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A Brief Primer on Acne Therapy for Adolescents With Skin of Color

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Practice Points

- Acne in adolescents of color requires careful attention to skin care and hair care practices.
- Clues to pomade-exacerbated acne in adolescents of color are the presence of many lesions on the upper segment of the face with relative sparing of the cheeks and chin.
- Hyperpigmentation, erythema, and scarring, including keloids, are common sequelae in adolescents of color with moderate to severe acne.
- Therapy for acne in adolescents of color involves a combination of improved skin care, sun avoidance, and consistent therapeutic management.

The majority of adolescents with skin of color in the United States and other westernized civilizations develop acne vulgaris. Indigenous populations of children and teenagers with skin of color may not develop acne when raised on a paleolithic diet, suggesting the Western diet is the rudiment of acne vulgaris. Differences exist in the presentation of and therapy for acne in teenagers with skin of color, largely due to the increased risk for hyperpigmentation, scarring, and keloid formation, as well as style- and skin care-related exacerbating factors. The primary goal of acne therapy in adolescents with skin of color is the prevention of long-term sequelae such as keloid formation. This article provides a brief overview of the treatment of acne vulgaris in adolescents with skin of color.

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Acne vulgaris is a chronic heritable skin disorder that can affect individuals of all races and ethnicities in westernized civilizations. In the United States, acne is the second most common diagnosis in black, Asian, and Hispanic patients presenting to dermatologists.¹ Acne appears to be more prevalent in females with skin of color, especially black women aged 10 to 70 years. In particular, dyspigmentation and atrophic scarring are more prevalent in black and Hispanic females with acne.² Acne is the fourth most common diagnosis in the pediatric population, and almost half of cases occur in children with skin of color.³ This article reviews some of the concepts that affect identification, workup, and therapy in adolescent acne patients with skin of color.

Puberty

Acne can start any time after the onset of adrenarche; in fact, acne is considered one of the first indicators of pubertal onset. In the United States, it has been observed that girls are beginning to enter puberty at an earlier age than they did 30 years ago.⁴ One study identified a clear trend in earlier initial visits for acne in all children from 1979 to 2007, further supporting earlier onset of puberty.⁵ In this study, the mean age of black boys and girls at the time of acne visits trended downward without significance⁵; however,

data already strongly support an early age of onset of puberty for children with skin of color.

In a study conducted in East Harlem, New York; metropolitan areas in Cincinnati, Ohio; and San Francisco, California (N=993), stage 2 or greater breast development was noted by 7 to 8 years of age in 10.4% of white, 23.4% of black non-Hispanic, and 14.9% of Hispanic girls.⁴ The earlier need for treatment has resulted in a variety of new challenges, including issues regarding the application of acne products, which often are formulated for oily skin, on young dry faces, potentially causing greater irritation and increasing the possibility of greater cumulative scarring over the course of many more years of acne. Furthermore, most acne products are approved by the US Food and Drug Administration for children older than 12 years, leaving a paucity of approved products available for treatment of acne in young patients with skin of color.

Diet, Obesity, and Endocrinopathies

Obesity is increasingly prevalent in adolescents with skin of color, especially black female adolescents.⁶ Hidradenitis suppurativa is more common in individuals with greater body mass indexes; however, data on the relationship between acne and weight are lacking in the literature.⁷ When obesity is noted in acne vulgaris patients, workup for metabolic syndrome includes screening for insulin resistance in males due to an increased risk for insulin resistance in obese males with acne⁸ as well as screening for insulin resistance and sex hormone irregularities in females. It is especially important to consider that there is a greater prevalence of diabetes mellitus in black and Hispanic patients in the United States with insulin resistance as the rudiments in adolescence.⁹ Thus when laboratory tests are ordered for females, glucose and insulin should be added to the panel, which also may be the first abnormal tests in polycystic ovary syndrome.¹⁰

Congenital adrenal hyperplasia is more common in some groups of individuals with skin of color and should be considered in the workup of hirsute acne patients with menstrual irregularities. These variants may not be identified with newborn screening.^{11,12} Screening questions for adolescent girls with acne vulgaris include menstrual irregularities, excessive premenstrual symptoms, and hirsutism. For girls younger than 8 years and boys younger than 10 years, endocrine referral may be needed. Early-onset acne (<10 years of age) in girls of any ethnicity confers a greater risk for disease severity.¹³

