

# Managing Postinflammatory Hyperpigmentation in Pediatric Patients With Skin of Color

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## PRACTICE POINTS

- The US population of children with skin of color is growing rapidly.
- Treating the underlying inflammatory dermatosis is the most important step in managing postinflammatory hyperpigmentation (PIH); however, many pediatric PIH patients and their parents/guardians presenting with a chief concern of pigmentary changes are unaware of the associated inflammatory condition.
- When appropriate, choose treatments for the underlying inflammatory condition that can simultaneously improve any existing PIH. Gentle skin care, avoidance of rubbing and scrubbing the skin, and photoprotection are essential to halt worsening of PIH.
- Patients' parents/guardians may consent to more aggressive PIH treatment in select cases (eg, emotional distress in adolescents).

Postinflammatory hyperpigmentation (PIH) is common in patients with skin of color. Notably, the US population of children with skin of color is growing rapidly. Postinflammatory hyperpigmentation can be quite distressing in pediatric patients, particularly among adolescents and their parents/guardians. Therefore, it is crucial that dermatologists can identify and treat underlying inciting inflammatory dermatoses in this patient population. In this article, management strategies for PIH in pediatric patients with skin of color are presented.

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**P**ostinflammatory hyperpigmentation (PIH) is an acquired hypermelanosis that can occur in children and adults following an inflammatory cutaneous

disease or trauma. Postinflammatory hyperpigmentation may last for months to even years. Although PIH may occur in all skin types, it is more common and presents with greater severity and intensity in individuals with skin of color. By the year 2050, 1 in 3 US residents is projected to be Hispanic.<sup>1</sup> It is projected that by 2044, non-Hispanic white individuals (all ages) will make up less than 50% of the US population.<sup>2</sup> Currently, the majority of the US residents younger than 18 years are minorities. The majority minority population in the United States already exists in those younger than 18 years and is predicted to occur in the adult population by 2044.<sup>2</sup>

Effective treatment options and management strategies for PIH in adults with skin of color have been described in the literature.<sup>3</sup> Due to a paucity of research, the approach to management of PIH in children with skin of color has been based on clinical experience and lessons learned from adult patients. This article focuses on management of PIH in pediatric patients with skin of color, which includes black/African American, African-Caribbean, Hispanic, Asian, Pacific Islander, and American Indian individuals.

## Underlying Inflammatory Dermatoses Resulting in PIH

There are numerous conditions that may result in PIH, including but not limited to atopic dermatitis (AD), acne, arthropod bites, and injuries to the skin. Postinflammatory hyperpigmentation may have more of a psychological

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impact than the inciting disease or injury itself. The most important step in the approach to managing PIH is treating the underlying inflammatory condition that caused the pigmentation.

Parents/guardians may report a chief concern of dark spots, *manchas* (stains), blemishes, or stains on the skin, often with no mention of a coexisting inflammatory dermatosis. Parents/guardians of children with skin of color often have personally experienced PIH and may be determined to shield their children from similar angst associated with the condition. Although physicians may see just another pediatric patient with PIH, the child's parents/guardians may see a condition that will be readily perceptible during major life events, such as the child's prom or even his/her wedding day. Promptly diagnosing and instituting early treatment of inflammatory conditions associated with PIH may accelerate resolution and prevent worsening of the pigmentation.<sup>3</sup>

Select inflammatory dermatoses that are common in children with skin of color and may lead to PIH are highlighted below. Although this list is not comprehensive, the approach and management strategies should prompt creation of plans that keep PIH in mind when treating primary inflammatory skin diseases.

**Atopic Dermatitis**—Atopic dermatitis may induce PIH or hypopigmentation of the skin in children with skin of color. Developing a plan for AD flare prevention, as well as management of mild, moderate, and severe AD flares, is imperative in pediatric patients. Prevention plans should include gentle skin care, twice-daily application of emollients to the full body, and reduction of *Staphylococcus aureus* loads on the skin. The treatment action plan for mild to moderate flares may include topical corticosteroids, immunomodulators, and nonsteroidal agents. Treatment options for severe AD or patients who were unsuccessfully treated with other therapies may include phototherapy, biologics, and methotrexate, among others.<sup>4</sup> Creating action plans for AD flares is a vital step in the prevention of PIH in patients with skin of color. Additionally, PIH should not be considered a sign of AD treatment failure.

**Acne**—Acne is a common skin disorder seen in patients with skin of color.<sup>5</sup> A prospective observational study found that 34.3% of 683 children aged 9 to 14 years in a pediatric ambulatory clinic had acne.<sup>6</sup> The number of preadolescents with acne is growing. Most cases are not associated with underlying endocrinopathy.<sup>7</sup> With the growing population of children with skin of color in the United States along with the increasing childhood acne rate and subsequent inherent risk for hyperpigmentation, early acne interventions should be considered in pediatric acne patients with skin of color to reduce the impact of PIH in those at risk.

In a survey study of 313 adult acne patients with skin of color, 37.2% reported the presence of dark marks lasting 4 months or longer.<sup>5</sup> Regardless of the severity of the acne, treatment should be initiated as tolerated in those with PIH. Adolescent acne patients with skin of color may

develop PIH that is more severe and longer lasting than the acne itself.

