Black–White Differences in Risk for Cutaneous, Ocular, and Visceral Melanomas

Alfred I. Neugut, MD, PhD, Sara Kizelnik-Freilich, MPH, and Calvin Ackerman, MD

ABSTRACT

Fair-skinned individuals have a much higher risk of cutaneous and ocular melanomas than dark-skinned individuals, possibly reflecting a protective effect of melanin against sun exposure. There are some reasons to believe that the effect of sunlight exposure is indirect (i.e., sunlight stimulates growth factor production, which then stimulates melanocytic proliferation, leading to melanoma). Visceral melanomas are extremely rare, and little is known about them. This study used US data on 25 184 melanoma cases to investigate the White–Black ratio for visceral melanoma and did not find a disproportionality similar to that for cutaneous and ocular melanomas. The findings support the hypothesis that the sunlight effect on melanoma is primarily direct. (*Am J Public Health.* 1994;84: 1828–1829)

Introduction

Ultraviolet light has been recognized as a major risk factor for cutaneous melanoma. The same seems to be true for ocular melanoma, although there is little published information on this point.[1,2] Certainly for both of these types of melanoma, fair-skinned populations are at a greatly increased risk relative to dark-skinned populations.[3,4]

A very small percentage of melanomas arise de novo in sites other than the skin or eye. In this paper, we refer to these malignancies as visceral melanomas, including melanomas of the gastrointestinal tract, genitourinary tract, and female reproductive system (see Table 1). As a group, these malignancies are extremely rare.[4,5] Little is known about their epidemiology or etiology.

It has been suggested that the sunlight exposure leading to malignant melanomas acts indirectly, by inducing systemic growth factors.[6] If this were true, it could explain why cutaneous melanomas are often observed to arise in areas of the body, such as the trunk, that are not exposed to the sun.[7,8] To further explore this issue, we investigated whether the propensity for visceral melanomas in White and Black individuals was similar to that observed for ocular and cutaneous melanomas.

Methods

This study used data from the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute.[9] SEER is a collaboration of population-based cancer registries across the United States that captures approximately 9.2% of the US White population and 8.3% of the US Black population.[9] This study covered the time period between 1973 and 1986. Cases diagnosed at autopsy or by death certificate were excluded because of uncertainty with regard to their inclusion for incidence data. Cases from the Puerto Rico registry were also excluded because the Puerto Rican population is so different from that included in registries in the continental United States.

All malignant melanoma cases were identified by using the *International Classification of Diseases for Oncology* morphology codes[10] for melanoma (8720 through 8723, 8730, 8740 through 8745, 8761, 8770 through 8775, 9044). These cases were then divided into three groups based on anatomic site: skin (173.0 through 173.9), eye (190.0 through 190.9), and visceral (all other sites excluding skin and eye).

The age-adjusted incidence rates of cutaneous, ocular, and visceral melanomas (standardized to the 1970 US population) were calculated by means of the direct method of adjustment. Also, SAS[11] was used to calculate relative risks (RRs) and 95% confidence intervals (CIs).

Results

The number of incident cases of cutaneous, ocular, and visceral melanomas is presented in Table 1. Table 2 shows the age-adjusted incidence rates of cutaneous, ocular, and visceral melanomas. Whites had consistently higher rates than Blacks. In both Whites and Blacks, males had higher rates than females, except for visceral melanoma.

The relative risks of the three types of melanoma in Whites in comparison with Blacks are presented in Table 3. White males, as compared with Black males, had a relative risk of 13.8 (95% CI = 10.8, 17.8) for cutaneous melanoma. The relative risks of ocular and visceral melanomas among White males as compared with Black males were 7.4 (95% CI = 3.7, 14.9) and 3.0 (95% CI = 0.8, 11.1). Among White females, the relative

The authors are with the College of Physicians and Surgeons, Columbia University, New York, NY.

Requests for reprints should be sent to Alfred I. Neugut, MD, PhD, College of Physicians and Surgeons, Columbia University, New York, NY 10032.

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risks for cutaneous, ocular, and visceral melanomas were 11.3 (95% CI = 8.8, 14.4), 53.0 (95% CI = 7.3, 383.3), and 1.6 (95% CI = 0.9, 3.2), respectively.

Discussion

Melanomas arise from the malignant transformation of melanocytes, the cells that produce the dark pigment melanin. These cells are found at the base of the epidermis, as well as in the eye, genitourinary tract, and gastrointestinal tract.

While increased exposure to ultraviolet light has been found to be associated with an increase in cutaneous melanoma, the evidence for ocular melanoma is not as clear. Two major studies conducted in North America in 1985[1,2] produced opposing results. It seems likely, however, that ocular melanoma is caused by some of the same factors (e.g., ultraviolet light) that cause cutaneous melanoma, since the common cell of origin is the melanocyte and dark-skinned populations are at a much lower risk of both cutaneous and ocular melanomas.

Visceral melanomas can be defined as melanomas arising from the visceral epithelia lining the respiratory, alimentary, and genitourinary tracts.[5] Little has been published on the epidemiology of visceral melanomas. Direct sunlight cannot reach these internal tumors; thus, if direct ultraviolet light were indeed a risk factor for cutaneous and ocular melanomas, one would not expect Blacks to be more protected or Whites to be at a greater risk for visceral melanomas.

Our results showed similar rates of visceral melanoma for Whites and Blacks. We obtained increased but not statistically significant relative risks for visceral melanomas in both White vs Black males (RR = 3.0, 95% CI = 0.8, 11.1) and White vs Black females (RR = 1.6, 95% CI = 0.9, 3.2), indicating that, for these "hidden" (i.e., not directly exposed to ultraviolet light) tumors, Whites did not display a significantly elevated incidence rate relative to Blacks.

These results support the hypothesis that the effect of ultraviolet light on the risk for melanoma is direct. If there were an indirect effect (e.g., through growth factor stimulation), there would be an increased risk of melanoma in all sites at which melanocytes are present. It should be noted that visceral melanoma is extremely rare, and we were unable to verify the accuracy of its registration in these registries. Black–White differences in case ascertainment and accuracy of diagnosis may have affected the results, but the direction of such effects is not clear. □

TABLE 1—Number of Incident Cases of Cutaneous, Ocular, and Visceral Melanomas, by Race and Sex: SEER, 1973 through 1986

Melanoma	White Males	Black Males	White Females	Black Females
Cutaneous	11 747	65	11 219	88
Ocular	798	10	778	1
Visceral	109	3	348	18
Head and neck	47	1	56	2
Genitourinary tract	24	. . .	230	10
Gastrointestinal tract	16	1	39	3
Lung	6	. . .	3	1
Other	16	1	20	2

Note. SEER = Surveillance, Epidemiology, and End Results program.

TABLE 2—Age-Adjusted Incidence Rates of Melanoma, by Race and Sex (per 100 000 Person-Years): SEER, 1973 through 1986

Melanoma	White Males	Black Males	White Females	Black Females
Cutaneous	9.55	0.69	7.88	0.70
Ocular	0.67	0.09	0.53	0.01
Visceral	0.09	0.03	0.23	0.14

Note. Rates were standardized to the 1970 US population. SEER = Surveillance, Epidemiology, and End Results program.

TABLE 3—Relative Risk (95% Confidence Interval) for Melanoma in Whites as Compared with Blacks, by Sex

Melanoma	Males	Females
Cutaneous	13.84 (10.84, 17.67)	11.26 (8.82, 14.37)
Ocular	7.44 (3.71, 14.93)	53.00 (7.33, 383.25)
Visceral	3.00 (0.81, 11.08)	1.64 (0.85, 3.19)

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