

# Managing Postinflammatory Hyperpigmentation



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Postinflammatory hyperpigmentation (PIH) is a common sequela of inflammatory dermatoses and a potential complication of cosmetic procedures in patients with skin of color. Traditionally, management of PIH involves treating the underlying dermatosis (if applicable), recommending sun protection to avoid exacerbation from UV radiation-induced melanogenesis, and allowing time for spontaneous resolution of the hyperpigmentation. Although these methods still constitute the fundamental treatment approach, in my experience patients frequently are dissatisfied with a regimen that does not include active treatment of the PIH, which is understandable given the cosmetic disfigurement that patients often experience with pigment alterations. Therefore, application of topical skin-lightening agents and in-office procedures such as chemical peels usually are required to hasten the resolution of PIH, thus improving patient satisfaction. Although this column will discuss several effective treatment options for PIH, none of them provide as rapid a resolution as patients typically desire; therefore, managing patient expectations is an important component in the treatment of PIH. Cover-up cosmetics can be useful adjuncts, allowing patients to conceal lesional skin in the weeks to months leading up to PIH resolution.

## Topical Agents

Evidence supporting the treatment of PIH is limited to few published studies and anecdotal experience. Formulations containing hydroquinone are used most frequently

in the treatment of PIH. Hydroquinone reduces hyperpigmentation by inhibiting tyrosinase, the rate-limiting enzyme in melanin synthesis, and is considered the gold standard among skin-lightening agents; however, hydroquinone also is associated with the risk for developing a halo of hypopigmentation on perilesional skin, especially when treating the small hyperpigmented macules characteristic of acne-associated PIH; irritant contact dermatitis, particularly when treating with concentrations greater than 4%; and exogenous ochronosis associated with prolonged use or misuse of hydroquinone.

Despite its widespread use in the treatment of PIH, there is a paucity of published studies investigating the efficacy of hydroquinone for this indication. In a 12-week open-label study of 28 participants (12 who had PIH), application of a microsphere formulation of hydroquinone 4% and retinol 0.15% demonstrated significant improvement in disease severity, pigmentation intensity, and colorimetry measurements compared with baseline as early as week 4 ( $P < .001$ ).<sup>1</sup> The largest published study on the treatment of PIH is a multicenter randomized trial that compared the efficacy of a triple-combination bleaching cream containing fluocinolone acetonide 0.01%, hydroquinone 4%, and tretinoin 0.05%, to each of its dyads over 8 weeks ( $N = 792$ ). Forty-five percent of participants were clear or almost clear in 8 weeks in the triple-combination treatment group; however, the study was not sufficiently powered to detect a significant difference between the triple-combination cream and all the dyads.<sup>2</sup>

Topical retinoids also have been studied in the treatment of PIH. In a 40-week randomized, double-blind, vehicle-controlled trial of 54 participants, facial PIH lesions were significantly ( $P < .001$ ) lighter after 40 weeks of treatment with tretinoin versus vehicle. Reduced pigmentation also was observed on colorimetry and histopathology.<sup>3</sup> Published studies have shown that tazarotene cream 0.1%,<sup>4</sup> adapalene gel 0.1%,<sup>5</sup> and fixed-combination clindamycin phosphate 1.2%–tretinoin 0.025% gel<sup>6</sup> are efficacious in the treatment of acne-associated PIH.

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Azelaic acid gel 15% was studied in the treatment of acne-associated PIH. A 16-week open-label, pilot study of 20 participants with acne and moderate to severe PIH demonstrated at least a 2-point improvement in all participants according to investigator global assessment of PIH severity; 31% of participants had no PIH at week 16.<sup>7</sup>

Although they have not been studied in the treatment of PIH per se, cosmeceuticals that contain botanical ingredients with skin-lightening properties may be considered as adjunctive or alternative agents in the management of PIH. These formulations contain kojic acid, soy, licorice extracts, niacinamide, and *N*-acetylglucosamine.<sup>8</sup> When used alone, these agents generally demonstrate modest improvements in facial hyperpigmentation that are at best comparable to but not superior to hydroquinone 4%. In my experience, cosmeceuticals are particularly useful in combination with prescription hydroquinone formulations to enhance skin-lightening efficacy or as hydroquinone-sparing agents when prolonged treatment is required.

### In-Office Procedures

Chemical peels frequently are employed as adjuncts to topical therapy in the management of PIH because they remove excess epidermal melanin and enhance the penetration of topical skin-lightening agents. Published evidence of chemical peels used in the treatment of PIH is limited to small studies,<sup>9-12</sup> but anecdotally they appear to hasten the resolution of hyperpigmentation when used concomitantly with bleaching agents. In patients with skin of color, peels generally should be limited to superficial peeling agents such as buffered glycolic acid 20% to 70%, salicylic acid 20% to 30%, and Jessner solution to minimize the risk for potentially disfiguring pigmentary complications.<sup>13</sup> Lower concentrations of trichloroacetic acid (10%–20%) can be used with caution in darker skin types because there is a narrower margin of safety with this peeling agent. As a general rule, the safest approach to treatment with chemical peels is to start with the lowest concentration of any peeling agent and titrate upward as tolerated. This approach is strongly recommended for patients with skin of color given the high risk for iatrogenic dyspigmentation.

Lasers have been used for the treatment of PIH with mixed results. The literature is limited to small case series and reports.<sup>14-16</sup> In my experience, nonablative fractional resurfacing in conjunction with hydroquinone before and after treatment can be useful in patients with recalcitrant PIH; however, a small randomized study of fractional photothermolysis did not demonstrate efficacy in the

treatment of PIH.<sup>17</sup> In short, more studies are needed to confirm the safety and efficacy of laser therapies for PIH, particularly in Fitzpatrick skin types IV to VI.

### Summary

Management of PIH remains a major challenge in patients with skin of color. Maximizing patient satisfaction and treatment outcomes involves a combination of controlling the underlying cause of the PIH, using skin-lightening agents and in-office procedures judiciously, and ongoing sun protection; a healthy dose of patience also is important.

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