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PII: S0190-9622(20)30517-X

DOI: https://doi.org/10.1016/j.jaad.2020.03.094

Reference: YMJD 14405

To appear in: *Journal of the American Academy of Dermatology*

Received Date: 13 March 2020

Accepted Date: 30 March 2020

Please cite this article as: Tripathi R, Archibald LK, Mazmudar RS, Conic RR, Rothermel LD, Scott JF, Bordeaux JS, Racial Differences in Time to Treatment for Melanoma, *Journal of the American Academy of Dermatology* (2020), doi: https://doi.org/10.1016/j.jaad.2020.03.094.

Racial Differences in Time to Treatment for Melanoma

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Manuscript Word Count: 1,554
Abstract Word Count: 200
Capsule Summary Word Count: 50
Total Number of Tables: 4
Number of References: 25

Conflicts of Interest: The authors report no conflicts of interest or specific funding relevant to this work.

Funding: None.

Presentations: This research was accepted as an oral presentation to the 2020 American Academy of Dermatology Annual Meeting (canceled due to COVID-19 precautions).

CAPSULE SUMMARY

- Longer time from diagnosis to definitive surgery (TTDS) is associated with increased melanoma-specific mortality; in this study, Black patients have longer TTDS for melanoma after controlling for sociodemographic factors, and these differences persist for each insurance, Stage I-III melanoma, and for time to immunotherapy.
- Targeted interventions to improve TTDS for Black melanoma patients are important in improving outcomes.

KEYWORDS

melanoma; time to definitive surgery; immunotherapy; chemotherapy; disparities; national cancer database; insurance; stage; racial; time to treatment; Black; non-Hispanic white; survival; mortality

ABSTRACT

Background: Longer time from diagnosis to definitive surgery (TTDS) is associated with increased melanoma-specific mortality. Although Black patients present with later stage melanoma and have worse survival than non-Hispanic white (NHW) patients, the association between race and TTDS is unknown.

Objective: To investigate racial differences in time to melanoma treatment.

Methods: Retrospective review of the National Cancer Database (2004-2015). Multivariable logistic regression was used to evaluate the association of race with TTDS controlling for sociodemographic/disease characteristics.

Results: Of the 233,982 melanoma patients identified, 1,221 (0.52%) were Black. Black patients had longer TTDS for stage I-III melanoma ($p<0.001$) and time to immunotherapy ($p=0.01$), but not for TTDS for stage IV melanoma or time to chemotherapy ($p>0.05$ for both). Controlling for sociodemographic characteristics, Black patients had over twice the odds of having TTDS between 41-60 days, over three times the odds of having TTDS between 61-90 days, and over five times the odds of having TTDS over 90 days. Racial differences in TTDS persisted within each insurance type. Patients with Medicaid had the longest TTDS (mean 60.4 days), and those with private insurance had the shortest TTDS (mean 44.6 days; $p<0.001$ for both).

Conclusions: Targeted approaches to improve TTDS for Black patients are integral in reducing racial disparities in melanoma outcomes.

INTRODUCTION

An estimated 2.3% of Americans are diagnosed with cutaneous melanoma annually, and the national incidence of cutaneous melanoma has continued to rise over the past decade.[1] It has been shown that dermatology visits reduce adverse events, mortality, and unnecessary hospitalizations for melanoma patients.[2,3] However, substantial disparities in access to and utilization of dermatologic care for melanoma patients have been demonstrated for a myriad of clinical and sociodemographic factors including age, sex, rurality, provider supply, distance to dermatologic care, and poverty rate.[4,5]

Specifically, race and insurance status are associated with differences in disease-specific mortality for melanoma patients.[6–8] Black patients present with later stage melanoma, and later stage melanoma at diagnosis and increased time to treatment for stage I melanoma have each independently been associated with increased melanoma-specific mortality.[6,8–10] Despite this, the association between race and time from diagnosis to definitive surgery (TTDS) is unknown.