Cordain et al¹⁴ identified an absence of acne vulgaris in individuals from any age group among ethnic Aché hunter-gatherers in Paraguay and

Kitavan Islanders of Papua New Guinea, which suggests that the Western diet may be contributory to the pathogenesis of acne and that a paleolithic diet may be a beneficial method of acne prevention, though perhaps not practical in the United States.¹⁵ A study of teenagers and young adult males (age range, 15–25 years) in Australia demonstrated that a low-glycemic diet may be beneficial for treatment of acne in overweight males¹⁶; however, the study has not been repeated in a mixed ethnic population. The benefits of dietary modification in children with skin of color are unknown; however, a low-glycemic diet may induce weight loss and benefit metabolic syndrome risks in overweight patients.

Presentation Nuances

The Table includes factors that should be considered when taking the history of adolescent acne patients with skin of color. Presentation of acne in patients with skin of color is complicated by a few issues. First, Asian patients are more likely to experience erythema after acne lesion clearance, while black and Hispanic patients are at a higher risk for dyspigmentation and scarring, including keloid formation. Cystic acne is more prevalent in blacks and Hispanics than in white patients. In a study of 313 patients with acne, Taylor et al¹⁷ noted hyperpigmentation in 65.3% of black acne patients, 52.7% of Hispanic acne patients, and 47.4% of Asian acne patients. Hyperpigmentation often is more upsetting to the patient than the original acne lesions. Erythema is a common sequela of acne in Asian teenagers. Keloids can form from inflammatory acne lesions in black patients and other adolescents with skin of color. Pore size, sebum production rates, and sebaceous gland size are known to be varied among adults of different races, but data are lacking for adolescents.¹⁷ In teenagers with skin of color, I look for acne that predominates across the upper forehead with minimal midfacial or chin lesions. If the patient has dozens of papules on the forehead but less than 10 on the face below the eyes, pomade acne is likely contributing to the severity of the patient's disease.

Hairstyling and Skin Care Products

Any occlusive or thick product that is applied to the scalp (on the face or hair) may cause follicular occlusion and produce a monomorphic acne known as pomade acne or acne cosmetica. Lanolin, cocoa butter, and petrolatum seem to be the leading agents to cause this issue, and an alteration to silicone or water-based gel agents is best for hair care. Care should be taken to differentiate traction folliculitis from aggressive hairpulling and pomade acne. In my experience treating teenagers with skin of color, the

Complete Acne History in Adolescents With Skin of Color

Location of acne (ie, face, chest, back, shoulders, hairline)

Severity of lesions (ie, mild, moderate, severe, dyspigmentation, scarring)

Frequency of outbreaks or flares and triggers

Prior therapy (ie, over-the-counter, home remedies [eg, toothpaste], prescription agents)

Ingestion of medications or topical medicament usage (questions regarding medication tube color can identify individuals who are noncompliant)

Pregnancy planning and usage of prevention

Menstrual cycle regularity or lack thereof (females)

Family history of scarring, severe acne, keloids, and diabetes mellitus

Facial sensitivity (patients with acne limited to the T-zone are presumed to have less generalized oil production)

Sunscreen usage

Cosmetic usage and hair care products

Physical activities and sports

majority of cases of pomade acne, similar to steroid acne, actually are a combination of standard acne exacerbated by *Pityrosporum* folliculitis, which can be confirmed with a potassium hydroxide preparation. Antifungal shampoos and salves can aid in clearance of these lesions.¹⁸ Although male patients are less likely to use pomades, frequently wearing baseball hats without washing them creates a stimulus for forehead acne in adolescent males with skin of color who favor this style. In my experience, the leading skin care-related issue in individuals with skin of color is a lack of familiarity with appropriate sunscreen usage, which acts as a barrier to good sun protection during therapy. Many teenagers of color will not comply with sunscreen regimens required for improvement of skin tone due to lack of understanding of the role of sunscreens.

