Pediatric Melanoma Outcomes by Race and Socioeconomic Factors

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PRACTICE **POINTS**

- Pediatric melanoma is a unique clinical entity with a different clinical presentation than in adults.
- Thicker tumors and disseminated disease are associated with a worse prognosis, and these factors are more commonly seen in Black and Hispanic patients.

To the Editor:

Skin cancers are extremely common worldwide. Malignant melanomas comprise approximately 1 in 5 of these cancers. Exposure to UV radiation is postulated to be responsible for a global rise in melanoma cases over the past 50 years.[1] Pediatric melanoma is a particularly rare condition that affects approximately 6 in every 1 million children.[2] Melanoma incidence in children ranges by age, increasing by approximately 10-fold from age 1 to 4 years to age 15 to 19 years. Tumor ulceration is a feature more commonly seen among children younger than 10 years and is associated with worse outcomes. Tumor thickness and ulceration strongly predict sentinel lymph node metastases among children, which also is associated with a poor prognosis.[3]

A recent study evaluating stage IV melanoma survival rates in adolescents and young adults (AYAs) vs older adults found that survival is much worse among AYAs. Thicker tumors and public health insurance also were associated with worse survival rates for AYAs, while early detection was associated with better survival rates.[4]

Health disparities and their role in the prognosis of pediatric melanoma is another important factor. One study analyzed this relationship at the state level using Texas Cancer Registry data (1995-2009).[5] Patients' socioeconomic status (SES) and driving distance to the nearest pediatric cancer care center were included in the analysis. Hispanic children were found to be 3 times more likely to present with advanced disease than non-Hispanic White children. Although SES and distance to the nearest treatment center were not found to affect the melanoma stage at presentation, Hispanic ethnicity or being in the lowest SES quartile were correlated with a higher mortality risk.[5]

When considering specific subtypes of melanoma, acral lentiginous melanoma (ALM) is known to develop in patients with skin of color. A 2023 study by Holman et al[6] reported that the percentage of melanomas that were ALMs ranged from 0.8% in non-Hispanic White individuals to 19.1% in Hispanic Black, American Indian/Alaska Native, and Asian/Pacific Islander individuals. However, ALM is rare in children. In a pooled cohort study with patient information retrieved from the nationwide Dutch Pathology Registry, only 1 child and 1 adolescent were found to have ALM across a total of 514 patients.[7] We sought to analyze pediatric melanoma outcomes based on race and other barriers to appropriate care.

We conducted a search of the Surveillance, Epidemiology, and End Results (SEER) database from January 1995 to December 2016 for patients aged 21 years and younger with a primary melanoma diagnosis. The primary outcome was the 5-year survival rate. County-level SES variables were used to calculate a prosperity index. Kaplan-Meier analysis and Cox proportional hazards

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model were used to compare 5-year survival rates among the different racial/ethnic groups.

A sample of 2742 patients was identified during the study period and followed for 5 years. Eighty-two percent were White, 6% Hispanic, 2% Asian, 1% Black, and 5% classified as other/unknown race (data were missing for 4%). The cohort was predominantly female (61%). White patients were more likely to present with localized disease than any other race/ethnicity (83% vs 65% in Hispanic, 60% in Asian/Pacific Islander, and 45% in Black patients [$P<.05$]).

Black and Hispanic patients had the worst 5-year survival rates on bivariate analysis. On multivariate analysis, this finding remained significant for Hispanic patients when compared with White patients (hazard ratio, 2.37 [$P<.05$]). Increasing age, male sex, advanced stage at diagnosis, and failure to receive surgery were associated with increased odds of mortality.

Patients with regionalized and disseminated disease had increased odds of mortality (6.16 and 64.45, respectively; $P<.05$) compared with patients with localized disease. Socioeconomic status and urbanization were not found to influence 5-year survival rates.

Pediatric melanoma often presents a clinical challenge with special considerations. Pediatric-specific predisposing risk factors for melanoma and an atypical clinical presentation are some of the major concerns that necessitate a tailored approach to this malignancy, especially among different age groups, skin types, and racial and socioeconomic groups.[5]

Standard ABCDE criteria often are inadequate for accurate detection of pediatric melanomas. Initial lesions often manifest as raised, red, amelanotic lesions mimicking pyogenic granulomas. Lesions tend to be very small (<6 mm in diameter) and can be uniform in color, thereby making the melanoma more difficult to detect compared to the characteristic findings in adults.[5] Bleeding or ulceration often can be a warning sign during physical examination.

With regard to incidence, pediatric melanoma is relatively rare. Since the 1970s, the incidence of pediatric melanoma has been increasing; however, a recent analysis of the SEER database showed a decreasing trend from 2000 to 2010.[4]

Our analysis of the SEER data showed an increased risk for pediatric melanoma in older adolescents. In addition, the incidence of pediatric melanoma was higher in females of all racial groups except Asian/Pacific Islander individuals. However, SES was not found to significantly influence the 5-year survival rate in pediatric melanoma.

White pediatric patients were more likely to present with localized disease compared with other races. Pediatric melanoma patients with regional disease had a 6-fold increase in mortality rate vs those with localized disease; those with disseminated disease had a 65-fold higher risk. Consistent with this, Black and Hispanic patients had the worst 5-year survival rates on bivariate analysis.

These findings suggest a relationship between race, melanoma spread, and disease severity. Patient education programs need to be directed specifically to minority groups to improve their knowledge on evolving skin lesions and sun protection practices. Physicians also need to have heightened suspicion and better knowledge of the unique traits of pediatric melanoma.[5]

Given the considerable influence these disparities can have on melanoma outcomes, further research is needed to characterize outcomes based on race and determine obstacles to appropriate care. Improved public outreach initiatives that accommodate specific cultural barriers (eg, language, traditional patterns of behavior) also are required to improve current circumstances.

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