

Racial disparities in melanoma survival

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Background: Melanoma is a cutaneous malignancy common in the white population but can also occur in other racial groups.

Objective: We sought to evaluate survival across racial groups in patients given a diagnosis of malignant melanoma.

Methods: The Surveillance, Epidemiology, and End Results database was used to populate a cohort of 96,953 patients given a diagnosis of cutaneous melanoma as their primary cancer, from 1992 to 2009.

Results: White patients had the longest survival time ($P < .05$), followed by Hispanic ($P < .05$), Asian American/Native American/Pacific Islander ($P < .05$), and black ($P < .05$) patients, respectively. Survival stratified by race and stage showed that for stages I and III, blacks had a significantly lower survival ($P < .05$), and increased hazard ratios (stage I hazard ratio, 3.037 [95% confidence interval, 2.335-3.951]; stage III hazard ratio, 1.864 [95% confidence interval, 1.211-2.87]). The proportion of later stage cutaneous melanoma (stages II-IV) was greater in blacks compared with whites.

Conclusion: Despite higher incidence of cutaneous melanoma in whites, overall survival for cutaneous melanoma in non-whites was significantly lower. Our results suggest that more emphasis is needed for melanoma screening and awareness in non-white populations to improve survival outcomes. (J Am Acad Dermatol <http://dx.doi.org/10.1016/j.jaad.2016.06.006>.)

Key words: Asian American/Native American/Pacific Islander; black; epidemiology; health outcomes; melanoma; public health; race; stage; survival; white.

Cutaneous melanoma is an aggressive form of skin cancer that is one of the most commonly diagnosed cancers in the United States.^{1,2} Incidence of cutaneous melanoma varies by race, with whites predominating, followed by Hispanics, Asians/Pacific Islanders, Native Americans, and blacks, respectively. Over the years, the incidence of melanoma has climbed quickly in adult populations, without proportional declines in mortality. Despite whites making up the overwhelming majority of patients with cutaneous melanoma, survival outcomes for non-whites are greatly reduced.³⁻⁵ Given the low incidence in minority populations,

Abbreviations used:

AANAPI:	Asian American/Native American/ Pacific Islander
CI:	confidence interval
HR:	hazard ratio
NOS:	not otherwise specified
RR:	relative risk
SEER:	Surveillance, Epidemiology, and End Results

melanoma is infrequently studied within these populations. In addition, melanoma can occur in unusual anatomical locations that can result in delays

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and underdiagnosis among clinicians.³ With minority populations projected to grow over the next several decades, it is important that clinicians and minorities understand risks associated with melanoma. In this study we examine melanoma trends using the Surveillance, Epidemiology, and End Results (SEER) database to determine if disparities in melanoma survival and diagnosis among minority populations exist.

METHODS

Data collection

The National Cancer Institute SEER database is a national registry comprising institutional review board–exempt, public-use data. The SEER-13 registry was used to extract population data and patients given a diagnosis of a primary cutaneous melanoma from 1992 to 2009 in 13 registries: Atlanta, GA; Connecticut; Detroit, MI; Hawaii; Iowa; New Mexico; San Francisco-Oakland, CA; Seattle, WA-Puget Sound; Utah; Los Angeles, CA; San Jose-Monterey, CA; rural Georgia; and Alaska. The Ohio Department of Health Institutional Review Board approved this study (no. 00002180).

The data extracted included demographic characteristics (race and ethnicity, gender, age, marital status, vital status) and clinicopathologic data (stage, Breslow depth, nodal involvement, ulceration, histologic subtype). Race and ethnicity were stratified as white, black, Asian American/Native American/Pacific Islander (AANAPI), and Hispanic. To make race and ethnicity mutually exclusive, patients identified as Hispanic were placed into a single group regardless of race. Gender was classified as male or female. Age was divided into 4 different groups (0-24, 25-49, 50-74, and ≥ 75 years). Marital status was categorized as single, married, widowed, and unknown. Death certificates and autopsy reports were excluded. Cutaneous melanoma histologic subtypes were classified via the *International Classification of Diseases for Oncology, 3rd Edition*.⁶ Subtypes were divided into superficial spreading (8743), nodular (8721), lentigo maligna (8742), acral lentiginous (8744), malignant melanoma not otherwise specified (NOS) (8720), and other melanoma (8722, 8723, 8730, 8740, 8741, 8745, 8761, 8770-8774). Breslow depth, nodal involvement, and ulceration were all

combined to create 5 different stage variables from 0 to IV by combining these values according to the American Joint Committee on Cancer criteria for presentation of stage. We calculated the incidence of cutaneous melanoma by race per 100,000 persons. Base populations were standard populations retrieved from the US Census Bureau.⁷

CAPSULE SUMMARY

- Melanoma incidence is climbing without decreases in mortality.
- White patients make up the majority of patients with melanoma, but minority counterparts have worse survival outcomes and are given a diagnosis at later stages.
- The disparities in health outcomes for minorities present a need for more awareness among providers to improve survival.

Statistical analyses

All statistical analyses were performed in RStudio (RStudio, Boston, MA). Kaplan-Meier survival curves were created, and the median survival times with their corresponding 95% confidence intervals (CIs) were calculated. Differences between 2 or more survival curves were calculated. *P* values less than .05 were considered to be significant. A Cox proportional hazards regression model was used

with the white group as the reference group. Overall survival stratified by race was calculated. The cohort was then stratified by race and stage, with race categories composed of white, black, and non-white (Hispanic, AANAPI). Survival by stage, race, and age group was determined. The cohort was then divided into different time points to determine if date of diagnosis correlated with outcomes. Patients from the first and last 5 years of the cohort—1992 to 1997 and 2004 to 2009—were analyzed through stratification by stage and race. The cohort was then split in half—from 1992 to 2000, and from 2001 to 2009—and survival analysis was completed through stratification by stage and race, followed by age, stage, and race.

RESULTS

The cohort consisted of 96,593 patients, with 91,572 whites, 509 blacks, 3293 Hispanics, and 1219 AANAPIs, who were all given a diagnosis of primary cutaneous melanoma. Males made up the majority of the cohort at 54.7%. The largest age group was 50 to 74 years (47%). In all, 55% of the cohort was married at the time of diagnosis. Using the standard population for race/ethnicity to calculate crude incidence, whites had the highest incidence rate at 45.8 diagnoses per 100,000 (95% CI, 31.96-59.68) compared with Hispanics (6.8 [95% CI, 0-34.97]), AANAPI (5.72 [95% CI, 0-48.16]), and blacks (1.35 [95% CI, 0-33.28]). Stage at presentation

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