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ORIGINAL RESEARCH

Lichen Planus: A Cross-Sectional Evaluation of US Dermatologists' Comorbidity Screening and Management Patterns

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ABSTRACT

***Introduction*:** Lichen planus (LP) is a chronic inflammatory dermatosis affecting up to 0.91% of the US's population. LP is associated with various comorbid conditions, among them autoimmune conditions. LP has various treatment strategies, although none are US Food and Drug Administration (FDA)-approved; this is further complicated by the lack of any clinical or expert guidelines. This study aimed to explore dermatology practitioners' comorbidity screening patterns and treatment practices for management of LP.

***Methods*:** An institutional review board (IRB)-approved, anonymous survey was distributed to members of the ODAC Conference listserv, targeting dermatology practitioners. The survey collected data on demographics, comorbidity screening, and treatment strategies.

***Results*:** A total of 406 respondents (17.4% response rate) participated. Hepatitis C virus was the most screened for condition (91.0%), despite its overall low prevalence in patients with LP. Screening rates for highly prevalent comorbidities such as hypertension (10.1%), dyslipidemia (9.7%), depression (18.7%), and anxiety (17.3%) were low. Importantly, almost one-third (32.5%) of respondents reported performing no screening for any comorbid conditions. Topical corticosteroids were the most prescribed therapy (97.8%), followed by topical calcineurin inhibitors (67.7%) and intralesional corticosteroids (64.8%), consistent with high-level evidence for their use in LP treatment. Phototherapy and systemic treatments, including oral immunosuppressants and retinoids, were less frequently utilized despite strong evidence supporting their use.

***Conclusion*:** These data highlight gaps in the comorbidity screening practices among dermatology practitioners managing LP, with significant underscreening for prevalent conditions. While respondents commonly relied on some evidence-based topical treatments, there is notable underutilization of systemic treatments for moderate to severe disease. These results emphasize the need for clinical guidelines for LP management, aiming to enhance patient care and outcomes.

Keywords: Lichen planus; Comorbidity; Screening; Treatment; Guidelines

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Key Summary Points

This survey of US dermatologists reveals inconsistent screening for lichen planus comorbidities, with frequent testing for hepatitis C but underrecognition of common comorbidities such as hypertension, depression, and anxiety.

While many dermatologists utilize popular lichen planus treatments, they underuse some efficacious, evidence-backed treatment options.

Many dermatologists are unaware that no FDA-approved treatments currently exist for lichen planus, reflecting a need for improved awareness and education.

Variability in screening and treatment practices—often influenced by training level and practice setting—highlights the need for evidence-based clinical guidelines to support consistent and effective lichen planus management.

INTRODUCTION

Lichen planus (LP) is a chronic inflammatory dermatosis affecting the skin and mucous membranes. LP presents heterogeneously, involving cutaneous, mucosal, and appendageal structures [1, 2]. LP affects an estimated 0.39% of the total US population and 0.91% of individuals ages 75 and older [3, 4]. Of all patients presenting to dermatology clinics, 1.5% are diagnosed with LP [2]. Proposed etiologies of LP involve dysregulated immunity, genetic predisposition, exposure to medications and infections, and psychological stressors [1, 2].

In line with other chronic inflammatory skin diseases, there is a growing list of comorbid medical conditions associated with LP [1]. These include hepatitis C virus (HCV), hypertension (HTN), dyslipidemia, malignancy, type I and type II diabetes mellitus (DM), thyroid disorders (TD), malignancy, depression, anxiety, alopecia areata, inflammatory bowel disease (IBD), systemic lupus erythematosus (SLE), and lichen sclerosus [5–10]. Prevalence rates vary by comorbid condition, though HTN, depression, and anxiety are found in as many as 50% of cases [5, 7]. Despite these comorbidities being common, no recommendations are currently available in the US to guide screening in patients with LP.

The heterogeneous presentations of LP can be treated with various modalities, comprised broadly of topical anti-inflammatory agents, systemic immunosuppressive agents, and phototherapy. There are no US Food and Drug Administration (FDA)-approved treatments currently available for LP, and the efficacy of current off-label treatment options is supported by varying levels of evidence. Treatment choices and the course of management remain at the discretion of clinicians without clear first-line and subsequent treatment escalation recommendations [4, 11].

