistical comparisons.

Associations between thyroid dysfunction and clinical subtypes of lichen disorders were evaluated using the Chi-square test for categorical variables when the assumptions were met. Fisher's exact test was used when expected frequencies were insufficient. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to estimate the strength of associations between clinical characteristics and thyroid abnormalities.

All statistical tests were two-tailed, and a p-value <0.05 was considered statistically significant. Missing data were handled using complete-case analysis, and no data imputation was performed.

3. Results and Discussion

3.1. Demographic and Clinical Characteristics

A total of 302 patients were included in the study. Their demographic and clinical characteristics are summarized in Table 1. The mean age was 52 years (IQR: 43–62 years), and most patients were female (93.7%, n = 283).

FFA was the most frequent clinical subtype (42.4%, n = 128), followed by LPP (38.4%, n = 116) and classical LP (23.5%, n = 71). Lichen sclerosus and lichen planopilaris accounted for 5.6% (n = 17) and 3.6% (n = 11) of the cohort, respectively.

Table 1 Demographic and clinical characteristics of the study population (n = 302)

Characteristic	Value
Age, mean (IQR), years	52 (43–62)
Female sex, n (%)	283 (93.7)
Male sex, n (%)	19 (6.3)
Clinical subtype, n (%)	

Frontal fibrosing alopecia (FFA)	128 (42.4)
Lichen planus pigmentosus (LPP)	116 (38.4)
Classical lichen planus (LP)	71 (23.5)
Lichen sclerosus (LS)	17 (5.6)
Lichen planopilaris (LPPil)	11 (3.6)

Some patients presented with more than one clinical form; percentages therefore do not sum to 100%.

Oral mucosal involvement was observed in 33 patients (11.0%). Among these patients, buccal mucosa involvement was the most frequent manifestation (13 patients, 39.4%), followed by cheilitis (9 patients, 27.3%) and gingival involvement (3 patients, 9.1%). Some patients presented with more than one oral site of involvement (Table 2).

Table 2 Distribution of oral mucosal manifestations among patients with oral mucosal involvement (n = 33)

Oral manifestation	**n**	**%**
Buccal mucosa involvement	13	39.4
Cheilitis	9	27.3
Gingival involvement	3	9.1

Patients could present with more than one oral site of involvement; therefore, percentages are not mutually exclusive.

The marked female predominance observed in our cohort (93.7%) is consistent with the epidemiological profile of lichen disorders and should be considered when interpreting thyroid associations, given the recognized female predominance of autoimmune thyroid disease [1, 6].

3.2. Prevalence of Thyroid Dysfunction

Overall, thyroid dysfunction was identified in 44 patients (14.6%). Hypothyroidism was the most common abnormality (10.0%, n = 30), followed by hyperthyroidism (3.6%, n = 11) and isolated autoimmune thyroiditis, defined by positive thyroid autoantibodies in the absence of overt biochemical thyroid dysfunction (2.3%, n = 7). The distribution of thyroid abnormalities is presented in Table 3.

Table 3 Prevalence and type of thyroid dysfunction in the study population (n = 302)

Category	**n (%)**
Any thyroid dysfunction	44 (14.6)
Hypothyroidism	30 (10.0)
Hyperthyroidism	11 (3.6)
Autoimmune thyroiditis (antibody elevation only)	7 (2.3)

This prevalence appears to be higher than that reported in the general population and is consistent with previous studies suggesting an increased frequency of thyroid abnormalities among patients with lichen disorders [1, 6]. The coexistence of lichen disorders and thyroid abnormalities may be explained by overlapping autoimmune mechanisms. Lichen planus is characterized by a predominantly T-cell-mediated inflammatory response, particularly involving cytotoxic CD8+ lymphocytes targeting basal keratinocytes, in association with genetic susceptibility and environmental triggers [2, 10]. Several immune regulatory pathways have been implicated in both lichen planus and autoimmune thyroid diseases. Genetic variations affecting immune regulation, including CTLA-4 polymorphisms, have been described in multiple autoimmune conditions, suggesting that impaired immune tolerance may contribute to the development of concomitant autoimmune manifestations [3].

3.3. Thyroid Dysfunction According to Clinical Form

The associations between thyroid dysfunction and each clinical subtype are summarized in Table 4.

