SHORT COMMUNICATION

Patients' Characteristics and Environmental Factors Affecting Skin Cancer Detection: A Multicentre Prospective Study

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The US Preventive Services Task Force (USPSTF) has stated that there is insufficient evidence to recommend skin cancer screening, based on the absence of randomized controlled trials demonstrating a positive impact on mortality, and an uncertain risk/benefit balance (1, 2). In the absence of a screening recommendation for the general population, visual inspection and clinical history of change remain key to the detection of skin neoplasms. The aim of this study is to determine what factors influence skin cancer care-seeking by the patient or their family and relatives, a concept that could be useful in determining where to focus specific efforts to improve the outcomes of interventions targeting skin cancer.

MATERIALS, METHODS AND RESULTS

A descriptive cross-sectional study was performed with consecutive recruitment in 3 hospitals in the Community of Madrid. Ethical approval was received from the Hospital Clínico San Carlos Institutional Review Board (number 20/141). Inclusion criteria were: patients older than 18 years old with a confirmed histological diagnosis of skin cancer: basal cell carcinoma (BCC), squamous cell carcinoma (SCC) or melanoma. Patients with any condition that prevented them from noticing the presence of a skin tumour were excluded from the analysis. Epidemiological and clinical data for each of the participants were included. Univariate analysis was performed to identify clinical and personal factors affecting skin cancer detection. Multinomial logistic regression was performed to assess the predictors of detection of a malignant lesion by the patient or their relatives, taking as a reference those detected by health professionals. The adequacy of the model was assessed using goodness-of-fit and likelihood ratio tests.

A total of 1,000 participants (685 with BCC, 232 with SCC, and 83 with melanoma) were included. In 58% of the cases, the patient or family member were responsible for detection of the tumour. No relevant differences were found between the participating centres in patients` clinical characteristics. Data concerning the clinical and demographic characteristics of included patients are summarized in Table SI. The variables in univariate analysis that were significantly associated with detection of the lesion by the patients, or by their social environment (age, sex, employment status, marital status, living alone, tumour type, long axis diameter, location, time of disease evolution, associated symptoms and personal history of skin cancer) were included in the multinomial logistic regression model. The fit of the model was considered adequate (goodness-of-fit $p > 0.5$ and likelihood ratio $p < 0.001$). The analysis showed a statistically significant association between the time of disease evolution and symptoms for both groups. Not knowing the time course of the tumour was associated with lower detection by patients (odds ratio (OR) 0.18 (0.10–0.33); $p < 0.001$) or their relatives (OR 0.48 (0.25–0.92); $p = 0.03$). Concerning clinical findings, the absence of symptoms was associated with less detection of tumours by patients (OR 0.19 (0.11–0.35); $p < 0.001$), while the presence of bleeding was associated with a higher discovery of malignant lesions by family members or relatives (OR 3.37 (1.22–9.34); $p = 0.019$). Living with a partner was associated with a more likely discovery of lesions by family or close relatives (OR 3.24 (1.79–5.88); $p < 0.001$), and location in the posterior trunk was associated with less detection of lesions by patients (OR 0.30 (0.14–0.64); $p = 0.002$) (**Table I**).

DISCUSSION

The question of who is most likely to detect a malignant lesion first has traditionally been considered a source of controversy. This study highlights the central role of the patient and factors related with their environment in the initial detection of skin cancer (58.8%), while at the same time following the trend of studies showing that a large proportion of malignant skin lesions are initially detected by the patient (3, 4).

Various clinical and demographic factors could be responsible for the differences found. Regarding location, patients showed a lower tendency to detect lesions located on the posterior trunk. This result is similar to the findings of Geller et al. (5), in which the detection of malignant lesions on the back area by physicians or close associates was higher than by the patient. Absent or incomplete self-examination could be considered one of the main obstacles (6). Although not all locations are easily visible to patients, an American study showed that only 9% of patients regularly made comprehensive observations of their skin (7). Studies with a similar approach have also shown that living alone is associated with incomplete examination of the skin surface (8). The results of the current study suggest that this theory is reinforced by the increased tendency of family members and relatives to recognize skin tumours compared with those patients who live alone. Other patient demographic factors have also been reported to influence concern, awareness or the likelihood of noticing skin cancer (9, 10). However, no differences in predisposition to detect tumours were found related to the patient's age, sex, employment status or marital status ($p > 0.05$).

As the person with the best chances of observing early symptoms, the involvement of the patient and their fa-

Table I. Clinical and personal factors affecting skin cancer detection in patients and their family and relatives. The multinomial logistic regression model summary.

