Treating pigmented lesions in patients with darker skin types can be clinically challenging due to the relatively lower incidence of pigmented lesions in this patient population. This article will review the biology of pigmentation and offer further clinical insight into pigmented lesions in darker skin types.

**BIOLOGY OF PIGMENTATION**

Skin pigmentation is determined at the cellular level. Although there may be some variation in the number of melanocytes between races, this difference is not striking. There are approximately 2,000 epidermal melanocytes/mm² on the head and forearm and 1,000 epidermal melanocytes/mm² on the rest of the body. These differences are present at birth. Thus, all persons have the same total number of melanocytes. It is the distribution of melanosomes in the keratinocytes that correlates with skin color. In white skin, melanosomes are small and aggregated in complexes. In black skin, melanosomes are large and singly distributed within keratinocytes.

Interestingly, melanosome distribution closely correlates with variations in skin color within an individual. For example, keratinocytes from the thighs of black patients demonstrate individually separated melanosomes, while keratinocytes from the lighter palmar surfaces of the same patients have complexed melanosomes. In contrast, in white patients, keratinocytes of both the volar and thigh skin demonstrate complexed melanosomes. This finding further supports the theory that skin color correlates with the distribution of melanosomes, since the melanosomes in the light volar skin of black patients closely resembles the melanosomes of white patients.

**NEVI**

There are racial differences in the incidence and distribution of nevi in black and white patients. Studies of nevi in white patients range from an average of 14.6 to 61 nevi per patient. Studies of nevi in black patients range from 2.0 to 11 nevi per patient. Studies of nevi in Asian patients range from 2.5 to 16.1 nevi per patient. Overall, nevi are less common in darker-skinned patients than in lighter-skinned patients.

Interestingly, even within the darker-skinned populations, the number of nevi per subject differs. A study of black subjects in New Orleans further subdivided the subjects into fair, light brown and dark brown groups. The authors reported more total body nevi in lighter black patients when compared to darker black patients. This finding was different from a prior study that did not demonstrate any variation in number of nevi within the black population. The differences between the two studies may be accounted for by a larger number of patients in the New Orleans study and also, perhaps, a greater local variation in skin color in the New Orleans study population. Another study in the Netherlands also demonstrated a steady decline in the median number of moles from fair skin to darker skin complexions.

Finally, a study in Korean patients demonstrated an inverse relationship between number of nevi and Fitzpatrick skin phenotype. From this data, it appears that as
skin color increases, the total number of nevi on the body decreases.

The authors of the New Orleans study also examined the location of nevi on the body in the fair, light brown and dark brown groups. This study revealed another interesting variation within the black population. They found a greater number of palmar-plantar nevi in darker black patients compared to lighter black patients. Similarly, mottled pigmentation of the palms and soles was more frequent in the darker black patients. This data suggests that darker black patients have a greater number of acral melanocytic lesions when compared to lighter-skinned black patients. Histologically, these acral melanocytic lesions were more often lentigo simplex. The average number of nevi on the palms and soles in the New Orleans black patients was 0.3 nevi. A study of 500 Nigerian healthy adults reported an average of 1 to 3 nevi per patient on the palms.

Acral melanocytic lesions in the black population are of special interest since this is the most common site of melanoma in black patients. In addition, clinical differentiation between acral lentigos and acral lentiginous melanoma can be challenging in darker-skinned patients.

**MELANOMA**

The annual incidence of melanoma in black patients ranges from 0.5 to 1.1 per 100,000 compared to 2 to 17 per 100,000 in white patients. Malignant melanomas are divided into four subtypes including nodular, superficial spreading, lentigo maligna, and acral lentiginous melanoma. Acral lentiginous melanoma is the most common subtype of melanoma in black patients. Melanoma can also be categorized by its location on the body. There have been suggestions that plantar melanoma, regardless of subtype, is more common in black patients than in white patients. In fact, the incidence of plantar melanoma is equal among the races. However, in black patients with melanoma, the plantar and palmar surfaces are the most frequent location. In a study of 204 melanomas in black Africans, 86% presented on the palmar or plantar skin. Subungal melanomas also represent a common presentation of melanoma in black patients. Nonacral cutaneous sites for melanoma are less common in black patients, making the overall incidence of melanoma in black patients lower than in white patients.

Mucosal melanomas are another common presentation of melanoma in black patients. These can occur on mucosal surfaces such as the oral, vulvar and anorectal mucosa. In contrast to cutaneous melanomas, these melanomas typically present later in life, after 60 years of age. Although the incidence of melanoma is lower in black patients, melanoma is associated with increased morbidity and mortality in the black population. The California Cancer registry reported a 5-year survival rate for black patients of 70% compared to a survival rate of 87% for white patients. Another study examining melanoma survival rates at Washington Hospital Center found a 5-year survival rate in African-Americans of 58.8% compared to 84.8% in Caucasian patients. Black patients were
less likely to present with in situ/stage I disease than white patients (39.3% vs. 60.4%). Furthermore, black patients were more likely to present with stage III/IV disease than white patients (32.1% vs. 12.7%).19 Delayed diagnosis and treatment in black patients may explain the large disparity in survival rates observed between these two groups. Public education regarding skin cancer risk offers a potential area of intervention to improve skin cancer survival of all types in black patients.20

OTHER NEOPLASMS OF THE SKIN

Nonmelanoma skin cancers frequently present as a pigmented lesion in darker-skinned patients. Most black patients with basal cell carcinoma present with hyperpigmented, translucent nodules on the head and neck.21 Similarly, squamous cell carcinoma (SCC) can present as a hyperpigmented plaque in black patients and can be confused with melanoma. SCC is the most common skin cancer in individuals of African descent. SCC in African Americans can occur anywhere on the body, but the lower legs are the most common location.22,23

SUMMARY

In summary, there are many unique characteristics of melanocytic lesions in skin of color. In darkly pigmented subjects, the number of total body nevi appears to decrease with skin color, while the presence of palmar-plantar nevi increases with skin color. The latter observation may explain why the palm and plantar surfaces are the most frequent location of melanoma in black patients. It is also important to note that other skin neoplasms frequently present as pigmented lesions in darker-skinned patients. Basal cell carcinoma and, especially, SCC can be confused with melanoma due to their unique presentation in darker skin types. The unique features of pigmented lesions in darker skin types should be considered when examining and treating patients of darker racial ethnic groups.

Dr. Woolery-Lloyd serves as the Director of Ethnic Skin Care at the University of Miami Cosmetic Center, with a particular interest in ethnic skin disease, including pigmentation disorders and keloids. She also specializes in lasers in ethnic skin.

References


DISCLOSURE: Dr Woolery-Lloyd has no conflict of interest with any material presented in this month’s column.

TABLE 1

COMPARISON OF DISTRIBUTION OF NEVI IN WHITE, BLACK AND ASIAN PATIENTS

<table>
<thead>
<tr>
<th>Author</th>
<th>White Patients</th>
<th>Black Patients</th>
<th>Asian Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Packé</td>
<td>Rampené</td>
<td>Kimé</td>
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<tr>
<td>Year</td>
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<td>The Netherlands</td>
<td>Korea</td>
</tr>
<tr>
<td>Number of patients</td>
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<td>2004</td>
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</tr>
<tr>
<td>Average nevi per patient</td>
<td>16.1</td>
<td>16.1</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Note: The numbers for each category are approximate and may vary.