FFA was the only clinical subtype significantly associated with overall thyroid dysfunction, with a prevalence of 20.3% compared with 10.3% among patients without FFA (χ^2 = 5.887, p = 0.015; OR = 2.21, 95% CI: 1.15–4.23). This association was primarily driven by hyperthyroidism, which occurred in 8.6% of FFA patients and in none of the non-FFA patients (Fisher's exact test, p < 0.001). Because no cases of hyperthyroidism were observed in the non-FFA group, an odds ratio could not be calculated. Hypothyroidism occurred in 11.7% of FFA patients and 8.6% of non-FFA patients, without reaching statistical significance (χ^2 = 0.791, p = 0.374; OR = 1.41, 95% CI: 0.66–2.99).

Overall thyroid dysfunction was not significantly associated with LPP (11.2% vs. 16.7% in non-LPP patients; χ^2 = 1.711, p = 0.191; OR = 0.63, 95% CI: 0.32–1.26). However, patients with LPP had a significantly lower prevalence of hypothyroidism than those without LPP (4.3% vs. 13.4%; χ^2 = 6.657, p = 0.010; OR = 0.29, 95% CI: 0.11–0.78). Conversely, hyperthyroidism was significantly more frequent in LPP patients than in non-LPP patients (6.9% vs. 1.6%; Fisher's exact test, p = 0.025; OR = 4.52, 95% CI: 1.17–17.40).

No statistically significant association was observed between thyroid dysfunction and classical LP, lichen planopilaris, or lichen sclerosus.

Table 4 Association between clinical forms of lichen disorders and thyroid dysfunction (n = 302)

Clinical form	n	Any thyroid dysfunction n (%)	Comparator n (%)	Hypothyroidism n (%)	Hyperthyroidism n (%)	Statistical test	p-value	OR (95 % CI)
Frontal fibrosing alopecia (FFA)	128	26 (20.3)	18/174 (10.3)	15 (11.7)	11 (8.6)	χ^2 = 5.887	0.015 *	2.21 (1.15 – 4.23)
Lichen planus pigmentosus (LPP)	116	13 (11.2)	31/186 (16.7)	5 (4.3)†	8 (6.9)‡	χ^2 = 1.711	0.191	0.63 (0.32 – 1.26)
Classical lichen planus (LP)	71	9 (12.7)	35/231 (15.2)	9 (12.7)	0 (0.0)	χ^2 = 0.267	0.605	0.81 (0.37 – 1.78)
Lichen planopilaris (LPPil)	11	2 (18.2)	42/291 (14.4)	2 (18.2)	0 (0.0)	Fisher's exact	0.666	1.32 (0.28 – 6.31)
Lichen sclerosus (LS)	17	3 (17.6)	41/285 (14.4)	3 (17.6)	0 (0.0)	Fisher's exact	0.722	1.28 (0.35 – 4.63)

FFA, frontal fibrosing alopecia; LPP, lichen planus pigmentosus; LP, classical lichen planus; LPPil, lichen planopilaris; LS, lichen sclerosus; OR, odds ratio; CI, confidence interval.

The Comparator column represents patients without the corresponding clinical subtype (e.g., non-FFA, non-LPP, non-LP, non-LPPil, or non-LS). Odds ratios were calculated by comparing each clinical subtype with its corresponding comparator group. Chi-square tests were used when assumptions were met; otherwise, Fisher's exact test was applied.

*p < 0.05 vs. comparator group. †p = 0.010 vs. non-LPP. ‡p = 0.025 vs. non-LPP. An odds ratio could not be calculated for FFA-associated hyperthyroidism because no cases occurred in the non-FFA group.

The most notable finding of our study was the significant association between FFA and hyperthyroidism, observed in 8.6% of FFA patients compared with none among patients without FFA ($p < 0.001$). Although thyroid abnormalities, particularly hypothyroidism, have been repeatedly reported in patients with FFA, the relationship with hyperthyroidism remains insufficiently characterized. Previous studies have predominantly reported hypothyroidism as the main thyroid abnormality associated with FFA. Valesky et al. identified hypothyroidism in 58% of 12 FFA patients [11], whereas Oulad Ali et al. reported thyroid dysfunction in 23.7% of Moroccan patients without differentiating thyroid subtypes [12]. In larger cohorts, thyroid disease has been reported in approximately 8% to 44.6% of patients with FFA, with hypothyroidism consistently representing the predominant association [4, 5].

