
Association of lichen planopilaris with thyroid disease: A retrospective case-control study

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Background: Studies on the precise causes and comorbidities seen with lichen planopilaris (LPP) are limited.

Objective: We sought to determine the prevalence of thyroid diseases in patients with LPP.

Methods: Medical records of 166 patients with LPP and 81 age- and gender-matched control subjects seen in the Department of Dermatology at the Cleveland Clinic Foundation in Ohio between 2000 and 2013 were reviewed.

Results: A diagnosis of thyroid disease was present in 34% (n = 57) of the 166 patients with LPP, and in 11% (n = 9) of the control subjects ($P = .0001$). When confined to hypothyroidism only, this disease was found in 29% (n = 48) of the patients with LPP and 9% (n = 7) of the control subjects ($P = .0003$).

Limitations: This study was limited by being retrospective.

Conclusion: In our patients, LPP was associated with thyroid disease, especially hypothyroidism. (J Am Acad Dermatol 2014;70:889-92.)

Key words: alopecia; cicatricial alopecia; hypothyroidism; lichen planopilaris; thyroid disease; thyroiditis.

Lichen planopilaris (LPP) is a rare lymphocytic-mediated condition that selectively targets hair follicles, leading to inflammation and scarring.¹ LPP is classified as a primary cicatricial alopecia with unknown origin and comorbidities. Many studies have mentioned that LPP has an autoimmune pathogenesis, but no clear association between LPP and autoimmune diseases exists.

According to the American College of Physicians, about 11 million Americans have hypothyroidism, particularly women older than 50 years.² About 4.6% of the US population age 12 years and older has hypothyroidism.³ Lack of thyroid hormone has been associated with decreased hair bulb cell proliferation and decreased mean hair diameter.^{4,5} Infants with congenital hypothyroidism display diffuse hair loss.⁶ Adults with hypothyroidism can have associated

high telogen hair counts on the scalp.⁷ Although there is an effect of thyroid disease on hair growth, there is no known association with scarring alopecic processes, such as LPP.

In our clinical experience, we have observed that patients with LPP often have a diagnosis of thyroid disease, in particular hypothyroidism.⁸ A careful review of literature did not reveal any studies that specifically address the prevalence of thyroid disease in patients with LPP. In contrast to our findings, a published study on therapeutic outcomes identified only 1 of 30 patients with LPP and autoimmune thyroid condition.⁹ Therefore, we initiated this study with an aim to examine the prevalence of thyroid disease in patients given the diagnosis of LPP from the Cleveland Clinic alopecia registry in Ohio.

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METHODS

This is a retrospective case-control study of patient medical records approved by the Cleveland Clinic Foundation Institutional Review Board (No. 10-160). Patients' medical records were obtained via the Cleveland Clinic Foundation patient medical record database. All patients were evaluated in the Cleveland Clinic Department of Dermatology. We reviewed the medical records of 166 patients with LPP and 81 age- and gender-matched control subjects seen in our dermatology clinic between 2000 and 2013. Demographic factors, such as age, gender, and race, were recorded. The presence of thyroid disease at the time of their hair loss evaluation period was recorded. Incidence of diabetes and hyperlipidemia was recorded in all study

patients. The onset of LPP in relation to the diagnosis of a thyroid condition was established. The search criterion for the study group was "lichen planopilaris," and the criteria for the primary outcomes were: (1) "hypothyroidism not otherwise specified," (2) "thyroid nodule," (3) "goiter," (4) "hyperthyroidism," and (5) "abnormal thyroid function." The diagnosis of LPP was based on clinical features, including absence of follicular ostia, perifollicular erythema, and perifollicular scale. A scalp biopsy specimen was used to confirm the diagnosis of a scarring alopecia LPP. The control subjects in this study were identified from a patient population with diagnosis of seborrheic dermatitis and no clinical evidence of alopecia.

Study data were collected and managed using REDCap (Research Electronic Data Capture) tools, a secure, World Wide Web-based application.¹⁰ Statistical relationships between these study groups and associated factors were tested using χ^2 , Fisher exact, and 2-sample *t* tests, as appropriate. Because of the discrete nature of the response variable, Pearson χ^2 test was used to compare prevalence of thyroid conditions. In the cases in which the counts were too small for that test, Fisher exact test was used. All tests were conducted at a significance level of *P* less than .05 using JMP statistical software.¹¹

RESULTS

The medical records of 166 patients with LPP were reviewed (Table I) and their findings were compared

with age- and gender-matched control patients. Thyroid disease was found in 34% (*n* = 57) of patients with LPP (*P* value = .0001) and in 11% (*n* = 9) of the control subjects. In particular, hypothyroid conditions were present in 29% (*n* = 48) of patients with LPP (*P* value = .0003), and only 9% (*n* = 7) of the control subjects (Table II).

All hypothyroid conditions were found to be significantly higher in the LPP group than in the control group. The majority of patients with hypothyroid LPP had a pre-existing diagnosis of a hypothyroid disease (*n* = 41, 85%). On the other hand, LPP was diagnosed before hypothyroidism in 15% (*n* = 7) of patients with hypothyroid LPP. Other thyroid diseases in patients with LPP were found to have no statistical significance, including goiter, thy-

roid nodules (single and multiple nodules), hyperthyroid disease, and chronic lymphocytic thyroiditis. In addition, 1 patient with LPP had a fatty thyroid tumor. No reports of malignant thyroid disease were present in our LPP study or control group. The incidence of hyperlipidemia and diabetes were noncontributory to the increased prevalence of thyroid disease in patients with LPP.

DISCUSSION

We report a significant association between LPP and thyroid gland disease. Although the correlation between hypothyroidism and nonscarring alopecia is well known, a similar prevalence in scarring alopecic disease has not been established. While retrospective studies have suggested the association of thyroid disease with LPP, we demonstrates the findings in a focused and controlled approach.^{7,12,13}

Compatible with previous studies, the majority of the patients with LPP in our study are white women with mean age of 55.1 years (range 18-90 years). Our control population was successfully matched, with prevalence of thyroid conditions reflective of the general population. The presence of comorbidities such as diabetes and hyperlipidemia did not appear to be confounding factors in the rates of hypothyroidism.

A recently published study of another lichenoid disorder, oral lichen planus, demonstrated a similar association with hypothyroidism.¹⁴ Whether the same pathogenesis is involved in these two lichenoid

CAPSULE SUMMARY

- The association between lichen planopilaris and thyroid disease has not been previously described.
- In our patients, lichen planopilaris was strongly associated with thyroid disease, particularly hypothyroidism.
- The diagnosis of lichen planopilaris should prompt the clinician to evaluate the patient for symptoms of hypothyroidism.

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