Family Physician Visits and Early Recognition of Melanoma

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ABSTRACT

Background: Malignant melanoma is a deadly skin cancer with a rapidly-increasing incidence, mortality and public health burden. Thin melanomas are easily treated with good prognosis, while the thicker lesions have relatively poor survival. To broaden strategies for early recognition of melanoma, we investigated the relationship between primary care service and melanoma thickness at diagnosis.

Methods: All 714 patients diagnosed with a primary malignant melanoma between January 1995 and December 1999 in Nova Scotia were included in the present study and linked to provincial physician billing databases to reveal the patients' use of family physician services prior to the diagnosis of melanoma. We examined the importance of physician use of services for tumour thickness using logistic regression while adjusting for potential confounders. Tumour thickness was dichotomized to thin and thick using 0.75 mm as a cutoff.

Results: Patients who regularly visited their family physician (2 to 5 times during a two-year interval prior to diagnosis) were 66% (95% CI, 31-84) less likely to be diagnosed with thick melanoma as compared to patients who consulted their family physician less or not at all. Progression to thick tumours could have been reduced by 11.70% (95% CI, -1.33-25.77) if all patients had consulted their family physician at least once a year.

Discussion: Increased awareness of the need for regular medical check-ups could reduce the public health burden of melanoma.

MeSH terms: Melanoma; neoplasms; prevention and control; primary health care; public health

La traduction du résumé se trouve à la fin de l'article.

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Malignant melanoma is a deadly skin cancer with a rapidly-increasing incidence, mortality and public health burden.[1-4] The worldwide incidence of melanoma in 2000 was 2.4/100,000 for males and 2.21/100,000 for females.[5] Australia and New Zealand are recorded to have the highest rates of melanoma in the world, with the lowest rates reported in China, India, Japan and Singapore.[5] It is estimated that in 2003, there will be 54,200 new cases of melanoma and 7,600 consequent deaths in the US; Canadian estimates for the same period are 3,900 new cases and 840 deaths.[6,7]

Sun exposure, history of sunburns, light skin, and multiple nevi (moles)[8] are established risk factors for melanoma; family history, previous primary melanomas and male gender have also been reported as risk factors.[9-13] Melanoma thickness at time of diagnosis is the single most important determinant of prognosis.[14,15] Thin melanomas are easy to treat and are associated with minimal mortality, while thick melanomas result in poor prognoses.[16] Based on Breslow's microstages, patients with a tumour thickness of less than 0.75 mm have a 5-year survival rate of more than 98%.[4] Survival rates steadily drop as tumour thickness increases with a 5-year survival of less than 50% for patients with tumours thicker than 4.0 mm.[4] Patients diagnosed with thick melanomas tend to have lower educational and socio-economic backgrounds, to smoke and to be older, male, and of non-white race.[17,18]

In the absence of a population screening program, early recognition has generally been left to the individual and his or her family physician. Easy access to a family physician has been reported to benefit early diagnosis of melanoma.[14,17] Also, better physician-patient relationships may be reflected in regular consultation of the same physician and may be effective in preventing disease.[19,20] Barriers to medical care, on the other hand, have been demonstrated to be associated with the diagnosis of thicker melanomas.[21-24]

To further our understanding of how family physicians can play a role in the reduction of the disease burden associated with melanoma, we here investigate the relationship between the use of family physician services and melanoma thickness at diagnosis.

METHODS

The Nova Scotia Cancer Registry was used to identify all patients diagnosed with primary malignant melanomas between January 1995 and December 1999. Information on tumour thickness was obtained from registry codes based on pathology reports of excised melanoma lesions. The patient and tumour information from the Nova Scotia Cancer Registry was linked with administrative databases of Medical Service Insurance that files physician billing of all provincial residents to allow us to quantify physician services for patients diagnosed with melanoma in Nova Scotia. The electronic linkage could be established for all patients on the basis of their health card numbers that were first scrambled by an independent institution to ensure anonymity and privacy. The Research Ethics Committee of the QEII Health Sciences Centre in Halifax approved the linkage and statistical analyses.

We quantified the use of family physician services on the basis of two years of observations prior to the diagnosis of melanoma. We evaluated the period 1 to 3 years preceding the diagnosis to avoid inclusion of physician services associated with the melanoma diagnosis. We evaluated physician services in two ways in this study: the number of family physician visits and the number of different family physicians visited. We used average household income of the enumeration area of residence available through the 1996 Canada census as a proxy for socioeconomic status.[25] We further considered age, gender and location of cancer as independent covariates for tumour thickness, the outcome of interest. We dichotomized tumour thickness: less than 0.75 mm was considered thin and greater than or equal to 0.75 mm was considered thick.[13,17,22,26,27] We applied univariate and multivariate logistic regression analyses to examine the relationship between physician services and tumour thickness at diagnosis. We used SAS version 8.2 and present odds ratios with 95% confidence intervals. We calculated a preventable fraction of thick melanomas in the Nova Scotia population using methods described in detail elsewhere.[28] Briefly, we used the above multivariate logistic regression model to estimate the number of patients who would be diagnosed with thick melanoma if we assume all patients had consulted their family physician at least twice in the two-year period prior to diagnosis. This estimate will reveal a lower number of patients with thick melanoma than the observed number if patients who regularly consult their family physician are less likely to be diagnosed with thick melanoma. The difference between the estimated and observed number of patients with thick melanoma constitutes the preventable fraction.[28]

