Melanoma in Skin of Color

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The early detection and diagnosis of melanoma is of paramount importance to dermatologists because skin cancers detected at an early stage are associated with reduced morbidity and mortality compared to those detected at later stages. Among black individuals and Hispanics, detection of melanoma often is delayed,[1] which can lead to poorer prognoses and worse outcomes compared to the non-Hispanic white population. Potential contributing factors such as decreased access to care, fewer preventative measures, and public/medical misconceptions about who is affected by skin cancer have yet to be fully elucidated.

Melanoma Incidence

Melanoma is the most deadly and third most common skin cancer in all ethnic groups. It represents 1% to 8% of all skin cancers in black individuals, 10% to 15% of all skin cancers in Asian Indians, and 12% to 19% of all skin cancers in Japanese.[2] The age-adjusted incidence rates (per 100,000) for melanoma are estimated at 4.5 among Hispanics and 1.0 among black individuals.[3] Bergfelt et al[4] reported that the incidence of melanoma (per 100,000) among New Mexico Hispanics with lighter skin phototypes (1.5 in males; 2.9 in females) was higher than Puerto Ricans with darker phototypes (1.3 in males; 1.3 in females). The incidence of melanoma among Asians is comparable to black individuals, ranging from 0.5 to 1.5 per 100,000 in males and females.[5] Among the population in Singapore, Koh et al[6] found that Chinese patients with lighter skin phototypes demonstrated a higher rate (0.5 per 100,000) of melanoma than Indian patients with darker phototypes (0.2 per 100,000).

It is estimated that patients with skin of color are 1.96 to 3.01 times more likely to die from melanoma than age- and sex-matched white patients. From 1996 to 2004, the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program reported 5-year melanoma survival rates that ranged from a high of 93.5% among white women to a low of 71.2% among black men.[7]

The lifetime risk for developing melanoma in white individuals is estimated at 1 in 50 compared to 1 in 1000 in black individuals. Alarmingly, invasive melanoma rates have markedly increased among Hispanics in California since 1988; a 1.8% per year increase in the incidence of invasive melanomas was reported among Hispanic males from 1988 to 2001, with a 7.3% annual increase reported from 1996 to 2001.[8]

Risk Factors

There are multiple documented risk factors for melanoma, including intermittent exposure to high doses of UV radiation (UVR), chronic cumulative dosages of UVR, an increased number of nevi as well as dysplastic nevi, family history of melanoma, Fitzpatrick skin type I, light eye color, and blonde or red hair. Although all of these risk factors apply to white patients, not all of them apply to patients with skin of color. For instance, there are conflicting data on whether or not UVR exposure is a significant risk factor for melanoma in patients with skin of color who tend to develop melanoma in non–sun-exposed sites such as the palmar, plantar, and mucosal surfaces.[9]

Hu et al[10] analyzed 6 US cancer registries and found higher incidences of melanoma in black individuals and Hispanics of both sexes residing at lower latitudes and higher UV indexes; however, this correlation was statistically significant only in white men, white women, and black men ($P=.01$). In a 2005 study, Eide and Weinstock[11] evaluated SEER data from 1992 to 2001 and found no significant association between UVR exposure and the incidence of malignant melanoma in black, Hispanic, Asian/Pacific Islander, and Native American populations in the United States. The study, which included the 11 US cancer registries that make up the SEER 11 registries, revealed that melanoma incidence was associated with lower latitude and increased UV index only in non-Hispanic white individuals.[11]

Curtin et al[12] studied the molecular cytogenetics of various melanomas and found that acral and mucosal

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melanomas were uniquely characterized by a higher frequency of focal amplifications and gene losses compared to melanomas from chronically and intermittently sun-exposed skin. Acral and mucosal malignant melanomas as well as those that appear in areas of chronic sun damage had a lower frequency of v-raf murine sarcoma viral oncogene homolog B1 gene (*BRAF*) mutations than melanomas that arise in areas intermittently exposed to the sun (eg, trunk, arms, and legs).[12]