The foundation for treatment of acne in adolescent skin of color patients is the same as those without skin of color, including topical retinoids, topical antibiotics, oral antibiotics, and isotretinoin when needed. Topical tretinoin, adapalene, azelaic acid, and tazarotene not only treat acne but also are a valuable part of the treatment armamentarium for PIH. Several studies in adults with skin of color have demonstrated improvement of PIH from the use of topical retinoids alone.<sup>8-10</sup> Despite wanting to treat the acne aggressively, special guidance should be given to prevent retinoid dermatitis, which may lead to PIH.<sup>10</sup> Demonstrating the application of the topical acne medications, discussing how to avoid potential side effects, and giving permission to skip applications, if needed, may empower families to make adjustments between visits to limit irritation that might prompt further PIH. Incorporating  $\alpha$ -hydroxy acid–based cleansers,  $\alpha$ -hydroxy acid–based chemical peels, or salicylic acid chemical peels may be warranted in the setting of intense PIH. Selecting treatments that not only help the inflammatory disease leading to the PIH but also can help improve the pigmentation are preferred; however, the risks and benefits have to be weighed because many treatments that work well for PIH also may cause irritation, leading to new or worsening PIH.

**Arthropod Bites**—Arthropod bites cause inflamed pruritic papules and nodules, and the resulting PIH in those with darker skin types may be quite dramatic. Parents/guardians should be instructed to have a low-potency topical corticosteroid on hand to use on bites for a few days when they appear, which will not only help with the inflammation associated with the bite but also will help decrease pruritus and subsequently skin injury from scratching. In homes with pets, checking animals routinely for fleas and other infestations is helpful. In the setting of repeated arthropod bites in the spring and summer, applying bug repellent with 10% to 30% DEET (N,N-diethyl-meta-toluamide) on the child's clothing and exposed body areas before playing outside or in the morning before school or camp may prevent some bites. There are DEET alternatives, such as picaridin, that may be used. Product instructions should be followed when using insect repellents in the pediatric population.<sup>11</sup>

## PIH Management Strategies

**Gentle Skin Care Routine**—There are misconceptions that areas of hyperpigmentation on the skin are caused by dirt and that scrubbing the skin harder may help to lighten the affected areas. Parents/guardians may report that the child's skin looks dirty or, in the setting of acne, view dirt as the cause of the skin condition, which may prompt the patient to scrub the skin and the friction further worsens the PIH. Use of daily gentle cleansers and moisturizers is advised to keep the skin moisturized and free of

further potential irritation and dryness that may prompt scratching or flares of the underlying condition.

**Photoprotection**—During the treatment course for PIH, using sun protection is helpful to prevent further darkening of the PIH areas. Sun protection may be in the form of broad-spectrum sunscreen, hats, or sun-protective clothing. Patients should be encouraged to apply sunscreen daily and to reapply every 2 hours and after water-based activities.<sup>12</sup> For pediatric and adolescent populations, practicing sun-protective behaviors before school or outdoor activities also should be advised, as many families only think about sun protection in the setting of sunny vacation activities. Research has demonstrated that individuals with skin of color may not realize that they can be affected by skin cancer,<sup>13</sup> thus they may not have any experience selecting, applying, or regularly using sunscreens. Products that do not leave a white hue on the skin are suggested for adolescents who may be sensitive about their appearance following sunscreen application.

**Skin Lightening Treatments**—Although the most important therapy for PIH is to treat the underlying inflammatory conditions, some parents/guardians may desire additional options due to the extent of involvement of the PIH, its psychological impact on the child, or adverse effect on the child's quality of life.<sup>14</sup> In adolescents, incorporating an  $\alpha$ -hydroxy acid–based cleanser, glycolic acid chemical peels, salicylic acid chemical peels, and topical cosmeceuticals may be warranted in the setting of intense PIH and acne. However, irritation may lead to further dyspigmentation.

Topical ammonium lactate 12% is lactic acid neutralized with ammonium hydroxide that is formulated as a lotion or a cream. It is used to hydrate dry skin and may decrease corneocyte cohesion.<sup>15</sup> Topical ammonium lactate also has been used anecdotally for PIH on the body during periods of watchful waiting.

Topical hydroquinone, the gold standard for treating hyperpigmentation,<sup>3,16</sup> is not approved in children, but some parents/guardians elect to utilize hydroquinone off label to accelerate the clearing of distressing PIH in adolescents. Careful consideration including a discussion of potential risks and alternatives (eg, watchful waiting) should be highlighted.

In the setting of chronic inflammatory conditions that recur and remit, potentially irritating topical treatments should be used only during periods when symptoms of inflammation such as itching or erythema are absent.

## Conclusion

Despite the best management efforts, PIH in some patients with skin of color may be present for months to years. In the pediatric skin of color population, treatment of the underlying inflammatory condition, gentle skin care, use of photoprotection, and time may be all that is

needed for PIH resolution. With their parent/guardians' consent, adolescents distressed by PIH may decide to pursue more aggressive, potentially irritating treatments. Above all, the most important management in the setting of PIH is to treat the underlying inflammatory condition causing the PIH and set reasonable expectations. For challenging cases, pediatric dermatologists with special expertise in treating pediatric and adolescent patients with skin of color may be consulted.

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