TABLE I

Characteristics of Melanoma Patients Diagnosed in Nova Scotia Between 1995 and 1999

Total Number of Melanoma Patients	**675**
Females/males	330/345
Mean age (range)	56 yrs (18-94 yrs)
Mean household income (range) *	$44,653 ($14,577-$112,263)
Melanoma thickness	
<0.75 mm	334 (49.5%)
≥0.75 mm	302 (44.7%)
Missing	39 (5.8%)
Disease stage at diagnosis	
Local spread	469 (69.5%)
Regional spread	17 (2.5%)
Distant spread	8 (1.2%)
Missing	181 (26.8%)
Location of melanoma	
Arm	169 (25.0%)
Leg	155 (23.0%)
Trunk	205 (30.4%)
Other	146 (21.6%)
Number of family physician visits†	
≤1	86 (12.7%)
2-5	151 (22.4%)
6-15	274 (40.6%)
>15	164 (24.3%)
Number of family physicians visited†	
0	44 (6.5%)
1-2	377 (55.9%)
3-5	214 (31.7%)
>5	40 (5.9%)

* 25 patients had missing values
† The number of physician visits and the number of physicians visited during the 1 to 3 year period prior to diagnosis

RESULTS

A total of 714 melanoma diagnoses were reported to the Nova Scotia Cancer Registry between January 1995 and December 1999. Among these, 675 (94.5%) were primary diagnoses. The 39 patients who were previously diagnosed with cancer were excluded from the analysis as their pattern of physician services may have been affected by physician visits related to their primary cancer. The thickness of the primary melanomas ranged from 0.10 mm to 12.0 mm; the average was 1.24 mm and 52.5% had a tumour thickness of less than 0.75 mm (Table I). Among the 675 patients with primary diagnoses of melanoma, 86 (12.7%) had not or had only once visited a family physician during the two-year period prior to diagnosis (Table I).

Univariate and multivariate analyses revealed increasing age and rural rather than urban residency to be statistically significant determinants of a thick melanoma at the time of diagnosis (Table II). Patients who visited their family physician not at all or only once in two years prior to diagnosis were more likely to be diagnosed with a thick melanoma; patients who had visited the same doctor between 2 and 5 times during the two-year interval prior to diagnosis were 66% (see Table II: One minus the value of the odds ratio times 100%) less likely to be diagnosed with a thick melanoma as compared to patients who had one or no visits to a family doctor in that period. Within categories of the same number of visits, patients who visited fewer family physicians had a decreased risk of being diagnosed with a thick melanoma, although these differences were not statistically significant.

A total of 91 patients (13.5%) had visited a dermatologist during the two-year period prior to diagnosis. Visits to dermatologists were not statistically significantly associated with an increased or reduced likelihood for being diagnosed with thick melanoma. Also, income and the location

TABLE II

Univariate and Multivariate Adjusted Odds Ratios for Tumour Thickness

	Univariate OR (95% CI)	Multivariate OR (95% CI)
Gender		
Male	1.00	1.00
Female	0.76 (0.55 – 1.03)	0.80 (0.57 – 1.10)
Age (years)		
<45	1.00	1.00
45-59	1.13 (0.73 – 1.74)	1.15 (0.74 – 1.79)
60-69	1.03 (0.63 – 1.67)	1.06 (0.64 – 1.76)
≥70	1.68 (1.07 – 2.64)	1.82 (1.12 – 2.94)
Residency		
Rural	1.00	1.00
Urban	0.68 (0.50 – 0.93)	0.67 (0.49 – 0.93)
Visits/doctors		
0-1 visits	1.00	1.00
2-5 visits, 1 doctor	0.36 (0.17 – 0.72)	0.34 (0.16 – 0.69)
2-5 visits, >1 doctor	0.56 (0.30 – 1.04)	0.55 (0.29 – 1.03)
6-15 visits, 1-2 doctors	0.50 (0.29 – 0.88)	0.46 (0.26 – 0.82)
6-15 visits, >2 doctors	0.54 (0.30 – 0.98)	0.53 (0.29 – 0.98)
>15 visits, 1-3 doctors	0.61 (0.33 – 1.44)	0.50 (0.26 – 0.97)
>15 visits, >3 doctors	0.68 (0.35 – 1.30)	0.59 (0.30 – 1.17)

OR: Odds Ratio; CI: Confidence Interval; thick tumours: ≥ 0.75 mm at diagnosis

of the melanoma were not significantly associated with tumour thickness, nor did the inclusion of the above covariates in the multivariate analysis substantially alter the estimates of the odds ratios of physician services for melanoma thickness.