Additional risk factors for melanoma in black individuals include albinism; trauma; burn scars; radiation therapy; immunosuppression; and preexisting pigmented lesions, especially on acral and mucosal regions.[13] Coleman et al[14] suggested that more than 90% of black individuals have at least 1 nevus. Melanocytic nevi in black individuals are predominantly acral, which may correspond with the high proportion of acral melanoma in black individuals.[15] A family history of melanoma does not appear to be a major predisposing factor in black patients the way it is in white patients.[16]

Melanoma Presentation

In black individuals, Asians, Filipinos, Indonesians, and Native Hawaiians, melanomas appear most frequently in non–sun-exposed skin areas.[17] Mucous membranes and acral areas are the most common sites of melanoma in patients with skin of color. Sixty percent to 75% of tumors arise on the palms, soles, mucosal locations, and subungual regions.[18] Collins[19] reported that 25% to 50% of malignancies developed within prior pigmented lesions, and oral melanomas represented approximately 7.5% of all melanomas in Asians with two-thirds of these tumors originating from oral melanosis.

Although the incidence of acral melanoma is similar among white individuals and patients with skin of color, acral melanomas constitute the greatest proportion of melanomas in nonwhite populations.[20] Subungual melanomas also are a concern for darker skin phototypes. Levit et al[21] proposed the ABCDEF rule for clinical detection of subungual melanomas: A denotes age, with peak incidence in the 5th to 7th decades of life, and black individuals, Asians, and Native Americans in whom subungual melanoma accounts for up to one-third of all melanoma cases; B corresponds with brown to black with a breadth of 3 mm or more and variegated borders; C stands for any change in size, color, or nail morphology; D stands for digital location, with the hallux and index finger being more common; E represents extension of the pigment onto the proximal and/or lateral nail fold or free edge of the nail plate; and F indicates a family or personal history of dysplastic nevi or malignant melanoma.

Hispanics and black individuals tend to present with thicker, more advanced tumors and thus tend to have poorer prognoses with higher mortality rates compared to white patients.[22] Cockburn et al[23] conducted a review of California melanoma cases and reported that the incidence of tumors thicker than 1.5 mm at presentation increased at a rate of 11.6% and 8.9% per year among Hispanic males and females, respectively. In another analysis, acral lentiginous melanoma had 5- and 10-year melanoma-specific survival rates of 80.3% and 67.5%, respectively, which were less than the overall rates for cutaneous malignant melanomas (91.3% and 87.5%, respectively; $P<.001$). The 5- and 10-year melanoma-specific survival rates were highest in non-Hispanic white individuals (82.6% and 69.4%, respectively), intermediate in black individuals (77.2% and 71.5%, respectively), and lowest in Hispanic white individuals (72.8% and 57.3%, respectively) and Asian/Pacific Islanders (70.2% and 54.1%, respectively).[24]

Hu et al[25] conducted a retrospective review of case reports from the Florida Cancer Data System (N=1690). The authors revealed that higher-stage melanomas were more common among Hispanic (26%) and black patients (52%) compared to white patients (16%).[25] Byrd et al[26] reviewed a total of 649 cases of melanoma in black and white patients at the Washington Hospital Center, Washington, DC, from 1981 to 2000; 36 (5.5%) patients were black. The authors reported that black patients were more likely to present with stage III and stage IV disease (32.1%) compared to white patients (12.7%), and white patients were more likely to present with melanoma in situ and stage I disease (60.4%) than black patients (39.3%).[26]

Survival Rates

After adjustments for age, sex, histology, stage, anatomic site, treatment, and socioeconomic status, Zell et al[27] reported a statistically significant increase in the risk for death from melanoma among black patients compared to white patients, which suggests that poor survival rates for black patients with melanoma are not caused by socioeconomic differences alone. Although multiple factors may contribute to this observation, more attention must be dedicated to preventative measures in skin of color populations.

Summary

The etiology and pathogenesis of melanoma are multifactorial and represent a concern for all individuals, regardless of skin pigmentation and phototype. It is of major concern that patients with skin of color are presenting with more advanced melanomas and delayed diagnoses,

leading to a poorer overall prognosis and increased morbidity and mortality. Given the tendency for melanomas to develop on the palms, soles, and mucous membranes in darkly pigmented patients, it is paramount that these anatomic locations are examined thoroughly during skin examinations. Efforts to raise public awareness of the potential for melanomas to arise in non–sun-exposed areas also are necessary to assist in early detection.

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