Our findings suggest that hyperthyroidism may represent an additional thyroid phenotype associated with FFA, although this observation requires confirmation in independent cohorts. Several biological hypotheses may be considered. Graves' disease, the most common cause of hyperthyroidism, is predominantly associated with a Th2-skewed immune response and thyroid-stimulating hormone receptor autoantibodies, whereas Hashimoto thyroiditis is generally characterized by a Th1-predominant immune profile [13]. FFA predominantly affects postmenopausal women and has also been linked to hormonal changes and immune dysregulation, although the underlying mechanisms remain incompletely understood [14]. Shared autoimmune susceptibility together with hormonal influences may therefore contribute to the coexistence of FFA and thyroid dysfunction in susceptible individuals. However, the cross-sectional design of the present study precludes determination of the temporal relationship between FFA onset and thyroid abnormalities and does not allow causal inference.

Another notable finding was the significantly lower prevalence of hypothyroidism among patients with LPP (4.3%; $p = 0.010$; OR = 0.29). Previous studies have reported variable rates of hypothyroidism in LPP, ranging from 7.6% to 31.7%. Karn et al. identified hypothyroidism in 31.7% of 54 patients [7], Baklouti et al. reported a prevalence of 16.0% in 34 patients [8], Barbri et al. observed a prevalence of 12.5% in 24 patients [9], and Rharib et al. reported 7.6% in a cohort of 65 patients [15]. Collectively, these studies illustrate the marked heterogeneity of thyroid dysfunction reported in LPP across different populations. The relatively low prevalence observed in our cohort may be explained by differences in genetic background, ethnic composition, disease phenotype, or referral patterns. Because LPP is particularly prevalent in individuals with darker phototypes, specific immunological pathways may differ from those involved in other lichen variants or autoimmune thyroid diseases. Nevertheless, this finding should be interpreted cautiously, as subgroup distributions may have been influenced by sample characteristics, pre-existing thyroid disorders, or other unmeasured confounding factors. Prospective studies with standardized endocrine evaluation are needed to confirm this observation.

3.4. Oral Mucosal Involvement and Thyroid Dysfunction

The association between oral mucosal involvement and thyroid dysfunction is presented in Table 5.

Patients with oral mucosal involvement had a significantly higher prevalence of thyroid dysfunction than those without oral involvement (27.3% vs. 13.0%; $\chi^2 = 4.803$, $p = 0.028$; OR = 2.51, 95% CI: 1.08–5.83). Although hypothyroidism was more frequent in patients with oral mucosal involvement (15.2% vs. 9.3%), this difference was not statistically significant ($\chi^2 = 1.127$, $p = 0.288$). In contrast, hyperthyroidism was significantly more prevalent among patients with oral mucosal involvement (12.1% vs. 2.6%; Fisher's exact test, $p = 0.023$; OR = 5.16, 95% CI: 1.43–18.70).

Table 5 Association between oral mucosal involvement and thyroid dysfunction

Variable	Oral mucosal involvement (n = 33) n (%)	No oral mucosal involvement (n = 269) n (%)	Statistical test	p-value	OR (95% CI)
Any thyroid dysfunction	9 (27.3)	35 (13.0)	$\chi^2 = 4.803$	0.028*	2.51 (1.08–5.83)
Hypothyroidism	5 (15.2)	25 (9.3)	$\chi^2 = 1.127$	0.288	1.74 (0.62–4.92)
Hyperthyroidism	4 (12.1)	7 (2.6)	Fisher's exact	0.023*	5.16 (1.43–18.70)

Fisher's exact test was used when expected cell counts were <5. *p < 0.05.

This finding is in agreement with previous studies linking oral lichen planus (OLP) and autoimmune thyroid disease. Recent Mendelian randomization analyses have suggested shared genetic susceptibility between autoimmune thyroid disease and OLP, including the involvement of the PTPN22 gene [16]. Clinical studies have also demonstrated increased frequencies of Hashimoto thyroiditis and thyroid autoantibody positivity among patients with OLP, particularly in erosive forms [17]. A recent narrative review summarized the available evidence supporting an increased prevalence of hypothyroidism among patients with OLP, with several individual studies reporting odds ratios approaching 3 [1]. Furthermore, a systematic review and meta-analysis by De Porras-Carrique et al. confirmed an increased prevalence of autoimmune diseases among patients with OLP, including both hypothyroidism and hyperthyroidism [18]. Similarly, Piloni et al. demonstrated a significant association between OLP and thyroid disorders in an Italian cohort [19]. Our findings extend these observations to a North African population, which remains underrepresented in studies investigating the relationship between lichen disorders and thyroid dysfunction.