As such, our primary goal was to investigate differences in TTDS between Black and non-Hispanic white (NHW) melanoma patients. Our secondary goals were to determine differences in TTDS between Black and NHW patients by melanoma stage and insurance type, and to examine racial differences in stage at presentation, distance from the hospital, and time to medical treatment (immunotherapy and chemotherapy).

METHODS

Patients with cutaneous melanoma were identified using the National Cancer Database (NCDB) from 2004-2015. The NCDB, produced by the American Cancer Society and the American College of Surgeons, contains data from over 1,500 accredited hospitals and over 70%

of all newly diagnosed cancer cases in the United States. Patients with American Joint Committee on Cancer (AJCC) pathologic stage I-IV cutaneous melanoma were included in this study. TTDS was calculated as the number of days between initial diagnosis and definitive surgical resection of the primary tumor. Patients with missing data for covariates, unknown stage, or excisional biopsy as definitive treatment (TTDS of zero days) were excluded.

Descriptive analyses were performed for initial univariate comparison of sociodemographic characteristics between racial groups using Pearson's Chi-Square and analysis of variance (ANOVA). Student's *t*-test (pooled) was initially used for univariate comparison of time to immunotherapy and chemotherapy, as well as for TTDS stratified by stage and insurance type between racial groups. Multivariable logistic regression was used to evaluate the association of race with TTDS controlling for sex, age, median household income, and insurance type. In the multivariable model, adjusted odds ratios were calculated for Black patients (reference group: non-Hispanic white). Institutional Review Board approval was not required for the use of this publicly available, de-identified database. All analyses were performed in the statistical software *R*, and $p<0.05$ was considered significant.[11]

RESULTS

Our sample included 233,982 patients with cutaneous melanoma, of which 1,221 (0.52%) were Black and 232,761 were NHW (99.5%; Table 1). Black and NHW patients did not differ by age ($p=0.07$). Compared to NHW patients, Black patients were more often female ($p<0.001$) and presented with later stage melanoma ($p<0.001$). Median household income differed significantly by race ($p<0.001$). Most NHW patients had a median household income of ≥$63,000 (41.9%), while most Black patients had a median household income of <$38,000 (32.9%). Insurance

status also differed by race, with a greater proportion of Black patients having Medicaid or no insurance than NHW patients (7.0% versus 2.1%, 5.7% versus 2.3%, respectively; p<0.001). On average, Black patients lived closer to the hospital than NHW patients (70.0% versus 61.6% living less than 20 miles from the hospital, p<0.001).

Most Black (70.2%) and NHW (85.1%) patients had a TTDS between 0-30 days. Compared to NHW patients, Black patients had increased average TTDS (23.4 days versus 11.7 days, p<0.001) and increased average time to immunotherapy (129.8 days versus 108.3 days, p=0.01). There was no significant difference in time to chemotherapy between Black and NHW patients (123.4 days versus 100.4 days, p=0.10).

Stratified by stage, Black patients had increased average TTDS for Stage I, II, and III melanoma (p<0.001) but not Stage IV melanoma (p=0.55; Table 2). Black patients also had increased average TTDS when stratified by insurance type (Table 3). After controlling for sex, age, income, and insurance status, Black patients were significantly more likely than NHW patients to have TTDS between 31-60 days (aOR 2.10, 95% CI 1.74-2.34), 61-90 days (aOR 3.15, 95% CI 2.42-4.02), or >90 days (aOR 5.16, 95% CI 3.84-6.80) (p<0.001 for all; Table 4).

DISCUSSION

In this study, Black patients had greater TTDS for stages I-III melanoma and greater time to immunotherapy compared to NHW patients, and the racial differences in TTDS persisted within each insurance type. There were no racial differences in TTDS for Stage IV melanoma or time to chemotherapy. Additionally, compared to NHW patients, Black patients had over twice the odds of having TTDS between 41-60 days, over three times the odds of having TTDS between 61-90 days, and over five times the odds of having TTDS over 90 days.

