Ethnicity and Aging Skin

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ABSTRACT

Aging is a complex process influenced by both extrinsic and intrinsic factors. Premature signs of aging due to cumulative UV exposure represent a major concern of the cosmetic patient. Skin of color is less susceptible to photodamage and thus signs of aging are less pronounced and occur later than in Caucasians. Understanding structural and functional differences among different racial/ethnic groups is important to achieve favorable treatment outcomes when addressing aging concerns.

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INTRODUCTION

Skin aging is a complex phenomenon influenced by extrinsic and intrinsic factors. Variations in age of onset, severity, and specific concerns are observed across the spectrum of racial/ethnic populations. According to the US Census Bureau Projections, by 2044 more than half of the United States (US) is projected to belong to a non-white racial and ethnic group.[1] As the minority population continues to grow, minorities represent an expanding cohort seeking cosmetic procedures. As such, understanding structural and functional differences of the skin and aging process in different skin types is of increasing importance.

Structural and Functional Differences

Darkly pigmented skin is characterized by larger, more numerous melanosomes that contain more melanin and are more singly dispersed throughout the epidermis compared to lightly pigmented skin. The increased melanin content and widely dispersed melanosomes in darker skin provide photoprotection.[2] In a 1979 study by Kaidbey et al using cadaveric skin, the mean protective factor from Ultraviolet (UV) B radiation in black skin was found to be 13.4 compared to 3.4 for white skin; and the mean rate of UVB transmission into the dermis was 5.7% in black skin compared to 29.4% in white skin.[3] While increased melanin is advantageous in delaying the onset and/or reducing the severity of photoaging in darker skin, labile melanocyte responses contribute to a greater risk of pigment alteration - a feature of both photoaging and a common sequela of inflammation and injury.[4]

There are also structural differences in the dermis and epidermis that can potentially influence variations in aging. Notwithstanding inherent limitations of limited studies with small sample sizes, the stratum corneum in black skin (compared to white skin) has been reported to have more layers that are arranged more compactly.[2,5] Additionally, fibroblasts have been reported to be larger, more numerous, and more frequently binucleated or multinucleated in black skin vs white skin, generating compact collagen bundles that are arranged more parallel to the epidermis.[2,5] The heightened fibroblast activity is thought to contribute to the lower incidence of facial rhytides, but increased risk of keloids in black skin and other darker skin types.

Aging

In general, signs of aging occur at a later age and are less pronounced in ethnic skin. Facial wrinkles and fine lines appear later in African Americans than in Caucasians and may not appear until late in the fifth or sixth decade.[4] In a multinational, cross-sectional, web-based survey study assessing ten facial features of aging across different racial/ethnic groups and Fitzpatrick types, white women self-reported more signs of moderate and severe facial aging than Asian and Hispanic women beginning in the fourth decade.[6] In more than 30% of study participants aged 40-49, white individuals reported to have forehead lines, glabellar lines, crow's feet, nasolabial folds, and puffiness under the eyes, in contrast to the presence of nasolabial folds and puffiness reported by Asian women and nasolabial folds in Hispanic women.[6] In this study, black women did not describe signs of facial aging until the fifth decade and these were limited to nasolabial folds and forehead lines.[6] When comparing the severity of facial features against photonumeric rating scales, the mean severity of crow's feet lines were most severe in Fitzpatrick skin type I and least severe in Fitzpatrick skin types IV and V.[6]

Hyperpigmentation and uneven skin tone are of greater concern in individuals with skin of color compared to patients with lighter skin types, among whom fine lines and wrinkles are more frequent concerns. Patients with skin of color are additionally more prone to develop and become preoccupied with the ac-

quisition of benign facial neoplasms, textural irregularities, and intrinsic structural changes. Moreover, there are facial structural differences among different ethnic groups that influence the aging process. In Figures 1a and 1b, Alexis and Alam highlight the differences in facial architecture of aged Caucasian, African American, Latino, and Asian women from frontal and lateral views.[7] While wide individual variability within populations is expected and broad generalizations about specific population groups should be used with caution, nuances in facial anatomic structure and manifestations of skin aging have been described in published studies.