Given the range of LP-associated comorbidities and the diverse therapeutic strategies available, this survey aimed to evaluate current clinical practices among US dermatology practitioners in the management of LP, with a focus on comorbidity screening patterns and treatment approaches. Armed with knowledge of key gaps in practice, this study may inform the development of evidence-based recommendations to support consistent, effective care for patients with LP.

METHODS

An anonymous and voluntary survey was disseminated to the ODAC Dermatology, Aesthetics & Surgical Conference listserv. Listserv members include US dermatology practitioners ≥ 18 years old. Instructions indicated that respondents should complete the survey independently. Study data were collected and managed using SurveyMonkey, a secure online survey platform. Responses were incentivized with gift cards distributed to the first 200 participants.

The survey included 15 questions, including demographics, comorbidity screening practices, and treatment practices. Statistical analyses of comorbidity screening, treatment patterns,

and FDA-approval of treatments across levels of training, age groups, and practice types were conducted using chi-square tests. Quantitative evaluations of comorbidity screening and treatment patterns were performed using *t* tests and/or one-way analysis of variance (ANOVA).

This study received institutional review board approval from The George Washington University (IRB#: NCR224226). The study was conducted in full compliance with the Helsinki Declaration of 1964 and its subsequent amendments. Informed consent was obtained from all study participants, and consent for publication of any identifying information has been secured from all participants involved in this study. STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) guidelines were utilized to ensure accurate and complete reporting of this observational study [12].

RESULTS

Respondent Characteristics

The survey was distributed to 2340 dermatology practitioners and a total of 406 respondents completed the survey (17.4% response rate). Respondents' ages ranged from 20 to 60+ years old, with a majority of respondents between 30 and 39 years old (51.2%). Respondents included attending physicians (42.4%), resident physicians (40.6%), physician assistants (PAs) (12.6%), and nurse practitioners (3.0%). Most respondents practiced in a group practice (36.0%) or an academic institution/Veterans Affairs (35.2%) (Table 1).

Respondents treated an average of 2.48 new (SD ± 0.85) and 2.66 follow-up (SD ± 0.87) patients with LP monthly. Respondents most commonly saw patients with cutaneous LP, followed by oral, genital, and nail LP, with cases most commonly being of mild-to-moderate severity (64.9%) (Table 2, Fig. 1).

Screening Patterns

Overall 67.5% of respondents reported screening patients with LP for comorbidities and screened for an average of 5.12 conditions (SD ± 4.29). Among respondents who performed screening, the majority screened for HCV (91.0%), followed by hepatitis B virus (HBV) (52.9%), and DM (33.5%). Among those who do screen, less than a third do so for TD (30.6%), human immunodeficiency virus (HIV) (30.2%), depression (18.7%), anxiety (17.3%), malignancy (16.9%), HTN (10.1%), and dyslipidemia (9.7%). SLE (20.1%) was the most common autoimmune condition screened for, followed by rheumatoid arthritis (RA) (12.6%), IBD (11.9%), and celiac disease (3.6%) (Fig. 2).

Table 1 Survey respondent demographics

	Number	Percent
Age		
20–29	56	13.8%
30–39	208	51.2%
40–49	56	13.8%
50–59	48	11.8%
60+	33	8.1%
Prefer not to say	5	1.2%
Level of specialization		
Resident physician	165	40.6%
Attending physician	172	42.4%
Physician assistant	51	12.6%
Nurse practitioner	12	3.0%
Other	6	1.5%
Practice setting		
Solo practice	49	12.1%
Group practice	146	36.0%
Academic institution/Veterans Affairs	143	35.2%
Community hospital/multispecialty clinic	36	8.9%
Health maintenance organization	20	4.9%
Not applicable	8	2.0%
Other	4	1.0%

Table 2 Lichen planus patient load and severity managed by respondents

	Number	Percent
New patients with LP/month		
0	27	6.7%
1–2	215	53.0%
3–5	117	28.8%
6–10	36	8.9%
10+	11	2.7%
Follow-up patients with LP/month		
0	18	4.4%
1–2	178	43.8%
3–5	148	36.5%
6–10	48	11.8%
10+	14	3.5%
Severity of patients with LP		
Mild	52	12.8%
Mild to moderate	263	64.8%
Moderate to severe	71	17.5%
Severe	17	4.2%
Does not apply	3	0.7%

Only one respondent reported screening for lichen sclerosus.