Consensus Data

In May 2013, a consensus position paper from the American Acne & Rosacea Society was published regarding pediatric and adolescent acne. The article adds a variety of important pieces to the literature, such as the need for endocrine screening in patients aged 1 to 7 years with acne.¹⁹ The treatment position does not differ strongly from that of the Global Alliance to Improve Outcomes in Acne publication of 2003,²⁰ and furthermore does not address the particular issue of acne as it pertains to adolescents of color.

Nuances in Asian Patients

A consensus group developed therapeutic guidelines for acne therapy in Asian patients. The authors relied heavily on the Global Alliance to Improve Outcomes in Acne and the consensus guidelines of 2003.²⁰ The Asian group modified the Global Alliance recommendations slightly for Asian individuals. They identified the prevention of facial scarring and postinflammatory changes as the leading objectives for acne therapy in Asian patients.²¹ In my opinion, the recommendations are sound and apply to all patients with skin of color.

For cases of mild acne, the group recommended treatment with topical retinoids and topical antimicrobials for inflammatory lesions.²¹ More aggressive therapy may be needed in individuals with a family history of scarring. For moderate disease, retinoids, topical antibiotics, and benzoyl peroxide are recommended. Antibiotics are considered a first-line treatment in cases of severe disease, with isotretinoin as a second-line treatment. Oral antibiotics and oral contraceptives in females (adolescent and/or adult) are second-line treatments in patients with mild to moderate disease.²¹

The authors cited some therapeutic issues, including a propensity for discoloration in Asian patients.²¹ According to the authors, Asian patients perceive acne as a right of adolescence that does not require therapy; there also is a poor understanding of the potential scarring consequences of acne. The authors also identified some interesting regional variations, including increased rates of steroid-induced acne in Hong Kong and a high rate of antibiotic phobia. Other interesting variations included use of over-the-counter adapalene products in India, a prevailing feeling that Asian patients respond to retinoids more slowly than white patients, and usage of topical retinoids in 70% of Thai acne patients. The authors suggested hydroquinone with or without a retinoid (or combination with corticosteroids) for treatment of hyperpigmentation, pulsed dye laser therapy for erythema, and a variety of agents (eg, retinoids,

chemical peels, lasers, microdermabrasion, intense pulsed light) for scarring.²¹

Treatment Pearls for Acne Patients With Skin of Color

Acne therapy in patients with skin of color needs to be tailored to 3 factors: the patient's age, risk for scarring, and tolerance of medicaments. The core medications for patients with skin of color are not different than those identified by the Global Alliance in 2003²⁰ or consensus data of 2013¹⁹; however, some products have better data in individuals with skin of color. The mechanisms of action of acne agents are outside the scope of this article, but extensive reviews are available in the literature.^{17,22} Irrespective of race or ethnicity, the simplification of acne regimens by using topical combination agents versus multiple separate administrations will enhance compliance and outcomes in teenagers.²³

Sunscreen

Sunscreen (sun protection factor 30+) is an important promoter in the healing of acne scars and reduction of long-term dyspigmentation resulting from acne in adolescents with skin of color. The fact that many patients with Fitzpatrick skin types IV to VI are unaccustomed to applying sunscreen and their family members are less likely to be users of sunscreen may impede sunscreen compliance in this patient population. Usage of noncomedogenic facial sunscreen in the morning is the first therapy for acne as well as the dryness, sun sensitivity, or irritation initiated by acne therapies. Noncomedogenic emollient sunscreens for daily usage and gel-based sunscreens that provide a higher sun protection factor without the look of white paste on dark skin for prolonged activity often are advisable.

Retinoids

Retinoids are effective both against noninflammatory and inflammatory acne and can help reverse scarring and dyspigmentation. Specific data are available on retinoids in acne, including all 3 topical prescription agents: adapalene, tazarotene, and tretinoin. Tazarotene does not have published data specific to adolescents with skin of color; however, a recent study comparing tretinoin microsphere gel 0.4% and tazarotene cream 0.05% in 40 acne patients 12 years and older included 35% black patients. At week 12, the results indicated a more than 50% overall reduction in dyspigmentation by at least 1 score point in both treatment groups, but dyspigmentation in 5% of patients treated with tazarotene increased by 1 score point or more.²⁴ Another study of tazarotene gel 0.1% included 126 Indian patients aged 13 to 30 years and

showed excellent results; notably, more than 90% of patients with noninflammatory and inflammatory acne experienced moderate to complete clearance by weeks 8 and 12.²⁵