Strengths and Limitations

Several limitations should be acknowledged. First, the monocentric design and hospital-based recruitment may have introduced selection bias, as patients managed in a tertiary dermatology center may not fully represent the broader population of individuals with lichen disorders. Second, the absence of a control group precluded direct estimation of the relative risk of thyroid dysfunction compared with the general population. Third, the cross-sectional design limits interpretation of temporal relationships and prevents conclusions regarding causality. Detailed information regarding thyroid treatment and the chronology of thyroid diagnosis was not systematically available for all patients; therefore, previously treated thyroid disorders could not always be distinguished from newly identified abnormalities, which may have influenced prevalence estimates and subgroup comparisons. In addition, the limited number of patients in certain subgroups, particularly those with lichen planopilaris and lichen sclerosus, reduced statistical power and precluded robust subgroup analyses. Finally, the coexistence of multiple lichen variants in some patients may have complicated attribution of thyroid abnormalities to a single clinical phenotype.

Despite these limitations, this study has several strengths. To our knowledge, it represents one of the largest North African cohorts evaluating thyroid dysfunction across multiple lichen phenotypes. The standardized thyroid assessment, including both thyroid function tests and thyroid autoantibodies, provided a comprehensive evaluation of thyroid status. Moreover, stratification according to clinical subtype yielded additional insight into phenotype-specific associations, particularly regarding FFA, LPP, and oral mucosal involvement. These findings contribute to a better understanding of the complex relationship between lichen disorders and thyroid dysfunction and provide a rationale for future multicenter prospective studies designed to clarify the underlying pathogenic mechanisms.

4. Conclusion

This study, conducted in a cohort of 302 patients with lichen disorders from North Africa, highlights the frequent coexistence of thyroid dysfunction within this group, with an overall prevalence of 14.6% and variable patterns according to clinical phenotype. The association between thyroid abnormalities and lichen disorders does not appear to be uniform across all variants. In particular, FFA showed a significant association with thyroid dysfunction, mainly driven by hyperthyroidism, an observation that requires confirmation in independent cohorts. Conversely, the lower prevalence of hypothyroidism observed in patients with LPP raises the possibility of phenotype-specific differences in immune dysregulation.

Oral mucosal involvement was also associated with a higher frequency of thyroid dysfunction, supporting the potential value of considering thyroid evaluation in selected patients with lichen disorders, particularly those presenting with FFA or mucosal disease. However, given the cross-sectional design of this study, these findings should be interpreted as associations rather than evidence of causality.

Further multicenter prospective studies, including populations with diverse phototypes and incorporating longitudinal assessment of thyroid status, are needed to confirm these phenotype-specific associations, better characterize the underlying immunological mechanisms, and determine whether thyroid disease may influence the clinical course and management of lichen disorders.

Compliance with ethical standards

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. No additional acknowledgements are declared.

Disclosure of conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. No financial support was received from any organization for the submitted work, and none of the authors have financial relationships, at present or within the previous three years, with any organization that might have an interest in the submitted work.

Statement of ethical approval

This study was conducted in accordance with the principles of the Declaration of Helsinki. It involved the retrospective and prospective analysis of clinical and laboratory data collected during routine patient care in the Department of Dermatology-Venereology at CHU Ibn Sina, Rabat, Morocco, without any additional diagnostic or therapeutic intervention beyond standard clinical practice.

No formal Institutional Review Board (IRB) approval number was available for this study, as no dedicated research ethics committee approval process was established at our institution for this type of non-interventional observational study at the time of data collection.

Statement of informed consent

All collected data were anonymized before analysis, and patient confidentiality was strictly maintained throughout. For patients included in the prospective component of the study, information regarding the use of their clinical and biological data for research purposes was provided in accordance with departmental practice.

This study did not involve any animal subjects.