Upon further analysis, 20.8% of respondents only screened for HCV, and while infrequent, the most common combination screening panels were HCV and HBV (12.59%); HCV, HBV, SLE, RA, IBD, depression, and anxiety (5.40%); HCV, HBV, and HIV (3.60%); and HCV and HIV (3.24%).

The decision to screen for comorbidities of LP was associated with a respondent's level of training ($p < 0.01$); attending physicians were more likely to perform screening than resident physicians and PAs. Comorbidity screening was not associated with a practitioner's age ($p = 0.4793$) nor practice type ($p = 0.1205$).

Treatment Patterns

The most commonly prescribed treatments were topical corticosteroids (TCSs) (97.8%), topical calcineurin inhibitors (TCIs) (67.7%), intralesional corticosteroids (ILCSs) (64.8%), followed by oral immunosuppressants (OIs) (50.6%), narrowband UVB (nbUVB) (40.7%), and topical vitamin D analogues (TVDAs) (33.3%). Among the 252 respondents who prescribe OIs, methotrexate was the most used (89.7%), followed by mycophenolate mofetil (50.8%), cyclosporine (41.3%), and azathioprine (30.6%). Monoclonal antibodies (mAbs) were prescribed by 14.4% of respondents with anti-tumor necrosis factor (TNF) agents as the most common ($n = 92$, 84.4%), followed by anti-interleukin (IL)-17 ($n = 65$, 59.6%), anti-IL-23 ($n = 64$, 58.7%), and anti-IL-12/23 ($n = 51$, 46.8%) agents. Additional treatments are detailed in Fig. 3.

Treatment choices were significantly associated with the age, level of training, and practice type of respondents ($p < 0.01$). Younger respondents (ages 20–39) were more likely to prescribe TCIs and IMCSs, while older respondents (ages 40–60+) favored TVDAs, topical retinoids, oral retinoids, ILCSs, mAbs, and Janus kinase inhibitors (JAKis) ($p < 0.05$). Resident physicians prescribed TVDAs, topical retinoids, and mAbs more frequently than attending physicians and PAs ($p < 0.05$), while both resident and attending physicians were more likely to prescribe TCSs and systemic therapies (isotretinoin, acitretin, OIs, nbUVB) compared to PAs ($p < 0.05$). Use of TCIs was higher in group practices and academic institutions/VAs, while TVDAs, topical retinoids, and isotretinoin were more commonly employed in community hospitals/multispecialty clinics ($p < 0.05$). Solo practitioners were less likely to prescribe acitretin, ILCSs, OIs, and nbUVB compared to other settings ($p < 0.05$).

Combination therapies including multiple treatment modalities were utilized by 56.6% of respondents, the most common regimens including TCSs and TCIs (18.0%), TCSs and oral antibiotics (including metronidazole and tetracyclines) (13.4%), TCSs and OIs (10.4%), TCSs and phototherapy (9.0%), and TCSs and retinoids (9.0%).

