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# Treatment of erosive oral lichen planus with local ultraviolet B phototherapy

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**Background:** Oral lichen planus (OLP) is a chronic inflammatory disease that can significantly affect the patient's quality of life.

**Objective:** We sought to demonstrate the therapeutic efficacy of local ultraviolet (UV) B phototherapy in OLP.

**Methods:** Patients with biopsy-confirmed erosive OLP recalcitrant to previous medical therapy were treated with the TheraLight UV 120-2 system (TheraLight Inc, Carlsbad, CA). Lesions were accessed directly using a flexible fiber guide. Local phototherapy was delivered 3 times a week, with gradual increase in UVB dose every other session. Affected oral mucosa was defined as the area showing erosions or symptomatic reticular lesions. Complete response was defined as reduction of at least 80% in the affected mucosal area, and partial response was defined as a reduction of 50% to 80% in the affected mucosal area. The primary end point was efficacy after 8 weeks of treatment.

**Results:** Fourteen patients were included in the study. Nine achieved complete response and 5 partial response after 8 weeks. Ten patients were continued on maintenance therapy and were able to maintain their response for another 29 weeks. None of the patients showed any serious side effects from local UVB therapy.

**Limitations:** The study was performed in a small series of patients at a single medical center. Further studies with larger patient samples are required to validate our findings.

**Conclusion:** Local UVB phototherapy may be a promising treatment modality for erosive OLP. (J Am Acad Dermatol 2012;66:761-6.)

**Key words:** maintenance treatment; oral lichen planus; oral lichen planus global assessment scale; phototherapy; psoralen plus ultraviolet A; targeted UVB.

Oral lichen planus (OLP) is a chronic inflammatory disease affecting between 0.5% and 2.2% of the population. Although OLP can appear at any age, a higher prevalence has been documented in 30- to 60-year-old women.<sup>1</sup> The origin remains unknown, although amalgam restorations and hepatitis C virus have been implicated as possible etiologic factors.<sup>2,3</sup> Clinical subtypes of OLP

#### Abbreviations used:

CR:	complete response
MED:	minimal erythematous dose
OLP:	oral lichen planus
PDT:	photodynamic therapy
PR:	partial response
PUVA:	psoralen plus ultraviolet A
UV:	ultraviolet

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The commercially available TheraLight unit is owned by the

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include the reticular, atrophic, hypertrophic, and erosive forms, or combinations of these subtypes. Symptoms range in severity from local irritation and minimal discomfort to bleeding and difficulty in speaking and swallowing; in severe cases, patients may seek acute medical attention, requiring an emergency department visit or inpatient admission, because of oral infections and hemorrhage.<sup>1</sup> OLP tends to follow a chronic course with superimposed acute exacerbations, and hence, the disease can be debilitating and adversely impact the patient's quality of life.<sup>4</sup> Moreover, oral squamous cell carcinoma arising in association with OLP has been reported,<sup>5</sup> although a causative relationship remains controversial.<sup>6</sup>

Topical corticosteroids are currently the first line of therapy for OLP. Additional therapeutic agents that have been reviewed in the literature include topical tacrolimus, systemic corticosteroids, retinoids, methotrexate, and cyclosporine.<sup>7</sup> In recent years, phototherapy, either in the ultraviolet (UV) B or UVA range, has been reported as a treatment modality that can be used in OLP. For example, psoralen plus UVA (PUVA) therapy, and extracorporeal photochemotherapy have been used for recalcitrant OLP; and excimer 308-nm laser, aminolevulinic acid, and methylene blue-mediated photodynamic therapy (PDT) have shown efficacy in the treatment of erosive OLP.<sup>8-15</sup> The carcinogenic potential of PUVA therapy, and the high cost of extracorporeal photochemotherapy and PDT have been limiting factors to their widespread use in OLP.

In this study, we describe the use of local UVB-based phototherapy for OLP. To this end, we used a targeted phototherapy device, TheraLight lamp (TheraLight Inc, Carlsbad, CA), which received a 510(k) clearance from the Food and Drug Administration; this device has been previously shown to be equivalent to other UVB-based phototherapy devices for the treatment of psoriasis, vitiligo, and atopic and seborrheic dermatitis.<sup>16-18</sup> The main benefit of targeted UVB-based therapy is the ability to deliver higher radiation doses directly to oral mucosa affected by OLP.

## METHODS

Patients included in the study were those with a clinical diagnosis of erosive OLP, confirmed by

histopathology showing typical findings of OLP. All patients had failed to respond to previous topical and local treatments including clobetasol propionate, dexamethasone, topical tacrolimus, and intralesional methylprednisolone acetate injections. The study was approved by the institutional Helsinki committee and written informed consent was obtained from all patients.

The TheraLight UV 120-2 system was used (TheraLight Inc). The device emits UVB radiation in the range of 290 to 320 nm, with a mean weighted erythral wavelength of 304 nm. The use of a flexible fiber guide with a square aperture of 1.9 × 1.9 cm allowed for direct access to the oral lesions.

As there are currently no data to guide the initial UVB radiation dose, nor the subsequent incremental dose escalations, we decided that

the minimal erythral dose (MED) would be used as a surrogate to guide oral treatment doses. The current therapeutic protocol for OLP was based on the methodology used in a previous study that we conducted, testing the efficacy of the UVB phototherapy in cutaneous lichen planus.<sup>19</sup> In brief, after determining the cutaneous MED, patients were treated with local UVB 3 times a week, starting at 20% of MED and increasing by one third of MED every other session.

Clinical evaluation during the study was performed by board-certified oral medicine and dermatology specialists at baseline, every 2 weeks during the course of therapy, and monthly in the case of treatment discontinuation for another 2 months. The presence of erosive lesions, subjective symptoms, and concurrent use of topical steroids and topical tacrolimus were recorded during patient visits. For the clinical evaluation, affected oral mucosa was defined as the area showing erosions or symptomatic reticular lesions.

The primary end point was efficacy after 8 weeks of treatment. Complete response (CR) was defined as reduction of at least 80% in the affected mucosal area and/or asymptomatic reticulations, compared with baseline evaluation, and partial response (PR) was defined as reduction of 50% to 80% in the affected mucosal area and/or mild symptoms. No response was defined as improvement in less than 50% of the affected mucosal area to no improvement and/or moderate to severe symptoms.

## CAPSULE SUMMARY

- Oral lichen planus is a chronic inflammatory disease for which effective treatment is lacking.
- Our study demonstrated a high response rate of erosive oral lichen planus patients to local ultraviolet B. No significant side effects were observed during the study.
- Targeted ultraviolet B is a suitable option modality for the ambulatory patient care and could be used as steroid-sparing agent.

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