These findings add to the literature by demonstrating increased TTDS for Black patients with melanoma after controlling for sex, age, income, and insurance type. Our data suggest that increased TTDS in Black patients with melanoma may be an independent explanatory factor for racial differences in melanoma survival alongside factors such as later stage at presentation, biological differences in melanoma characteristics, and differences in healthcare utilization.[6,9,12]

Multiple unfavorable socioeconomic factors may exacerbate overall health status more than the additive effects of each of the individual factors.[13] Racial differences in TTDS persisted within each insurance group, implying that insurance status does not fully account for racial TTDS disparities. We found that Black patients also had increased TTDS despite living closer to hospitals, suggesting physical distance from the hospital is not as much of a contributor to TTDS for melanoma as for other cancers (e.g. colorectal).[14] A recent study of three high-risk surgical procedures showed that Black patients lived closer to high-quality hospitals but were 25-58% more likely to receive surgery at low-quality hospitals than NHW patients; it is possible that a similar phenomenon exists in TTDS for melanoma.[15] The quality and availability of melanoma treatment may thus be significantly different between racial groups for reasons other than travel burden.[15] Efforts to geographically centralize care for melanoma should consider that disparities may be driven by other extrinsic and intrinsic patient-level factors. Creation of a model delineating interactions between the myriad components underlying worse outcomes for Black melanoma patients, including race and insurance status, is critical in identifying targeted avenues for intervention.

Difference in disease characteristics by race may also impact time to treatment for melanoma. Black patients more often present with acral lentiginous melanoma (ALM) on the lower extremities and have increased Breslow depth and stage at diagnosis for other melanoma

subtypes, which portends worse prognosis.[16] Several controversies exist in the treatment of ALM that are not present in the treatment of other melanoma subtypes (such as superficial spreading melanoma), including appropriate excision margins, difficulty of primary closure, efficacy of secondary intention healing, and the use of flaps and grafts.[17–20] Furthermore, ALM may have less susceptibility to immunotherapy due to poor immunogenicity and infrequent BRAF mutation.[18] These controversies and challenges in treatment of ALM may necessitate further planning and coordination, and thus increase TTDS and time to treatment for melanoma in Black patients; ultimately, this may further exacerbate disparities in outcomes.

For a variety of cancers, including breast and colorectal, stage at presentation plays a stronger independent role in survival than race.[21,22] When stratified by stage, Black patients had increased TTDS for stages I-III melanoma, but not stage IV melanoma. Racial disparities in time to treatment may thus be less prominent for melanoma that has metastasized. Immunotherapy and targeted therapy are increasingly becoming the standard of care for patients with metastatic melanoma.[23] It has been shown that Black patients are less likely to receive immunotherapy for metastatic melanoma and various other cancers after controlling for other sociodemographic factors.[23,24] Our research also adds to the growing knowledge base regarding disparities in immunotherapy by showing that Black patients receive immunotherapy an average of 21.5 days later than NHW patients. As utilization of immunotherapy for melanoma continues to grow, it is important to better understand and address these underlying racial disparities.

Strengths of this study include use of one of the largest cancer registries in the world with rigorous quality assurance measures, variability in geography and hospital type, and availability of several nuances of treatment and staging that are not present in state-based registries. One limitation is that patients were matched by broader age group and stage categories rather than

smaller age intervals and stage subcategories. Additionally, limited information was available to further characterize the heterogeneity of chemotherapy and immunotherapy. Finally, in 2005, 48.4% of all melanomas in the US were included in NCDB; the NCDB may not be generalizable to the entire US population given that it is a hospital-based registry and there may be disproportionate representation of certain groups.[25]

CONCLUSION

This study investigated racial differences in time to treatment for melanoma using a large hospital-based administrative healthcare database. Black patients had greater TTDS for melanoma than NHW patients after controlling for other sociodemographic factors, and racial differences in TTDS persisted after stratifying by insurance type and melanoma stage. Ultimately, it is important to better understand the various components underlying worse outcomes for Black melanoma patients. Targeted approaches to improve TTDS for Black melanoma patients are integral in reducing racial disparities in melanoma outcomes.