If patients who had one or no visits to a family physician during the two-year observation period, had visited one doctor 2 to 5 times instead, the preventable fraction of thick tumours in the patient population would have been 6.55% (95% CI, 2.02-11.21). If the patients who consulted various family physicians had instead obtained the same number of services from fewer physicians, the number of patients with thick tumours would have been reduced by 5.25% (95% CI, -5.64-16.47). If both of the above scenarios had occurred simultaneously, then the preventable fraction would have been 11.70% (95% CI, -1.33-25.77). This reduction translates into 35 fewer patients with a thick melanoma at diagnosis in Nova Scotia over the five-year period.

DISCUSSION

Patients with melanoma who regularly consulted their family physician were less likely to be diagnosed with a thick melanoma. Also, it appears that patients with melanoma who visited the same family physicians, were at lower risk of a diagnosis of thick melanoma, however, these differences were small and not statistically significant. These findings are consistent with studies reporting that frequent check-ups and good physician-patient relationships are effective means of prevention.[19,20]

This study concurred with previous ones in that males and older individuals are more likely to have thicker tumours at time of diagnosis.[4] Also, the observation that patients in urban areas were less likely to have thick tumours is in agreement with earlier reports.[4] The underlying reason for this association may, at least in part, reflect geographic barriers to access of care and becomes particularly relevant in light of understaffing of health professions in rural areas.[29]

We estimated the preventable fraction of thick melanomas to be approximately 12%. This reflects the percentage of late diagnoses that could be prevented with initiatives emphasizing the importance of annual check-ups and a regular family physician for early recognition. As approximately 90% of the total annual direct cost of treating melanoma is attributed to less than 20% of patients – these being the patients with advanced disease – such initiatives may greatly reduce overall health care costs.[30]

A strength of our analytic approach is the use of administrative data that are continually and routinely collected. The analysis is therefore free of recall bias and, as all patients are included, minimally subject to selection bias. However, a general limitation of research based on administrative data is that it is not collected for the purposes of research and therefore may not be subject to rigorous data quality checks and may lack particular specifics. For example, we had assumed that patients who consulted various physicians had a poorer relationship with these physicians than patients who consistently consulted the same physician, and found that the latter patients were diagnosed earlier. Clearly, further research is needed to establish the association between good patient-doctor relationships and early recognition of cancer. A further limitation emerges from the limited statistical power and its consequences for the identification of statistically significant differences.

In summary, people who visit their family physician at least once a year are less likely to be diagnosed with thick melanoma and have better prognoses, thereby contributing to reduced health care costs associated with the treatment of melanoma.

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RÉSUMÉ

Contexte : Le mélanome malin est un cancer mortel de la peau dont l'incidence, la mortalité et le fardeau pour la santé publique augmentent rapidement. Les mélanomes minces sont faciles à traiter et présentent un bon pronostic, mais les chances de survivre à une lésion plus épaisse sont relativement faibles. Pour étoffer les stratégies de dépistage précoce des mélanomes, nous avons étudié la relation entre les services de soins primaires et l'épaisseur du mélanome lors du diagnostic.

Méthode : Les 714 patientes et patients ayant reçu un diagnostic de mélanome primaire entre janvier 1995 et décembre 1999 en Nouvelle-Écosse ont été inclus dans la présente étude, et nous avons relié les informations à leur sujet aux bases de données de facturation des médecins de la province pour déterminer si ces patientes et patients avaient utilisé les services d'un médecin de famille avant leur diagnostic. Nous avons examiné l'importance du recours aux services d'un médecin selon l'épaisseur de la tumeur au moyen d'une analyse de régression logistique, après ajustement selon les facteurs confusionnels possibles. Les tumeurs mesurant moins de 0,75 mm d'épaisseur ont été jugées minces, et les autres, épaisses.

Résultats : Les personnes qui avaient périodiquement consulté leur médecin de famille (de deux à cinq fois pendant la période de deux ans précédant le diagnostic) étaient dans une proportion de 66 % (IC de 95 % = 31-84) moins susceptibles d'avoir reçu un diagnostic de mélanome épais que les patientes et les patients ayant consulté leur médecin de famille moins souvent ou ne l'ayant pas fait du tout. Il aurait été possible de réduire l'épaississement des tumeurs dans une proportion de 11,7 % (IC de 95 % = 1,33 25,77) si l'ensemble des patientes et des patients avaient consulté leur médecin de famille au moins une fois l'an.

Discussion : Une sensibilisation accrue au besoin de subir des examens de santé périodiques pourrait réduire le fardeau que représentent les mélanomes pour la santé publique.