

RESEARCH LETTERS

Medical Student Detection of Melanoma: Clinical Skills

The mortality from melanoma, currently the sixth most common malignant neoplasm in men and women, increases after age 50 years and can be expected to increase as the US population ages.¹ Sixteen percent of melanomas are discovered by physicians, and 76% of those are detected by primary care physicians.^{2,3} Given that 41.8% of US annual physician visits are to a family practitioner or internist, there is an opportunity for primary care physicians to perform opportunistic screening for melanoma.⁴

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Among non-Hispanic whites, early detection of melanoma has enhanced survival from 68% in the early 1970s to 92% in recent years. However, Hispanic and black patients have benefited less from early detection.⁵ The 5-year relative survival rate for black patients has changed from 67% in the 1974-1976 period to 78% in the 1995-2001 period ($P > .05$).⁶ In Florida, the proportion of distant-stage melanoma diagnosed among Hispanics and blacks remained stable from 1990 to 2004 compared with a steady decrease in the percentage of melanoma cases diagnosed at distant stage among non-Hispanic whites.⁷

Lower rates of physician surveillance, possibly due to reduced awareness of melanoma presentation in darker-pigmented individuals, is one potential cause of melanoma diagnosis disparity. To determine the performance of opportunistic screening and awareness of melanoma in light- and dark-skinned individuals, we examined the ability of second-year medical students to detect an incidental melanoma moulage applied to a non-Hispanic white and a black patient, each with a dermatologic disease.

Methods. Prior to this study, Northwestern University Feinberg School of Medicine second-year medical students near the completion of their preclinical year were required to attend a 1-hour lecture on melanoma and non-melanoma skin cancer detection. E-mails were sent to the class the week following this lecture to recruit medical students to voluntarily participate in an elective dermatology experience.

Groups of 3 to 5 students gathered around the examination table to listen to the case presentation by a der-



Figure 1. Prosthetic moulage simulating melanoma at the dorsal web of the first and second toe applied to a non-Hispanic white patient with psoriasis.

matologist, who pointed out clinical features of the disease, and the students examined 9 patients who demonstrated dermatologic conditions such as psoriasis or severe atopic dermatitis. A non-Hispanic white patient with skin phototype II and a black patient with skin phototype V, both with dermatologic conditions on their lower extremities, wore a prosthesis (moulage) simulating melanoma at the dorsal web space of the first and second toe (**Figure 1** and **Figure 2**). The remaining 7 patients did not have nevi clinically suggestive of melanoma.

Students completed a survey about their age, sex, clinical experiences in dermatology, and interest in becoming a dermatologist. They later responded to the following questions: "Did you notice any additional/other lesion(s) on any patient?" "If yes, tell us on which patient(s) you saw an additional/other lesion." In groups identifying the moulage, dermatology faculty recorded whether melanoma was included in the differential diagnoses offered by students.

We used χ^2 statistics and t tests for between-group comparisons.

Results. Among the 58 voluntary participants in a class of 140 students, 48 of them had prior dermatology experience (83%) consisting of didactic sessions ($n=18$, 38%), didactics and small group ($n=22$, 46%), observ-



Figure 2. Moulage simulating melanoma applied to a black patient.

ing a dermatologist for a half-day clinical session ($n=5$, 8%), or didactics, small group, and observing a dermatologist ($n=3$, 6%). Thirteen students classified themselves as future dermatology residents (22%), 9 as primary care (16%), and the remaining students were undecided.

Nine students noticed the “melanoma” lesion (16%). There was no significant difference due to patient race in noticing the lesion: 4 students noticed it on the black patient and 5 students on the non-Hispanic white patient. Students interested in dermatology were more likely to notice the melanoma ($P=.04$). Students identifying the lesion were more likely to offer melanoma as a possible diagnosis in the non-Hispanic white patient than they were in the black patient ($P=.03$).

Comment. While more medical students in this study identified the incidental melanoma (16%, $n=9$) than the 1 student in 285 in our group’s prior similar study (0.35%),^{8,9} students were less likely to offer melanoma as a diagnosis when the lesion was noticed on the black patient. In 1993 and 1994, Robinson and McGaghie⁹ assessed senior medical students’ ability to identify a clinically suspect lesion applied to the neck below the ear of a standardized patient being seen for “headache.”

