The impact of subspecialization and dermatoscopy use on accuracy of melanoma diagnosis among primary care doctors in Australia

Cliff Rosendahl, MBBS,[a] Gail Williams, PhD,[b] Diann Eley, PhD,[a] Tobias Wilson, Candidate BSc,[c] Greg Canning, MMed,[d] Jeffrey Keir, MBBS,[e] Ian McColl, FACD,[f] and David Wilkinson, DSc[a]
Capalaba, Herston, Wynnum Central, Hermit Park, Tugun, and Brisbane, Queensland; and Ballina, New South Wales, Australia

Background: Dermatoscopy improves accuracy of melanoma diagnosis, but the impact of subspecialization in skin cancer practice among general practitioners on melanoma diagnostic accuracy is not known.

Objective: To assess the impact of dermatoscopy use and subspecialization on the accuracy of melanoma diagnosis by general practitioners.

Methods: We did a prospective study on the Skin Cancer Audit Research Database and measured melanoma 'number needed to treat' (NNT), with 21,900 lesions excised to diagnose 2367 melanomas.

Results: Melanoma NNT fell from a high of 17.0 (95% confidence interval [CI] 14.5-20.7) among general practitioners with a generalist practice to 9.4 (CI 8.9-10.1) among those with a specific interest in skin cancer, and 8.5 (CI 8.1-9.0) among those practicing only skin cancer medicine ($P < .0001$). Melanoma NNT fell from a high of 14.6 (CI 12.0-18.6) among dermatoscopy low/non-users to 10.9 (CI 9.8-12.4) among medium users, and 8.9 (CI 8.6-9.3) among high users ($P < .0001$). The association between NNT and practice type remained ($P < .0001$) when adjusted for dermatoscopy use and other variables. The association between NNT and dermatoscopy use disappeared ($P = .41$) when adjusted for practice type and other variables.

Limitations: There is selection bias with respect to participating doctors and completeness and accuracy of data are not independently verified in the Skin Cancer Audit Research Database (SCARD).

Conclusions: General practitioners who subspecialize in skin cancer have a higher use of dermatoscopy and diagnose melanoma with greater accuracy than their generalist counterparts. (J Am Acad Dermatol 2012;67:846-52.)

Key words: audit; dermatoscopy; dermoscopy; general practice; melanoma; NNE; NNT; number needed to excise; number needed to treat; subspecialization.

INTRODUCTION

The incidence of melanoma has increased globally over the last 30 years and melanoma is a significant cause of mortality among Caucasians worldwide.[1] In Australia in 2010 the incidence was estimated at 50 per 100,000 population, with 1500 deaths and a mortality rate of 6 per 100,000 population.[2] As the only effective way of reducing melanoma mortality is early excision, early diagnosis is essential. Dermatoscopy has been shown to improve diagnostic accuracy for melanoma[3-6]; however, studies on the effect of dermatoscopy on diagnostic accuracy in routine primary care practice are limited.[7-9]

There is an increasing trend for primary care doctors to subspecialize in a variety of fields.[10-15]

From the School of Medicine, The University of Queensland, Herston, Brisbane[a]; the School of Population Health, The University of Queensland, Herston, Brisbane[b]; DirectNET[c]; Hermit Park Clinic and Skin Cancer Care[d]; Northern Rivers Skin Cancer Clinic[e]; and John Flynn Hospital, Tugun[f]; (author Wilson is an Honorary Associate of the Skin Cancer College of Australia and New Zealand).

Funding sources: None.
Conflicts of interest: None declared.

Accepted for publication December 29, 2011.
Reprints not available from the authors.

Correspondence to: Cliff Rosendahl, MBBS, 5 Larbonya Crescent, Capalaba 4157, Australia. E-mail: cliffrosendahl@bigpond.com.