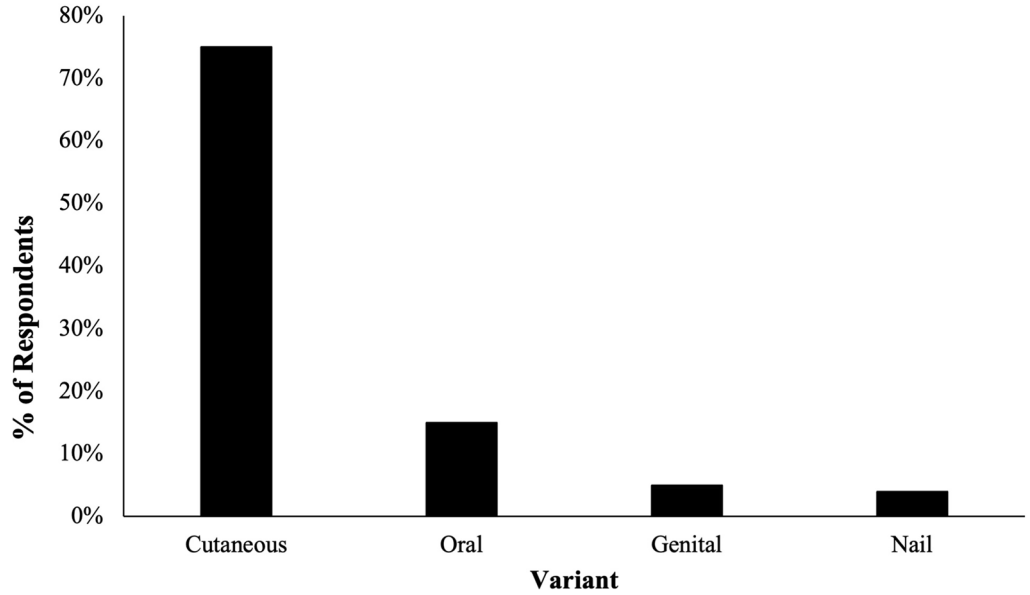

Fig. 1 Most commonly exhibited lichen planus variants

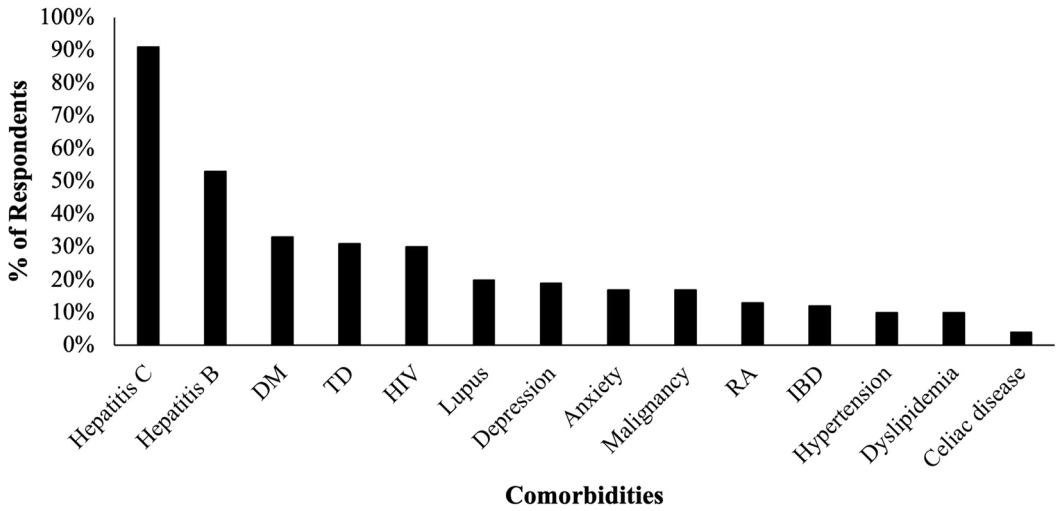

Fig. 2 Comorbidities screened for by respondents

Interestingly, one-quarter (25.3%) of respondents believed that there are FDA-approved medications for LP, and 23.6% did not know if any FDA-approved medications currently exist. The perception of FDA-approved medication availability for LP was associated with a respondent's level of training, with resident physicians being more likely than other respondents to express this misconception ($p<0.01$).

DISCUSSION

At this time, no US-based guidelines for LP management exist, and only limited literature provides recommendations for screening [13, 14]. While historically linked to HCV, estimations of comorbidity prevalence in a retrospective monocentric study of 619 patients identified HTN in