African Americans and Aging

Skin aging among African Americans tends to be most striking in the midface. Published descriptions of common facial anatomic features among African Americans include a hypoplastic malar eminence, increased soft tissue in the midface, and more ocular proptosis.[7,8] With aging, the malar fat pads descend toward the nasolabial folds resulting in lengthening of the lower eyelids, more pronounced nasolabial folds, and accentuated nasal jugal folds (Figure 2).[7,8] These changes ultimately lead to a double convexity of the midface. Additionally, dermatochalasis of the upper lid is often seen, which can be attributed to pseudoherniation of the medial orbital fat pad into an eyelid space that is on average smaller in African Americans than Caucasians. Mattory and colleagues found that the distance between the upper eyelid crease and lid margin is 6 to 8 mm in African Americans compared to 8 to 10 mm in Caucasians.[9] These anatomic differences in combination with increased ocular proptosis also contribute to the presence of infraorbital shadowing.[8]

Perioral rhytides and loss of lip volume are prominent changes with aging seen in Caucasians that are less common, of lower severity, and delayed in onset among African Americans.

Dermatosis papulosa nigra (DPN) is a common facial neoplasm and sign of aging in black individuals. Lesions are 1- to 3-mm flat or pedunculated papules. Although benign, they represent a frequent cosmetic concern in black patients.

Asians and Aging

Cutaneous manifestations of photoaging in the Asian population are well documented in the literature. In East and Southeast Asians, pigmentary changes predominate. These changes include actinic lentigines, pigmented seborrheic keratoses, and

FIGURE 1. Features of facial aging in Caucasian, African American, Latino, and Asian women, from left to right. (A) frontal view (B) lateral view.
Reproduced with permission from Alexis AF, Alam M. Racial and ethnic differences in skin aging: implication for treatment with soft tissue fillers. *J Drugs Dermatol.* 2012;11(suppl 8):s30-s32.

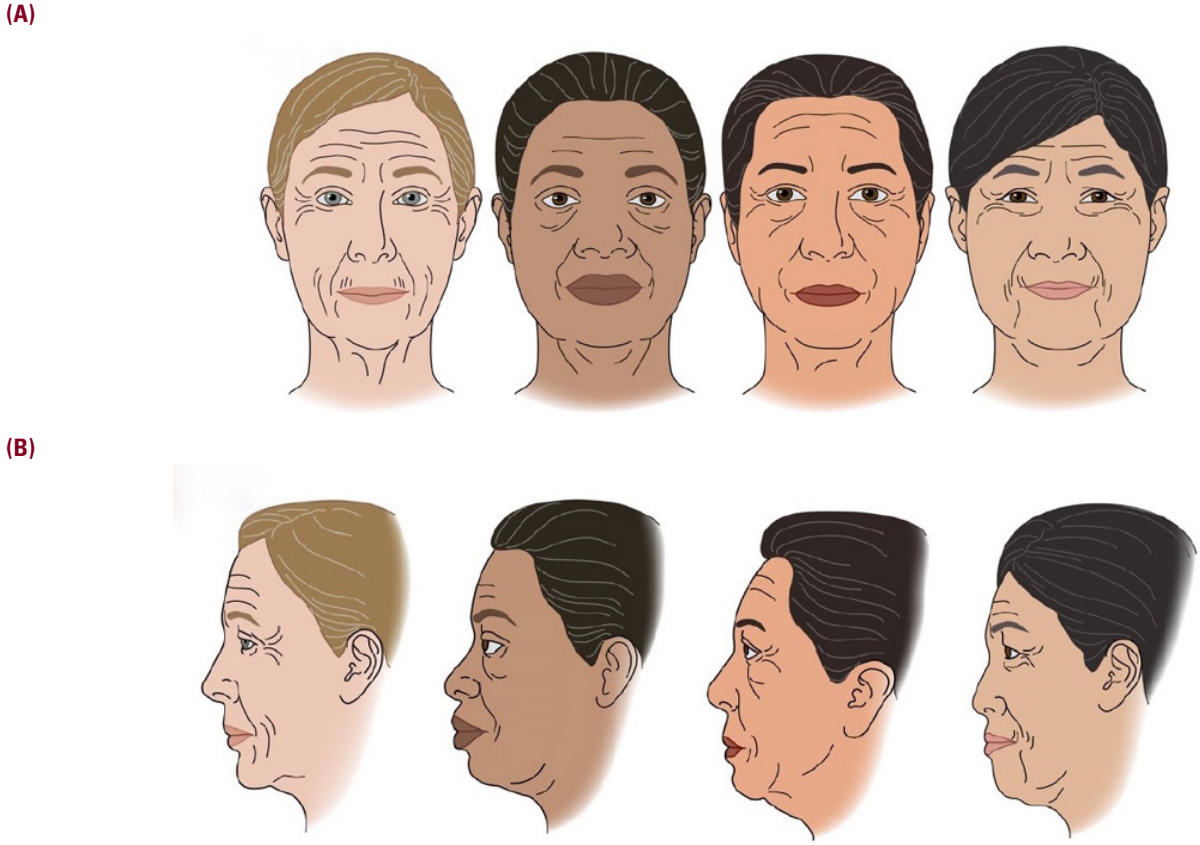
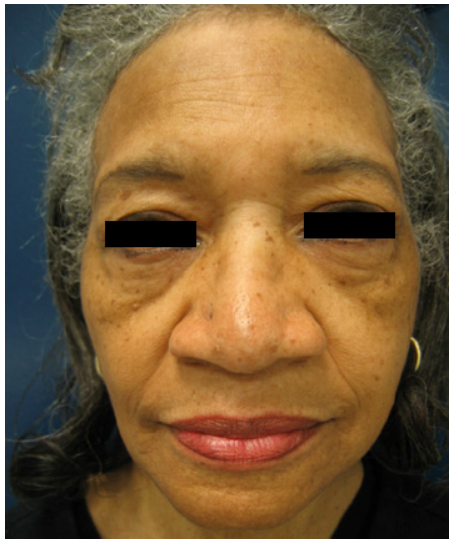


