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Doctors' recognition and management of melanoma patients' risk: An Australian population-based study

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ABSTRACT

Background: Guidelines recommend that health professionals identify and manage individuals at high risk of developing melanoma, but there is limited population-based evidence demonstrating real-world practices.

Objective: A population-based, observational study was conducted in the state of New South Wales, Australia to determine doctors' knowledge of melanoma patients' risk and to identify factors associated with better identification and clinical management.

Methods: Data were analysed for 1889 patients with invasive, localised melanoma in the Melanoma Patterns of Care study. This study collected data on all melanoma diagnoses notified to the state's cancer registry during a 12-month period from 2006 to 2007, as well as questionnaire data from the doctors involved in their care.

Results: Three-quarters (74%) of patients had doctors who were aware of their risk factor status with respect to personal and family history of melanoma and the presence of many moles. Doctors working in general practice, skin cancer clinics and dermatology settings had better knowledge of patients' risk factors than plastic surgeons. Doctors were 15% more likely to know the family history of younger melanoma patients ($<$40 years) than of those $\geq$80 years (95% confidence interval 4–26%). Early detection-related follow-up advice was more likely to be given to younger patients, by doctors aware of their patients' risk status, by doctors practising in plastic surgery, dermatology and skin cancer clinic settings, and by female doctors.

Conclusion: Both patient-related and doctor-related factors were associated with doctors' recognition and management of melanoma patients' risk and could be the focus of strategies for improving care.

1. Introduction

Melanoma continues to be a significant health issue worldwide, but particularly in Australia which has one of the highest incidence rates [1]. Internationally, clinical practice guidelines consistently recommend that clinicians should identify individuals at high risk of developing melanoma and seek to reduce their risk, principally through earlier detection of subsequent melanomas [2–7]. Australian guidelines [7,8] have outlined pigmentation characteristics, personal and family history of melanoma, and number of naevi, as important risk factors for melanoma, and recommended that clinicians assess their patients for these factors. Specifically, patients with many naevi, clinically atypical naevi, a family history of melanoma (i.e. a melanoma in one first degree relative) and with a Fitzpatrick scale skin type I or II are classified as 'high risk' [7,8]. The guidelines recommended that patients classified as 'high risk' [2] should be encouraged to perform skin self-examination, be educated about specific changes that suggest melanoma, and be

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offered a skin surveillance program. In Australia, where melanoma management, encompassing diagnosis, treatment and follow-up, is shared between general practitioners and specialists [9], both groups of clinicians are in a position to perform these actions, as well as skin cancer clinics that are typically staffed by general practitioners [10]. This advice is particularly relevant to people already diagnosed with melanoma, who are at 5- to 10-fold increased risk of a subsequent primary melanoma [11,12]. Targeted high-risk screening and surveillance programs have been shown to assist with early diagnosis of melanoma and are deemed more cost-effective than a population-wide screening program [13–15].

Several studies have described different aspects of melanoma management in Australia [9,10,16–21], but few have compared real-world clinical practice with what is recommended in the national guidelines. To address this gap, we undertook a survey to evaluate clinicians' knowledge and management of risk factors for people residing in the state of New South Wales (NSW) with a diagnosis of melanoma notified to the NSW Cancer Registry during a 12-month period in 2006–07. Using these data, we aimed to: 1) determine doctors' knowledge of their patients' melanoma risk; and 2) identify factors associated with doctors' recognition and subsequent management of patients' melanoma risk, particularly related to skin self-examination and surveillance for early detection of future melanomas.

2. Materials and methods

2.1. Study design and population

The Melanoma Patterns of Care Study was a population-based, observational study. It was based on doctors' reported clinical management of NSW residents of any age who had a pathologically-confirmed primary in situ or invasive cutaneous melanoma, or a melanoma of unknown primary site, notified to the NSW Cancer Registry between 23 October 2006 and 22 October 2007. Melanomas were classified based on ICD-O-3 (International Classification of Diseases for Oncology, 3rd edition) codes C44.0 to C44.9 or C80.9 and histology codes 8720–8790/2 (in situ) or/3 (invasive) [22]. The study was conducted with ethics approval from The University of Sydney Human Research Ethics Committee and the NSW Population and Health Services Research Ethics Committee.