A possible explanation for the students’ increased ability to detect the lesion in the current study is the proximity of their melanoma-detection lecture to the application of these clinical skills, which occurred 1 week after the lecture. In the earlier study, the patient with a clinically suspect lesion was seen 2 years after the students’ skin cancer detection lecture. However, the medical students had 2 years of experience in clinical clerkships and selectives. Our current study was conducted 1 week after a lecture on skin cancer detection. The clinical context may also explain the

difference in detection rates. The prior study used standardized patients with chief complaints unrelated to dermatology, while the current study used patients being seen with dermatologic conditions. Thus, the current students were cued to perform visual inspection, and the moulage was applied to the body surface on view.

Many of the students who were interested in becoming dermatologists sought clinical experiences with dermatologists, which may have increased their confidence in recognizing the lesion. Medical students commonly have less than 10 hours of exposure to dermatology over 4 years of medical school and do not feel comfortable performing skin cancer screening.¹⁰ In a survey of 659 US graduating medical students, 23% had never observed a skin cancer examination, and 43% had never examined a patient for skin cancer.¹¹ The homogeneous study sample of our study with overrepresentation of those interested in dermatology limits the generalizability of conclusions drawn from this study.

With increasing melanoma incidence and no apparent decrease in melanoma mortality, it is essential for physicians to promptly recognize it in patients from all ethnic groups, initiate culturally appropriate discussion of the possible diagnosis with the patient, and provide appropriate triaging of persons with suspect lesions. As nearly two-thirds of patients with melanoma visited a US physician in the year before diagnosis, primary care physicians are ideally positioned to perform opportunistic screening, counseling, and triage.¹² Teaching melanoma screening to medical students and reinforcing the skills with primary care residents is an essential part of professional education.

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Lack of Knowledge of Type of Skin Cancer Diagnosis

The prevalence of melanoma and nonmelanoma skin cancer (NMSC) has increased dramatically in the United States over the past 35 years. More than 750 000 individuals are living with a history of melanoma,¹ and approximately 13 million have a history of NMSC.² Discrepancies exist between estimates of melanoma prevalence based on self-reported interview data vs Surveillance, Epidemiology, and End Results (SEER) cancer surveillance data.² These discrepancies may result from patients' lack of knowledge of the type of skin cancer diagnosed.

The current study examines the extent to which individuals who reported a skin cancer history were not able to report the type of skin cancer diagnosed. Potential demographic, health, and health care correlates of lack of knowledge of skin cancer diagnosis type are also examined.

Methods. Procedures. The data were drawn from the nationally representative 2007 and 2008 US National Health Interview Surveys (NHIS). Additional information regarding the NHIS is available elsewhere.³

A total of 21 781 and 23 393 individuals were selected as sample adults for the 2007 and 2008 NHIS, respectively. Participants indicated whether they had "ever been told by a doctor or other health professional that . . . [they] had cancer or a malignancy of any kind," and if so, the type of cancer(s) diagnosed. The sample for the current study consisted of the 1172 individuals who reported a diagnosis of melanoma, NMSC, or a skin cancer of unknown type (ie, the participant could not state whether the cancer was melanoma or NMSC).

Measures. Participants indicated their race, ethnicity, sex, current age, level of education, annual family income, overall health, and health care coverage. The number of years since skin cancer diagnosis was calculated based on reported age at skin cancer diagnosis and current age.

Statistical Analysis. A dichotomous variable was created representing whether participants knew the type of their skin cancer diagnosis. A small number of individuals (n=24) reported being diagnosed with melanoma or NMSC and also an unknown type of skin cancer. For analytic purposes, these individuals were denoted as not knowing the type of skin cancer. Using SUDAAN 10.0 (RTI International, Research Triangle Park, North Carolina) and a statistical significance cutoff of $P < .05$, I conducted a series of logistic regression analyses with knowledge of skin cancer diagnosis as the dichotomous outcome variable and each of the variables listed in the "Measures" subsection herein (except race and ethnicity) as independent variables. All percentages reported were weighted.

Results. The participants were 97.3% non-Hispanic white and 49.7% female. Among the participants, 20.8% reported their skin cancer diagnosis as melanoma; 64.2% as NMSC; and 19.0% as unknown type. (Percentages sum to >100% because some individuals reported multiple types of skin cancer diagnosis.) As summarized in the **Table**, individuals were significantly more likely to lack knowledge of their type of skin cancer diagnosis if they had a lower level of education or family income, worse self-reported health, or no private health care coverage. Participant sex, age, and time since cancer diagnosis were not significantly associated with lack of knowledge of skin cancer diagnosis type.

Comment. Almost 1 in 5 individuals reporting a skin cancer diagnosis did not know whether it was melanoma or NMSC, and this rate was higher among certain subgroups. The greater lack of knowledge of skin cancer diagnosis type among individuals with lower education or