FIGURE 2. A 74-year-old African American woman with characteristic signs of facial aging.
Reproduced with permission from Alexis AF, Alam M. Racial and ethnic differences in skin aging: implication for treatment with soft tissue fillers. *J Drugs Dermatol.* 2012;11(suppl 8):s30-s32.



mottled hyperpigmentation. In a study comparing Chinese and French age-matched women, wrinkle onset was delayed by 10 years in Chinese women compared to French women, however Chinese subjects were found to have an increased frequency of pigmented spots on the face and hands.[10]

In Koreans, the development of lentigines increases with age and is more common in women. Conversely, the appearance of seborrheic keratoses (SKs) increases with age and is more common in Korean men.[11,12] In a study by Kwon et al, pigmented seborrheic keratoses were greater number and larger in size in chronically sun exposed skin compared to sun protected or intermittently sun exposed skin.[11]

Although many authors suggest that pigment alterations are the most prominent signs of aging in Asians, skin wrinkling remains a significant but late feature. Skin wrinkling may not become visibly apparent in Asians until age 50, however, using an author developed 7-point photographic wrinkle scale in Koreans, Chung concluded that Asians have coarser, thicker, and deeper rhytides on the forehead, perioral, and Crow's feet.[12] In contrast, Caucasians tend to have fine rhytides on the cheeks and Crow's feet area. The mechanism of these differences is unknown.

Hispanic and Aging

Aging in Hispanics and/or Latinos is not well characterized; generalizations are confounded by the broad range of skin types and ancestry in this population. Skin mottling, jowl formation, infraorbital hollowness, and shadowing have been described as leading concerns in this population.[9,13]

While great diversity exists, common anatomic features among Hispanic/Latino populations that have been described in the published literature include a broad face, prominent malar eminence, and small nose with overlying thick skin.[14] They are described to have more sebaceous skin than Caucasian women and heavy eyelids.[14] With aging, these features become more pronounced. The midface becomes thicker and heavier with fat pad accumulation contributing to more pronounced nasolabial folds.[7,14] Additionally, eyebrows droop (especially laterally), eyelid hooding becomes more prominent and the lower lid fat pad herniates.[14] And similar to the midface, the skin in the neck area appears thick, heavy, and loose.[14]

Approach to Cosmetic Procedures in Aging Ethnic Skin

The goal of cosmetic procedures in skin of color is to achieve maximal results while minimizing epidermal and dermal injury. The risk of post inflammatory pigment alteration and scarring should be considered when performing any procedure on darker skin types.