	Detection patterns in patients with skin cancer (reference category is "Healthcare professionals")			
	Patient		Family or relatives	
Variable	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Age at diagnosis, years[a]	0.99 (0.97–1.01)	0.32	0.99 (0.99–1.04)	0.65
Sex				
Male	0.86 (0.62–1.19)	0.35	1.28 (0.84–1.96)	0.5
Female	1		1	
Employment situation				
Unemployed	1.01 (0.5–2.07)	0.97	0.58 (0.20–1.64)	0.30
Active	1.11 (0.59–2.13)	0.73	1.06 (0.46–2.42)	0.90
Retired	1		1	
Marital status				
Single	0.84 (0.46–1.52)	0.56	0.82 (0.37–1.83)	0.63
Married/part of a couple	1.36 (0.89–2.07)	0.16	0.70 (0.42–1.19)	0.19
Widowed or divorced	1		1	
Lives alone				
No	1.20 (0.80–1.83)	0.38	3.24 (1.79–5.88)	< 0.001*
Yes	1		1	
Type of tumour				
Melanoma	1.13 (0.57–2.28)	0.72	1.40 (0.61–3.24)	0.43
BCC	0.78 (0.52–1.18)	0.24	0.92 (0.54–1.59)	0.77
SCC	1		1	
Long axis diameter, mm[a]	1.02 (0.99–1.04)	0.07	1.02 (0.99–1.04)	0.10
Location				
Face	1.24 (0.67–2.30)	0.49	1.17 (0.49–2.80)	0.72
Scalp and neck	1.29 (0.64–2.59)	0.48	1.84 (0.72–4.70)	0.20
Anterior trunk	1.21 (0.54–2.70)	0.64	1.57 (0.53–4.67)	0.42
Back	0.30 (0.14–0.64)	0.002*	1.52 (0.60–3.81)	0.38
Upper extremities	1.15 (0.52–2.43)	0.72	1.25 (0.44–3.58)	0.67
Lower extremities	1		1	
Time of disease evolution				
Unknown	0.18 (0.10–0.33)	< 0.001*	0.48 (0.25–0.92)	0.03*
< 6 months	1.34 (0.86–2.09)	0.20	1.19 (0.64–2.19)	0.58
6–12 months	1.34 (0.85–2.10)	0.21	1.78 (0.99–3.20)	0.06
> 12 months	1		1	
Symptoms				
No	0.19 (0.11–0.35)	< 0.001*	0.92 (0.36–2.34)	0.86
Growth	0.77 (0.43–1.37)	0.37	2.01 (0.82–4.95)	0.13
Itch, local discomfort	1.06 (0.58–1.95)	0.85	1.82 (0.70–4.74)	0.22
Bleeding	1.59 (0.79–3.21)	0.19	3.37 (1.22–9.34)	0.019*
Recent appearance	1		1	
Personal history of skin cancer				
No	1.30 (0.92–1.82)	0.13	1.38 (0.89–2.13)	0.15
Yes	1		1	

[a]Continuous variable
BCC: basal cell carcinoma; SCC; squamous cell carcinoma; 95% CI: 95% confidence interval; OR: odds ratio. *Statistically significant.

mily and relatives is essential. In this study, the presence of symptoms, such as bleeding, was associated with increased detection of the lesion by family members or relatives, while the absence of symptoms was associated with decreased detection by patients. Other publications indicate that the most advanced and symptomatic stages of tumours are the ones that patients and their social environment can appreciate most easily (9, 11, 12). However, concern about a malignant lesion includes perceptions that often go beyond the associated symptoms. Schmid-Wendtner et al. (13) reported that 29.2% of patients waited more than 1 year before consulting a physician about a self-observed change. Despite being on the margins of the analysis performed, all these factors, combined with the initially benign appearance and low impact on quality of life of early-stage tumours, may delay consultation and subsequent diagnosis, even though the lesions are on the surface of the skin and potentially identifiable. In the current study, patients, family members and relatives who did not know the evolution of the lesion showed a negative tendency to detect the lesion. These findings may confirm the hypothesis that people who are aware of skin changes may be less likely to delay seeking medical attention (12). In light of these concerns, it is important to consider the role of teledermatology in the absence of a skin cancer screening recommendation in the general population. In addition to the assessment and triage of patient-detected lesions, teledermatology may provide a supplementary and cost-effective method for the massive detection and short-term monitoring of suspicious lesions. However, clinical studies are needed to support the role of teledermatology in skin cancer screening (13, 14).

Several factors should be taken into account that could act as limitations to the detection of skin lesions by patients and their families, which are difficult to quantify, and which could favour detection by professionals; hence these results may underestimate the difficulty of detection by patients and families. Due to their training, physicians are more likely to be aware of high-risk lesions and use additional technologies, such as dermoscopy, to perform an examination and have better opportunities to examine locations that are difficult for the patient to assess (5) in comparison with patients and their relatives. Therefore, it is crucial to emphasize that physician screening strategies, combined with the involvement of the patient and their social environment, must be maintained and implemented to ensure early diagnosis of skin cancer (11, 12, 15). Educational messages to the general population should emphasize the importance of self-examination in the early detection of malignant lesions.

The authors have no conflicts of interest to declare.

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