Overall, the side effects of treatment with any retinoid can include peeling and irritation. When topical retinoids are used, application of noncomedogenic emollients can aid in tolerability among teenagers, including Asian patients.²⁶ Side effects are dose dependent; therefore, reduced dosing frequency can aid in drug tolerance. In my experience, alternate evening usage for the first 2 weeks of therapy and thereafter for signs or symptoms of peeling can aid in acclimation to topical retinoid use. For the youngest acne patients (aged 6–10 years), twice weekly retinoid application may be all that is tolerable. The retinoids with the lowest minimum age recommendations are 10 years old for a tretinoin 0.05% gel preparation (Atralin, Medicis, a division of Valeant Pharmaceuticals) and 9 years old for a fixed combination adapalene 0.1% and benzoyl peroxide 2.5% gel (Epiduo, Galderma Laboratories, LP); limitations associated with this product are a contraindication for children with fish allergies and a lack of specific data regarding use in younger patients with skin of color.

Meta-analysis data from 2002 on the use of adapalene in black patients indicate that the medication may be more effective for treatment of inflammatory lesions in Fitzpatrick skin types IV to VI than in white patients and that tolerance may be slightly superior, with reported data in patients as young as 12 years.^{27,28} Specific data on the combination use of adapalene 0.1% and benzoyl peroxide 2.5% in adolescents with skin of color is lacking; however, in my experience, efficacy and side effects are similar to those reported for adapalene monotherapy. Comparison of adapalene gel 0.1% to tretinoin gel 0.025% in Asian patients demonstrated comparable efficacy but more irritation for the latter²⁹; however, in my experience newer formulations of both retinoids may be less irritating in all ethnic groups. In Asian patients, there is an increased propensity for mild adverse events associated with adapalene treatment in the first month (80% in Japanese vs 20%–30% in whites).³⁰

Topical Antibacterials

Benzoyl peroxide tolerability in individuals with skin of color has been described for combination treatment with clindamycin 1%–benzoyl peroxide 5% gel, and it seems that this combination is well tolerated. In a head-to-head study of Asian acne patients comparing treatment with adapalene 0.1% to combination treatment with clindamycin 1%–benzoyl peroxide 5% gel,

both were effective in reducing lesions with minimal irritation.³¹ A recent post hoc analysis showed superior efficacy and few side effects with combination therapy clindamycin 1% and benzoyl peroxide 5% in Hispanic patients 12 years and older.³²

Given the countless over-the-counter benzoyl peroxide (2.5%–10%) agents sold annually, it is likely that this product and salicylic acid ($\leq 2\%$) are extremely safe in all ethnic and racial groups; however, when sensitivity is noted, lower concentrations can be used, particularly washes, which can be paired with emollient usage. Avoidance of aggressive irritation may prevent hyperpigmentation, which may occasionally result from aggressive topical application of medicaments.

Other Agents for Acne

One area of concern regarding acne treatment has been the use of dapsona gel 5%, which aids in the clearance of inflammatory and noninflammatory acne and has been well studied in teenagers of various ethnicities, the majority being white but also including black, Hispanic, and Asian patients.^{33,34} Hematologic safety has been confirmed, even in individuals with glucose-6-phosphate dehydrogenase deficiency (≥ 12 years of age), when applying to the face, neck, and upper shoulders.³⁵ However, I would caution against off-label usage on large surface areas (eg, chest, back) for younger adolescents (aged 6–10 years) in at-risk ethnic groups (eg, black, Asian, Middle Eastern) without hematologic monitoring early on. Fortunately, acne in younger age groups usually is limited to the face.