Botulinum toxin is the leading nonsurgical cosmetic procedure performed in the United States. To date, the studies on botulinum toxin in different ethnic groups have established botulinum toxin to be both safe and effective for the correction of facial rhytides. Although it is most frequently used for the correction of facial rhytides, there are ethnic variations in aesthetic concerns that influence its' use. In East Asian populations, especially Koreans, botulinum toxin is a popular procedure to contour the jaw. Benign hypertrophy of the masseter muscle is common in East Asians, which contributes to a wider lower third of the face compared to Caucasians. The square jaw appearance is often undesirable in this population, leading to a high demand for correction. Using ultrasonography in a sample of 121 Korean patients, Kim et al demonstrated that botulinum toxin is effective in the reducing the thickness of the masseter muscle.[15]

Attention to anatomical differences and nuances in aesthetic concerns is also important in the use of soft tissue filler. In Asian patients, the approach to dermal fillers to correct age-related structural defects requires understanding of this ethnic group's desire for an oval facial shape. The bizygomatic distance in most Asians is wider than that of whites, thus it is important to avoid the volumization of the lateral maxilla and zygoma as one would consider in other racial groups in order to avoid further widening of the midface.[16] Volumization of the medial half of the maxilla and alar base can achieve anterior projection of the central third of the face and reduce infraorbital and perialar shadowing.[16] The practice of combining dermal fillers to midface and neuromodulators to the masseter muscle can achieve fullness in the upper half of the face and a narrow lower face, effectively reshaping an undesirable square shape into a preferred ovoid shape.[16]

In African Americans, soft tissue augmentation is unique with respect to the goal of correcting structural age-related changes that are specific to this population. Histologically, there is less thinning of collagen bundles and elastic tissue in black skin. Thus in contrast to the need to treat superficial creases common in photoaged Caucasian skin, volume restoration in African Americans focuses largely on correcting the previously described prominent midfacial fat atrophy and soft tissue redistribution.[17] Authors Burgess and Awosika suggest that stimulatory fillers that produce ongoing reactions that contribute to volumizing (calcium hydroxylapatite and poly-L-lactic acid) may be more effective in this population.[17] While there are few randomized controlled studies evaluating the safety and efficacy of dermal fillers in skin of color, the literature to date supports their use in darker skin types. In a study by Taylor et al, variable-particle hyaluronic acid dermal fillers were shown to be well tolerated and 93% effective in the correction of nasolabial folds at 12 weeks in 150 patients with Fitzpatrick skin types IV, V, and VI.[18]

However, as with any cosmetic procedure performed in skin of color, it is important to consider the risk of post inflammatory hyperpigmentation and scarring. Taylor et al reported the most common adverse effect after the injection of variable particle hyaluronic acid fillers was mild or moderate hyperpigmentation (17 of 150 patients), which resolved within 12 weeks for all but 3 patients wherein the pigmentation persisted for greater than 12 weeks.[18] The majority of cases of hyperpigmentation were associated with multiple puncture techniques (13%) compared to linear threading (2%).[18] As such, in darker skin types, the threading and fanning technique may be preferred over multiple punctures to decrease the risk of hyperpigmentation.

CONCLUSION

The population seeking anti-aging cosmetic procedures is becoming increasingly diverse. For safety reasons, more conservative approaches are generally recommended for darker skin types. Pre- and post-treatment precautions should be considered, such as prophylactic use of bleaching agents, post-procedure topical steroids, sunscreen, and sun avoidance. Lastly, achieving optimal treatment outcomes requires an individualized approach tailored to each patient. Understanding individual variations in anatomy, treatment expectations, and risks is paramount to achieving successful outcomes.

DISCLOSURES

Dr. Obioha has no relevant financial relationships or potential conflicts of interests. Dr. Alexis has served as an advisory board member for L'Oréal, Allergan, and Galderma.

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