Published online February 13, 2013.
0190-9622/$36.00

doi:10.1016/j.jaad.2011.12.030

While some see this as fragmenting and weakening the discipline of general practice,[15] others see it as increasing access to specialist care in the community.[10-14] In Australia primary care doctors manage more than half the skin cancer burden, including almost half of all melanomas.[16] Many primary care doctors have a specific interest in skin cancer medicine and the practice of some is exclusive to this field.[10,11] Colleges, interest groups, and training programs have developed.[17] Data on quality of care provided in this setting is limited and the role of such subspecialized primary care doctors in the health system is contested.[10,11,18]

We used the Skin Cancer Audit Research Database (SCARD)[17] to prospectively study the impact of levels of dermatoscopy use and of subspecialization among primary care doctors on the accuracy of melanoma diagnosis in routine care.

This study tests the hypothesis: With respect to skin cancer management in Australia, the use of dermatoscopy both improves clinical diagnostic accuracy and increases the ratio of skin cancers to all lesions biopsied or excised. This improvement is independent of the type of doctor using dermatoscopy, that is, family general practitioner or skin cancer clinic doctor.

CAPSULE SUMMARY

- Dermatoscopy improves diagnostic accuracy for melanomas but subspecialization by general practitioners has not previously been shown to be of benefit.
- General practitioners subspecialized in skin cancer treatment excised half the number of benign lesions for each melanoma detected compared with their generalist colleagues.
- The role of such subspecialized general practitioners should be defined and the factors associated with their higher performance, including trained dermatoscopy use, should be promoted.

METHODS

SCARD is a database created as a project of the Skin Cancer College of Australia and New Zealand (SCCANZ). There is an online computerized version and a paper-based version. Designed as a tool for doctors to track specimens from initial scheduling through to completion of treatment, it is also used to record details of treatment and outcomes and provides an audit report for contributing doctors.[17] The report may be accessed at: http://www.skincanceraudit.com/demo.

Ethics approval was obtained from the Royal Australian College of General Practitioners to make use of data collected since January 1, 2008, for which a signed consent had been obtained from the contributing doctors.

We elected to confine this study to lesions excised to exclude melanoma and to use the number of lesions treated to find one melanoma (NNT) as the measure of diagnostic accuracy; for the analyses presented herein, we only included data from primary care doctors in Australia who treated lesions for the stated purpose of excluding melanoma. In SCARD, doctors declare their practice type as general practitioners ([GP]; doctors with a typical generalist practice), general practitioners with a special interest in skin cancer ([GPSISC]; doctors with generalist practices but with a particular focus on patients with skin cancer) or dedicated skin cancer practitioners ([DSCP]; doctors who only see skin cancer patients). Doctors also declare their level of dermatoscopy use as either high (used for all pigmented lesions), medium (used most days), low (used less than weekly), or none.

Statistical analysis

In this analysis, melanomas include all new histologically confirmed melanomas whether in situ or invasive. At data entry the doctor must complete all SCARD fields including provisional diagnosis (one option only) and for all new lesions (not already biopsied) a selection between 'Exclude melanoma', 'Exclude non-melanoma skin cancer' or 'Not-applicable'. Doctors are advised that if the purpose of the procedure is to exclude skin cancer they must select either 'Exclude melanoma' or 'Exclude non-melanoma skin cancer' even if they are certain the lesion is malignant. 'Not-applicable' is only to be selected when malignancy is not in the differential diagnosis, such as with removal of a sebaceous cyst or dermal nevus for cosmetic reasons. When the histology report is received, the histological diagnosis is added.

We calculated the 'number needed to treat' (NNT), also known as 'number needed to excise', as the total number of new lesions treated where 'Exclude melanoma' was selected, divided by the number of new lesions with a histological diagnosis of melanoma. We compared the NNT for the 3 different categories of primary care doctors (GP, GPSISC, DSCP) and for the 3 different categories of level of dermatoscopy use (low/none, medium, high). Confidence intervals were calculated and multivariate analyses of the proportion of histologically diagnosed melanomas by doctor characteristics (age, sex, type) and patient characteristics (age, sex) were carried out using