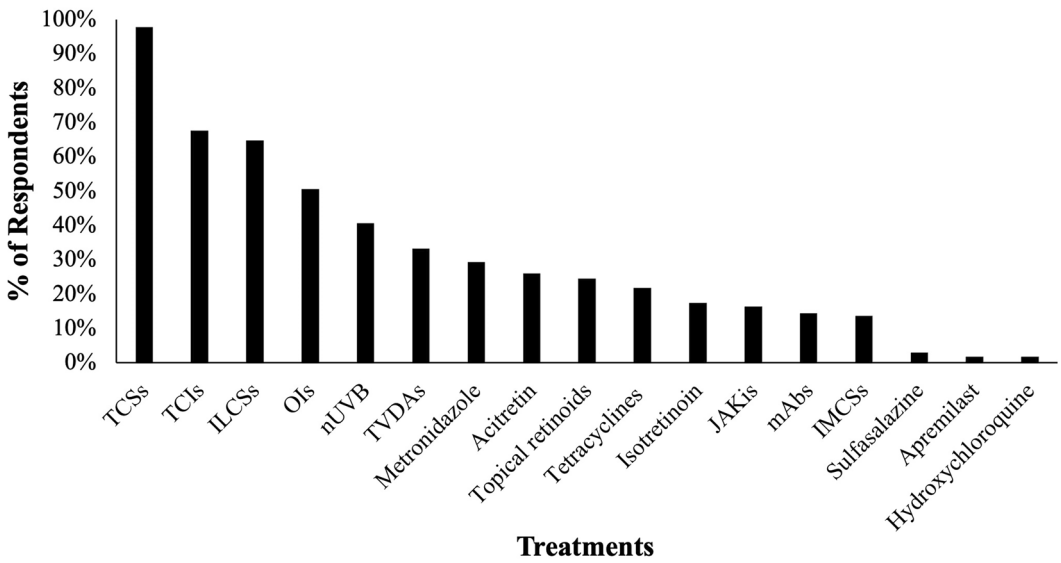

Fig. 3 Treatments prescribed by respondents

45.40% and hypercholesterolemia in 36.83% of patients, followed by notably prevalent malignancy (19.06%), metabolic disorders (15.51%), type II DM (16.35%), depression (12.76%), thyroiditis (12.44), and rheumatic diseases (11.95%) [5]. Screening patterns in our cohort are not consistent with these findings. Among clinicians performing screening, screening rates for common comorbid conditions were strikingly low and deviated from current evidence of comorbidity prevalences. HCV and HBV are rare comorbidities in patients with LP, found in only 0.64% and 0.56%, respectively, in a study of 3.6 million individuals [15]. Based on the European S1 LP management guidelines, the association between LP and HCV is geographically dependent, with screening recommended only in regions with a high prevalence of HCV. Still, HCV and HBV were the most screened for comorbidities, with almost all respondents screening for HCV. HIV is not an established LP comorbidity; however, over a quarter of respondents performed HIV screening [9]. While a potential explanation for these trends may be the inclination to perform comprehensive blood-borne infection screening given LP's association with HCV, these screening trends emphasize a misuse of resources in patients with LP without risk factors for hepatitis and/or HIV and ultimately opportunities for continued education.

DM and TDs are well-established comorbidities of oral LP (OLP), with estimated prevalences of 1.6–37.7% and 30–50% of patients with OLP, respectively [16, 17]. While DM and TDs were the third and fourth most commonly screened for comorbidities in this cohort, respectively, they were still only screened for by one-third of the respondents performing screening. These gaps in evidence-based screening practices may reflect OLP's infrequent presentation among patients treated by practitioners in this cohort, compounded by knowledge gaps.

Screening for depression, anxiety, HTN, and dyslipidemia showcase additional missed opportunities for the dermatologist to appropriately identify and manage comorbidities. Depression and anxiety have been reported to be present in as many as 42% and 44% of patients with LP, respectively, though screening for these psychological comorbidities was disproportionately low by this cohort [7, 14]. Similarly, only 10% of respondents screened for HTN and dyslipidemia despite their reported prevalence of up to 45% and 37% in patients with LP, respectively [5]. European S1 guidelines explicitly recommend lipid screening in patients with LP to identify those at risk for cardiovascular disease [9].

Gaps in comorbidity screening by dermatologists extend beyond LP. In one survey study, less than 20% of 73 dermatologists screened for systemic conditions associated with rosacea despite strong evidence of its association with HTN, dyslipidemia, DM, anxiety, and depression [18]. Similar underestimations of depression and anxiety were observed in a cross-sectional analysis of 3635 dermatology consultations in Europe, particularly among patients with hand eczema, psoriasis, and leg ulcers [19]. Large-scale US studies have demonstrated depression screening in only 2% of patients with hidradenitis suppurativa (HS) despite their frequent coexistence and suboptimal cardiovascular screening in patients with psoriasis, HS, and atopic dermatitis [20, 21].

Importantly, despite the numerous well-established associations between LP and comorbid conditions, 32.5% of our surveyed cohort performed no screening at all. Though targeted screening should be based on a patient's individual risk factors and presentation, almost one-third of this cohort entirely foregoing screening underscores a large gap in the holistic management of patients with LP. Additionally, increased screening likelihood by attending physicians highlights the potential role of advanced training and experience in influencing clinical decision-making, whereas other demographics and practice location appeared to play a lesser role in this context. Over half of attending physicians responding to the survey were ages 30–39; thus, the lack of association between screening and practitioner age suggests that clinical habits formed during training are more valuable in holistic LP management than the time spent in practice.