Oral Antibiotics for Acne

Oral antibiotics can be helpful in the clearance of moderate to severe acne as well as acne that is unresponsive to multiple topical agents. Children requiring oral antibiotics who are younger than 9 years should be treated with oral erythromycin, while older adolescents can be treated with minocycline or doxycycline.^{19,20} When dyspigmentation is noted, the physician must differentiate between minocycline-induced hyperpigmentation and the exuberant pigmentary response that often occurs in black and Hispanic patients. Other side effects are primarily compliance related. Once-daily, slow-release oral agents and avoidance of photosensitizing agents are considerations in individuals with skin of color who may not comply with sun protection. Because lupus is more common in females of color, careful differentiation of drug-induced lupus from systemic lupus is required. Usage of shorter courses of oral minocycline (ie, < 6 months) may limit the risk for drug-induced lupus.³⁶

Agents for Dyspigmentation and Scarring

Sunscreen and retinoids may reduce the appearance of dyspigmentation in patients with skin of color. Another agent that has been shown to be efficacious in treating dyspigmentation in individuals with skin of color is azelaic acid gel 15%, which has been noted to reduce dyspigmentation in black adults.³⁷ Daily application of hydroquinone 4% cream or gel for 6 weeks has been used to treat dyspigmentation in acne patients 13 years and older. The difficulty of using this product in teenagers is the lack of consistent response and difficulty integrating an extra agent into their daily routine. Younger adolescents may find the products irritating and can start off with hydroquinone 2% products to test their tolerance.³⁸

Isotretinoin has been described as a therapeutic option for treatment of severe acne in individuals with skin of color. A recent retrospective study looked at the safety and efficacy of isotretinoin in Asian patients.³⁹ In this review from Singapore, the authors identified 2255 patients with a mean age of 22.5 years and a 2.5:1 ratio of males to females, with 82.3% identified as Chinese. The authors described a mean starting dose of 0.4 mg/kg with a mean dose of 0.5 mg/kg for 7.8 months. Substantial improvement or complete remission was achieved by 93.9% of patients.³⁹ Because Asian patients have the most sensitive facial skin of all other skin types and ethnicities, it may be suggested that all ethnic and racial groups may tolerate the medication. One limitation of isotretinoin use in minority patients is the cost. Another issue is pregnancy prevention in women and strict requirements to utilize 2 forms of contraception even when patients deny sexual activity.⁴⁰

Cosmetic procedures for acne scarring should be used with caution in patients with the darkest skin types. The most cosmetically beneficial agent often is tincture of time, followed closely by intralesional triamcinolone acetonide at a low concentration (2–2.5 mg/mL) for hypertrophic or cystic lesions and higher concentrations for keloidal scarring. Warning of potential hypopigmentation is necessary, though it is not likely to occur with a low concentration.

Salicylic acid or low-strength glycolic acid peels also may be beneficial; however, use of chemical peels in patients younger than 12 years often is limited by the patient's ability to sit still as well as the potential for more side effects than in older patients with thicker skin. Consequently, short application times (2–3 minutes) and low concentrations of salicylic or glycolic acids are most reasonable for initial chemical peels.²² Avoid use of chemical peels in individuals with unrealistic expectations, a family or personal history of excessive dyspigmentation

and/or scarring, and the inability to tolerate downtime from school or sports. Avoid allowing parents and/or guardians to push procedures on children who are not willing participants; often, patients wish to proceed with chemical peels prior to major events such as proms, graduations, or sweet 16s/quinceañeras. These patients often are motivated and compliant with the prescribed skin care regimen, but in the end, children may still not comply with holding still or skin care regimens. Therefore, parental supervision is helpful for posttreatment skin care in adolescent acne patients with skin of color. A lead time of at least 2 weeks is advisable in the event of an intense response, which one occasionally sees in the youngest patients (12–13 years of age).

Other cosmetic procedures are beyond the scope of this article and should be handled by dermatologists familiar with the therapy based on the patient's skin type and race or ethnicity. Caution is recommended to avoid using aggressive procedures in young patients. Consideration for the use of lasers in black patients include the risks for scarring and dyspigmentation, even with lasers that typically are associated with a low risk for scarring, such as the pulsed dye laser.⁴¹

Conclusion

Acne in adolescents with skin of color requires consideration of the patient's skin type, family history, and presentation. Issues of style and skin care, overall health, sexual maturation, and use of cosmetics can affect disease appearance and severity. Usage of topical agents and oral medicaments can be effective in achieving clearance of acne lesions, and cosmetic procedures should be conducted with caution in young, dark-skinned patients. Ultimately, the prevention of scarring can be achieved in most patients when therapy is paired with an appropriate skin care regimen.

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