REFERENCES

1. Noone AM, Howlader N, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ CK. SEER Cancer Statistics Review, 1975-2015, National Cancer Institute. Bethesda, MD. November 2017 SEER data submission.
2. Arakaki RY, Strazzula L, Woo E, Kroshinsky D. The Impact of Dermatology Consultation on Diagnostic Accuracy and Antibiotic Use Among Patients With Suspected Cellulitis Seen at Outpatient Internal Medicine Offices. *JAMA Dermatology*. 2014;150(10):1056. doi:10.1001/jamadermatol.2014.1085
3. Roetzheim RG, Lee J-H, Ferrante JM, et al. The influence of dermatologist and primary care physician visits on melanoma outcomes among Medicare beneficiaries. *J Am Board Fam Med*. 2013;26(6):637-647. doi:10.3122/jabfm.2013.06.130042
4. Stitzenberg KB, Thomas NE, Dalton K, et al. Distance to diagnosing provider as a measure of access for patients with melanoma. *Arch Dermatol*. 2007;143(8):991-998. doi:10.1001/archderm.143.8.991
5. Buster KJ, Stevens EI, Elmets CA. Dermatologic health disparities. *Dermatol Clin*. 2012;30(1):53-59, viii. doi:10.1016/j.det.2011.08.002
6. Dawes SM, Tsai S, Gittleman H, Barnholtz-Sloan JS, Bordeaux JS. Racial disparities in melanoma survival. *J Am Acad Dermatol*. 2016;75(5):983-991. doi:10.1016/j.jaad.2016.06.006
7. Adamson AS, Zhou L, Baggett CD, Thomas NE, Meyer A-M. Association of Delays in Surgery for Melanoma With Insurance Type. *JAMA Dermatology*. 2017;153(11):1-8. doi:10.1001/jamadermatol.2017.3338
8. Kooistra L, Chiang K, Dawes S, Gittleman H, Barnholtz-Sloan J, Bordeaux J. Racial disparities and insurance status: an epidemiologic analysis of Ohio melanoma patients. *J Am Acad Dermatol*. November 2017. doi:10.1016/j.jaad.2017.11.019
9. Conic RZ, Cabrera CI, Khorana AA, Gastman BR. Determination of the impact of melanoma surgical timing on survival using the National Cancer Database. *J Am Acad Dermatol*. 2018;78(1):40-46.e7. doi:10.1016/j.jaad.2017.08.039
10. Baranowski MLH, Yeung H, Chen SC, Gillespie TW, Goodman M. Factors associated with time to surgery in melanoma: An analysis of the National Cancer Database. *J Am Acad Dermatol*. 2019;81(4):908-916. doi:10.1016/j.jaad.2019.05.079
11. R Core Team. R: A language and environment for statistical computing. 2017. https://www.r-project.org/.
12. Tripathi R, Knusel KD, Ezaldein HH, Scott JF, Bordeaux JS. Association of demographic and socioeconomic characteristics with differences in use of outpatient dermatology services in the United States. *JAMA Dermatology*. 2018;154(11):1286-1291. doi:10.1001/jamadermatol.2018.3114
13. Shen JJ, Cochran CR, Mazurenko O, et al. Racial and insurance status disparities in patient safety indicators among hospitalized patients. *Ethn Dis*. 2016;26(3):443-452. doi:10.18865/ed.26.3.443
14. Massarweh NN, Chiang YJ, Xing Y, et al. Association between travel distance and metastatic disease at diagnosis among patients with colon cancer. *J Clin Oncol*. 2014;32(9):942-948. doi:10.1200/JCO.2013.52.3845
15. Dimick J, Ruhter J, Sarrazin MV, Birkmeyer JD. Black patients more likely than whites to undergo surgery at low-quality hospitals in segregated regions. *Health Aff*.