Clinicians of all levels would undoubtedly benefit from screening guidelines. Though European S1 guidelines for LP management are available, they were most recently released in 2020 and do not include more recently identified comorbidities [9]. Comorbidity screening guidelines for patients with LP could help close the screening gap, ensure that screening practices are on par with current evidence, and, most importantly, prevent comorbid conditions in patients with LP from remaining undiagnosed and untreated.

Regarding management of LP, TCSs are a central component of treatment, their use supported by level I evidence for treatment of cutaneous, oral, and scalp LP and European S1 guidelines for cutaneous and mucosal LP [9, 11, 14]. TCSs are mainstays in treating inflammatory dermatologic conditions, making their first-line placement in treating LP unsurprising [22]. The commonplace use of TCSs by this cohort for LP treatment mirrors the findings of a recent cross-sectional study of 1998 patients and a retrospective study of over three million patients in which TCSs were the most used treatment, prescribed to 38–48% of patients [4, 15].

TCIs were the second-most utilized treatment option in this cohort, with class IA and IB evidence supporting their use in cutaneous and OLP [11]. While some literature regards TCIs as a first-choice therapy equal to TCSs for OLP, TCIs are a second-line recommendation for cutaneous LP in the European S1 guidelines [9, 22]. ILCSs were the third most utilized treatment in this cohort, aligning with level I evidence on their efficacy in scalp LP as well as recommended use for cutaneous LP by European S1 guidelines [9, 11].

While European S1 guidelines and recommendations align with the popularity of OIs in this cohort, differing levels of evidence exist for the use of these agents. Interestingly, patterns in OI prescribing in this study cohort mirrored levels of evidence supporting their use. Methotrexate has class IIB evidence for use in cutaneous LP, aligning with its leading position among OIs, while azathioprine, the least frequently used OI, has only class IV evidence. Cyclosporine and mycophenolate mofetil have class III evidence for use in scalp LP and OLP, respectively, calling into question their frequent use despite low-quality evidence and significant side effect profiles [11].

Other treatments with class I evidence and recommendations for use by European S1 guidelines, including acitretin and isotretinoin for cutaneous and mucosal LP and phototherapy for cutaneous LP, were less frequently used in this cohort. Sulfasalazine and griseofulvin, used by only 3.0% and 0.5% of respondents, respectively, also have high-level evidence (level IB) for cutaneous LP [9, 11]. Less frequent use of

systemic retinoids may be limited by barriers to prescribing these agents. Insight into the limited use of phototherapy by this cohort was provided in respondents' comments, which detailed difficulties in obtaining insurance coverage for treatment and/or limited availability of phototherapy in their practice.

Varied use of agents with high-level evidence in cutaneous LP may be reflective of cutaneous LP's self-limited nature and relatively benign course, allowing for treatment deferment [9]. Additionally, only 4.2% of this cohort had a majority of patients presenting with severe LP. Among practitioners who care for more patients experiencing severe and/or recalcitrant OLP, the use of evidence-based treatments like oral retinoids may be warranted considering treatment challenges faced with OLP, effects on patients' quality of life, and potential malignant sequelae [13, 14].

For scalp and nail LP, TCSs, TCIs, ILCSs, systemic steroids, cyclosporine, hydroxychloroquine, and methotrexate are recommended by the European S1 guidelines. First-line treatment of isolated nail LP with ILCSs and intramuscular corticosteroids (IMCSs), specifically triamcinolone, is also recommended by an expert consensus of international dermatologists, with oral retinoids and OIs recommended as second-line agents [9, 23]. These recommendations align with this cohort's prescribing patterns, apart from hydroxychloroquine which was prescribed by less than 2% of respondents. Notably, however, nail LP was the least common variant treated by respondents.

The advent of newer treatment modalities for LP and their mounting evidence for use is reflected in the cohort's prescribing patterns. As the JAK/signal transducer and activator of transcription (STAT) pathway is believed to be implicated in the pathogenesis of LP, JAKis have proven useful in the treatment of all forms of LP. Another mechanism for targeting inflammation in LP has been through the use of phosphodiesterase 4 (PDE4) inhibitors, specifically apremilast, used most often in recalcitrant OLP. Additionally, targeting the IL-23/IL-17 pathway involved in LP through mAbs antagonizing these cytokines have proven useful [2]. The use of JAKis, PDE4 inhibitors, and mAbs by this cohort mirrors awareness of their utility in treating LP; however, the cohort's predilection for older mAbs, specifically anti-TNF agents, may reflect less up-to-date treatment practices.

