Differences in the Stratum Corneum Barrier

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Despite a growing worldwide population, there is still limited data on the physiology and structural differences in ethnic skin. Although the increased presence of melanin in skin of color confers a photoprotective effect, there are various differences in the stratum corneum that will influence skin physiology in different racial groups.

Barrier function of the skin depends on the structure of the corneocytes, lipid content, and transepidermal water loss.

Compared to white skin, black skin has more corneocyte layers and a more compact stratum corneum with greater intercellular cohesiveness (Semin. Cutan. Med. Surg. 2009;28:115-29). The epidermal barrier in darker skin has been shown to be stronger when exposed to mechanical or chemical challenge. Although the size of the individual corneocytes is the same in black and white skin, the desquamation rate in certain locations is higher in black skin. This is likely because of increased desquamatory enzyme levels, such as cathepsin L2 in the lamellar granules of darker pigmented individuals, leading to an "ashy" manifestation.

Black skin has the highest sebum content of all ethnicities but also the lowest ceramide level, and is, therefore, the most susceptible to transepidermal water loss and xerosis of the skin, when compared with other ethnic groups.

Asian skin has similar corneocyte architecture and transepidermal water loss when compared to white skin, but has decreased corneocyte cohesion, and, thus, a weaker barrier function when exposed to mechanical and chemical stimuli. Compared to white and black patients, Asian patients have the highest amount of ceramides and the least amount of transepidermal water loss.

Although no large, multiethnic group studies have been performed looking at all of the skin barrier physiologic properties and their relation to clinical signs of disease, several small studies do shed light on some of the ethnic variations in skin barrier function. In clinical practice, these small variations should play a role in ethnic-specific treatment regimens for common conditions, such as acne and atop dermatitis.

In my practice, black patients with acne often have a high sebum content but cannot tolerate drying medications such as benzoyl peroxide. These patients often present with ashy, dry skin in certain areas and oily acne-prone skin in other areas, leading to more complex skin care regimens. Understanding these
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concepts can help tailor skin treatments for ethnic patients.

- Lily Talakoub, M.D.

Do you have questions about treating patients with darker skin? If so, send them to sknews@elsevier.com.

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