2013;32(6):1046-1053. doi:10.1377/hlthaff.2011.1365
16. Mahendraraj K, Sidhu K, Lau CSM, Mcroy GJ, Chamberlain RS, Smith FO. Malignant Melanoma in African-Americans A Population-Based Clinical Outcomes Study Involving 1106 African-American Patients from the Surveillance, Epidemiology, and End Result (SEER) Database (1988-2011). 2017. doi:10.1097/MD.0000000000006258
17. Nakamura Y, Teramoto Y, Sato S, Yamamoto A. Current Surgical Management of Acral Lentiginous Melanoma. In: *Melanoma - Current Clinical Management and Future Therapeutics*. Intech; 2015. doi:10.5772/59133
18. Nakamura Y, Fujisawa Y. Diagnosis and Management of Acral Lentiginous Melanoma. *Curr Treat Options Oncol*. 2018;19(8):42. doi:10.1007/s11864-018-0560-y
19. Jung JY, Roh HJ, Lee SH, Nam K, Chung KY. Comparison of secondary intention healing and full-thickness skin graft after excision of acral lentiginous melanoma on foot. *Dermatologic Surg*. 2011;37(9):1245-1251. doi:10.1111/j.1524-4725.2011.02043.x
20. Bello DM, Chou JF, Panageas KS, et al. Prognosis of acral melanoma: a series of 281 patients. *Ann Surg Oncol*. 2013;20(11):3618-3625. doi:10.1245/s10434-013-3089-0
21. Deshpande AD, Jeffe DB, Gnerlich J, Iqbal AZ, Thummalakunta A, Margenthaler JA. Racial Disparities in Breast Cancer Survival: An Analysis by Age and Stage. *J Surg Res*. 2009;153(1):105-113. doi:10.1016/j.jss.2008.05.020
22. Lai Y, Wang C, Civan JM, et al. Effects of Cancer Stage and Treatment Differences on Racial Disparities in Survival From Colon Cancer: A United States Population-Based Study. *Gastroenterology*. 2016;150:1135-1146. doi:10.1053/j.gastro.2016.01.030
23. Haque W, Verma V, Butler EB, Teh BS. Racial and Socioeconomic Disparities in the Delivery of Immunotherapy for Metastatic Melanoma in the United States. *J Immunother*. 2019;42(6):228-235. doi:10.1097/CJI.0000000000000264
24. Oliver T, Pezzi TA, Pezzi AE, et al. Immunotherapy disparities in metastatic melanoma. *J Clin Oncol*. 2019;37(15_suppl):9525-9525. doi:10.1200/jco.2019.37.15_suppl.9525
25. Bilimoria KY, Stewart AK, Winchester DP, Ko CY. The National Cancer Data Base: A Powerful Initiative to Improve Cancer Care in the United States. doi:10.1245/s10434-007-9747-3

ACKNOWLEDGMENTS

Raghav Tripathi had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. There are no potential conflicts of interest. There are no relevant financial activities outside the submitted work. There are no relationships or activities that could influence or appear to potentially influence what is written in this work. There was no funding for this work.

TABLES

Table 1: Sample demographics. Pearson's Chi-Square for categorical variables and *t*-test for continuous variables.