The use of combination therapies in LP may draw from their success in the treatment of other dermatologic conditions [24, 25]. Through combining agents that modulate the immune response and inflammation, TCSs, TCIs, and retinoids may work synergistically or additively while simultaneously minimizing side effects. Of note, all the most common combination regimens included TCSs [24]. A similar immune-modulating mechanism can be postulated for the use of low-dose tetracyclines, phototherapy, and OIs [11]. Additionally, evidence of phototherapy's superiority to systemic steroids in cases of severe, recalcitrant, cutaneous LP refractory to TCS and OIs may speak to their prevalence in combination therapies [11, 14, 22].

The interplay of treatment choice and a respondent's demographic background was noteworthy, as older clinicians, physicians, and those in academic or group practice settings were more likely to prescribe systemic treatments. Tailored educational strategies and prescribing guidelines could address treatment variations to ensure evidence-based prescribing across demographics and practice settings.

While multiple treatment modalities have proven useful in the treatment of LP, none are FDA-approved for use in LP. Over one-quarter (25.6%) of respondents in this cohort believed that there are FDA-approved medications for LP, exemplifying a notable knowledge gap.

While this misconception may in part be due to the commonplace use of certain treatments for LP, like TCSs and TCIs, this data highlights an opportunity for continued education for clinicians, especially resident physicians, to best inform decision-making when presenting treatment options to patients.

Given the generalized questions included in this survey design, the ability to capture the nuance of treatment choices for individualized patient cases is limited. Seeking further insight into respondents' treatment algorithms for specific LP subtypes could provide greater clarity on the nuance of treatment options, as well as inform development of future guidelines.

The use of gift cards as incentives for the first 200 respondents may have potentially influenced participation. Additionally, while it was requested of respondents to answer questions on the basis of their knowledge at the time of responding, the anonymous and email-based distribution may have allowed for respondents to reference educational materials and sources while completing the survey. Lastly, while prescribing privileges do not fundamentally differ between different dermatology practitioners based on their level of specialization, factors such as institutional limitations for trainees, variations in patient payer mix, and greater willingness among academic dermatologists to use off-label therapies may have influenced treatment practices but were not specifically accounted for in this analysis.

CONCLUSIONS

This investigation into dermatologists' comorbidity screening patterns and treatment strategies for LP underscores significant opportunities for enhancing clinician education and ultimately patient care. The relatively low screening rates for many common comorbidities and relatively high screening rates for uncommon conditions highlight a gap in comprehensive, evidence-based management. Knowledge gaps extend to the persistent misconception regarding the availability of FDA-approved therapies for LP. Nonetheless, this cohort's use of some evidence-based treatments did align with available evidence. However, the use of systemic treatments with high-level evidence remains limited, potentially due to prescribing barriers, lack of guidelines, and variations in clinical exposure. These findings are generalizable to the broader dermatology community, as they reflect the practices of diverse practitioners of varying specialization levels and practice settings, capturing a range of experiences that can inform development of clinical guidelines and targeted education on LP. By bridging the knowledge gaps identified in this study and advocating for standardized guidelines for management, clinicians can better optimize care for patients with LP, reduce variability in management practices, and improve patient outcomes.

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Author Contributions. All authors made significant contributions to this manuscript as follows: Savanna I. Vidal, Nikita Menta, and Adam Friedman conceived the study design; Savanna I. Vidal, Nikita Menta, and Adam Friedman dispersed the survey and managed data collection; Savanna I. Vidal, Nikita Menta, and Adam Friedman analyzed the data and interpreted the results; and Savanna I. Vidal, Nikita Menta, and Adam Friedman wrote the manuscript and coordinated revisions. All authors reviewed and approved the final version of the manuscript.

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Data Availability. The data supporting the results reported in this manuscript are available in figures, tables, and supplementary materials. The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of Interest. Savanna I. Vidal's work is funded through an independent research grant from Galderma. Nikita Menta's work is funded through independent research grants from Incyte and Johnson & Johnson. Adam Friedman has no conflicts of interest to disclose.

Ethical Approval. This study received institutional review board approval from The George Washington University (IRB#: NCR224226). The study was conducted in full compliance with the Helsinki Declaration of 1964 and its subsequent amendments. Informed consent was obtained

from all study participants, and consent for publication of any identifying information has been secured from all participants involved in this study.

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