2.2. Data collection

Information was collected from the NSW Cancer Registry on the characteristics of the patients, their lesions, and the doctors involved in their care. The 'primary doctor' for this study was defined as the requesting doctor on the diagnostic pathology report on which the cancer registration was based, and was considered to be the doctor providing initial care following diagnosis. For each eligible patient, the primary doctor was contacted as soon as possible but not less than three months after the notification was received, by the study team and asked to complete a questionnaire regarding the clinical management of that patient. If the primary doctor referred the patient to other doctors (referral doctors), they were then also contacted by the study team and asked to complete questionnaires. This process was followed for all notifications of invasive melanomas but for only the first 450 notifications of in situ melanomas that were only collected for a short period. For doctors with large numbers of eligible patients, if requested, trained field workers with nursing experience completed the questionnaires from patients' medical records. Seventy-two percent of patients had at least one returned questionnaire; the questionnaire completion rate was 78%; of these 68% were completed by doctors and 32% by trained field workers. There was a median of 385 days between diagnosis and return of questionnaires.

Questions about doctors' knowledge of their patients' risk and subsequent clinical management regarding skin surveillance are shown in Table 1. We created a 'patient risk' variable based on three important risk factors: multiple primary melanomas (i.e. a previous melanoma before the study period), family history of melanoma, and having many moles. Patients without any of these risk factors were placed in the 'lower risk' category; those with at least one reported risk factor were placed in the 'higher risk' category and those whose risk factors were not known were categorised as 'no knowledge'.

We used postcode to estimate the relative remoteness, accessibility and socio-economic disadvantage of patients' place of residence and doctors' practice location. Postcodes were linked to classification systems endorsed by the Australian Government, including Rural Remote and Metropolitan Areas (RRMA) [23], Accessibility/Remoteness Index of Australia (ARIA) [24], and the Socio-Economic Indexes for Areas (SEIFA) [25].

2.3. Statistical analysis

This analysis focused on patients with invasive, localised melanoma and thus excluded in situ or metastatic melanoma. Our main analyses also excluded questionnaires completed by trained field workers because of the higher proportion of unrecorded information in the medical records for the risk factor variables related to this analysis. We conducted a sensitivity analysis that included questionnaires completed by doctors and field workers. For 1.2% of patients with more than one diagnosis of invasive melanoma during the 12-month period, we included data related to the first invasive lesion only.

Prevalence ratios (PR) and 95% confidence intervals (CI) were estimated using log binomial regression models [26]. Multivariate models were fitted using a forward stepwise approach with a cut-off *p*-value of 0.10 to determine which variables were independently associated with doctors' knowledge of patients' risk factors for melanoma and their clinical management regarding early detection-related follow-up advice. All statistical models included patient age and gender; and models of patient management included the patient risk variables, regardless of statistical significance, as they were considered *a priori* as important covariates. Other factors assessed for inclusion were patients' and doctors' socio-demographic characteristics, doctors' specialty and practice setting, and histopathological features of the melanoma. Missing values were excluded from the multivariate analysis. Analysis was conducted using SAS software version 9.4 [27].

Table 1
Questions for doctors regarding their patients' risk factors and early detection-related follow-up.

Questions regarding risk factors
  Did the patient have a:
    Personal history of melanoma? *No, Yes, Don't know*
    Family history of melanoma in a blood relative? *No, Yes, Don't know*
    Did this patient have lots of moles? *No, Yes, Don't know*

Questions regarding early detection-related follow-up
  Did you do any of the following?
    Advise patient on specific changes that suggest melanoma? *Yes, No*
    Encourage patient to perform skin self-examination? *Yes, No*
    Recommend a skin surveillance program? *Yes, No*