	NHW N (%)	Black N (%)	p-value
Total number of patients	232,761	1,221	
Age			
<30	9609 (4.1)	37 (3.0)	
30-39	17358 (7.5)	94 (7.7)	
40-49	31729 (13.6)	141 (11.5)	
50-59	48272 (20.7)	273 (22.4)	0.072
60-69	52387 (22.5)	291 (23.8)	
70-79	44031 (18.9)	243 (19.9)	
80+	29375 (12.6)	142 (11.6)	
Sex			
Male	134164 (57.6)	530 (43.4)	<0.001
Female	98597 (42.4)	691 (56.6)	<0.001
Stage of melanoma			
Stage I	154781 (66.5)	438 (35.9)	
Stage II	43644 (18.8)	385 (31.5)	<0.001
Stage III	27255 (11.7)	294 (24.1)	
Stage IV	7081 (3.0)	104 (8.5)	
Time to Treatment (days [SD])			
Time to definitive surgery	11.72 (24.61)	23.42 (37.43)	<0.001
Time to chemotherapy	100.41 (100.57)	123.36 (135.55)	0.100
Time to immunotherapy	108.31 (83.82)	129.79 (79.31)	0.012
Time to definitive surgery			
0-30 days	198054 (85.1)	857 (70.2)	
31-60 days	27782 (11.9)	241 (19.7)	<0.001
61-90 days	4775 (2.1)	70 (5.7)	
More than 90 days	2150 (0.9)	53 (4.3)	
Insurance status			
Not Insured	5275 (2.3)	69 (5.7)	<0.001
Private Insurance	126858 (54.5)	533 (43.7)	<0.001
Medicaid	4973 (2.1)	85 (7.0)	<0.001
Medicare	88760 (38.1)	484 (39.6)	0.280
Other Government	2410 (1.0)	14 (1.1)	0.702
Unknown	4485 (1.9)	36 (2.9)	0.010
Median household income			
<$38,000	24273 (10.5)	399 (32.9)	
$38,000-47,999	47061 (20.4)	272 (22.4)	<0.001
$48,000-62,999	62747 (27.2)	287 (23.7)	
$63,000+	96540 (41.9)	255 (21.0)	
Distance to hospital			
<20 miles	142166 (61.6)	847 (70.0)	
20-39 miles	43934 (19.0)	170 (14.0)	<0.001
40-59 miles	17205 (7.5)	79 (6.5)	
>60 miles	27408 (11.9)	114 (9.4)	

Abbreviations: NHW, non-Hispanic white; SD, standard deviation.

Table 2: Comparison of time to definitive surgical treatment of melanoma between racial groups by stage

Melanoma Stage	Race	Mean TTDS (days)	SD	p-value
Stage I	NHW	34.59	33.69	<0.001
	Black	45.84	42.88	
Stage II	NHW	37.71	37.52	<0.001
	Black	46.25	39.87	
Stage III	NHW	38.80	34.38	<0.001
	Black	50.78	52.34	
Stage IV	NHW	41.74	42.48	0.548
	Black	45.76	39.92	

Abbreviations: TTDS, time to definitive surgical treatment; NHW, non-Hispanic white; SD, standard deviation.

Table 3: Comparison of time to definitive surgical treatment of melanoma between racial groups by insurance type

Insurance	Race	Mean TTDS (days)	SD	p-value
None	NHW	39.33	37.917	0.027
	Black	54.8	45.835	
Private	NHW	34.29	32.002	<0.001
	Black	44.63	46.132	
Medicaid	NHW	42.55	35.968	0.046
	Black	60.41	72.707	
Medicare	NHW	35.77	23.269	<0.001
	Black	44.53	29.239	

Abbreviations: TTDS, time to definitive surgical treatment; NHW, non-Hispanic white; SD, standard deviation.

Table 4: Multivariable logistic regression for time to definitive surgery of melanoma.
*Adjusted odds ratios are for Black patients (reference: non-Hispanic white race).

Patient Demographics	Adjusted Odds Ratio (95% CI)	p-value
Sex		
Male	Reference	---
Female	1.85 (1.65-2.08)	<0.001
Age		
<30	Reference	---
30-49	1.39 (0.99-2)	0.066
50-69	1.81 (1.31-2.58)	0.001
>70	1.51 (1.06-2.22)	0.029
Median Household Income		
<$38,000	Reference	---
$38,000-47,999	0.34 (0.29-0.4)	<0.001
$48,000-62,999	0.26 (0.22-0.3)	<0.001
$63,000+	0.15 (0.12-0.17)	<0.001
Insurance		
Not Insured	Reference	---
Private Insurance	0.43 (0.33-0.56)	<0.001
Medicaid	1.14 (0.83-1.58)	0.433
Medicare	0.5 (0.38-0.67)	0.002
Other Government	0.58 (0.31-1)	0.927
Unknown	0.8 (0.53-1.2)	1.338
Time to Definitive Surgical Treatment		
0-30 days	Reference	---
31-60 days	2.01 (1.74-2.34)	<0.001
61-90 days	3.15 (2.42-4.02)	<0.001
More than 90 days	5.16 (3.84-6.8)	<0.001

Abbreviations: CI, confidence interval.