References

[1] Radu AM, Carsote M, Nistor C. Crossroads between skin and endocrine glands: the interplay of lichen planus with thyroid anomalies. Biomedicines. 2023;12(1):77. doi:10.3390/biomedicines12010077

[2] Odell H, Jerkovic Gulin S, Seifert O. Comorbidity in lichen planus: a retrospective population-based case-control study in Sweden. Life (Basel). 2026;16(4):541. doi:10.3390/life16040541

[3] Carlucci P, Spataro F, Cristallo M. Immune-molecular link between thyroid and skin autoimmune diseases: a narrative review. J Clin Med. 2024;13(18):5594. doi:10.3390/jcm13185594

[4] Vañó-Galván S, Molina-Ruiz AM, Serrano-Falcón C. Frontal fibrosing alopecia: a multicenter review of 355 patients. J Am Acad Dermatol. 2014;70(4):670-678. doi:10.1016/j.jaad.2013.12.003

[5] Baba PUF. Frontal fibrosing alopecia. Sage Open Med Case Rep. 2025;1(1):90-99. doi:10.1177/30499240251320926

[6] Guarneri F, Giuffrida R, Di Bari F. Thyroid autoimmunity and lichen. Front Immunol. 2017;8:146. doi:10.3389/fendo.2017.00146

[7] Karn D, Kc S, Timalsina M. Lichen planus pigmentosus: a study for association of thyroid dysfunction. Kathmandu Univ Med J. 2016;14(53):36-40.

[8] Baklouti M, Sellami K, Rekik M. Lichen plan pigmentène: profil épidémiologique et morphologique en Tunisie. Ann Dermatol Venereol. 2021;1(8):A337. doi:10.1016/j.fander.2021.09.402

[9] Barbri A, Hali F, Chiheb S. Association lichen plan pigmentène et dysthyroïdie: étude prospective 24 cas. Ann Dermatol Venereol. 2023;3:A327. doi:10.1016/j.fander.2023.09.566

[10] Vičić M, Hlača N, Kaštelan M. Comprehensive insight into lichen planus immunopathogenesis. Int J Mol Sci. 2023;24(3):3038. doi:10.3390/ijms24033038

[11] Valesky EM, Maier MD, Kaufmann R, et al. Single-center analysis of patients with frontal fibrosing alopecia: evidence for hypothyroidism and a good quality of life. J Int Med Res. 2018;47(2):653-661. doi:10.1177/0300060518807335

[12] Oulad Ali S, Belcadi J, El Hilali S. Frontal fibrosing alopecia and comorbidities in a Moroccan population. JAAD. 2023;18:12:37-38. doi:10.1016/j.jdin.2023.04.003

[13] Vargas-Uricoechea H. Molecular mechanisms in autoimmune thyroid disease. Cells. 2023;12(6):918. doi:10.3390/cells12060918

[14] Roman AM, Petca RC, Dumitrașcu MC. Frontal fibrosing alopecia and reproductive health: assessing the role of sex hormones in disease development. J Pers Med. 2024;14(1):72. doi:10.3390/jpm14010072

[15] Rharib K, Bendaoud L, Aboudourib M. Pigmentogenic lichen planus: epidemioclinical profile and pathological associations. World J Adv Res Rev. 2025;25(2):1878-1881. doi:10.30574/wjarr.2025.25.2.0472

[16] Ni J, Ye X, Chen Y. Association between autoimmune thyroid disease and oral lichen planus: a multi-omic genetic analysis. Int Dent J. 2025;75(3):2194-2203. doi:10.1016/j.identj.2024.12.014

[17] Zhang T, Hou F, Liu D. Association of Hashimoto's thyroiditis and anti-thyroid antibodies with oral lichen planus: a cross-sectional study. Front Immunol. 2022;13:967988. doi:10.3389/fimmu.2022.967988

[18] De Porras-Carrique T, Ramos-García P, Aguilar-Diosdado M. Autoimmune disorders in oral lichen planus: a systematic review and meta-analysis. Front Immunol. 2023;29(4):1382-1394. doi:10.1111/odi.14127

[19] Piloni S, Ferragina F, Barca I. The correlation between oral lichen planus and thyroid pathologies: a retrospective study in a sample of Italian population. Eur J Dent. 2024;18(2):510-516. doi:10.1055/s-0043-1772247