Differences in the management of melanoma by dermatologists and general practitioners in primary care

Diferencias en el manejo del melanoma por dermatólogos y médicos generales en atención primaria

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Abstract

Introduction: Melanoma is a serious health problem . Early detection of melanoma is believed to improve survival dramatically.
Objective: To evaluate the differences between general practitioners and dermatologists in the care of patients with melanoma.
Methods: A cross-sectional survey-based study was conducted with a random sample of 30 photographs of pigmented lesions with known pathology by 101 dermatologists and 115 primary care physicians.
Results: The correlation between the perceived probability of melanoma and the dermatologists' decision to biopsy a lesion was 0.91 (P < 0.001).
Conclusions: Dermatologists have better diagnostic accuracy and manage pigmented lesions than GPs.
Keywords: melanoma, skin cancer, primary care, general practitioners, dermatology. Source: DeCS
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Resumen
Introducción:El melanoma es un problema de salud grave .Se cree que la detección temprana del melanoma mejora drásticamente la supervivencia.
Objetivo: Evaluar las diferencias entre los médicos generales y los dermatólogos en la atención a pacientes con melanoma.
Método: Se realizó un estudio transversal basado en una encuesta con una muestra aleatoria de 30 fotografías de lesiones pigmentadas con patología conocida a 101 dermatólogos y 115 médicos de atención primaria.
Resultados:la correlación entre la probabilidad percibida de melanoma y la

decisión de biopsiar una lesión de los dermatólogos fue de 0,91 (P < 0,001).
Conclusiones: Los dermatólogos tienen mejor precisión diagnóstica y capacidad para manejar lesiones pigmentadas que los MG.
Palabras clave: melanoma,cáncer de piel, atención primaria, médicos generales, dermatología. Fuente:DeCS

Introduction

Melanoma is a serious health problem representing the fifth most common invasive cancer in men and the sixth most common in women. The incidence of melanoma continues to rise. Early detection of melanoma is thought to dramatically improve survival, as 5-year survival rates decrease dramatically with increasing tumor thickness and stage. The 5-year survival for stage I melanoma is 91% to 95% versus 7% to 19% for stage IV(1).

The standard screening method to prevent melanoma is a full-body skin examination by a healthcare professional. Unfortunately, many medical professionals other than dermatologists may not be specifically trained in the early detection of melanoma. For example, primary care general practitioners (GPs) are often expected to evaluate melanomas and only refer to dermatologists when there is a high clinical suspicion of melanoma. However, if GPs are not experts in melanoma diagnosis, early diagnosis and treatment opportunities may be missed. Conversely, the morphology of benign pigmented lesions can often mimic that of early melanomas, resulting in potentially unnecessary dermatologic referrals, biopsies, and patient anxiety(2).

A few prospective studies have evaluated the diagnostic accuracy of fully trained primary care physicians and dermatologists for pigmented lesions. However,several features limited them: they only calculated sensitivity, did not evaluate appropriate management (biopsy or referral) and did not account for the variability of random sampling error(3). This last problem refers to the fact that the study's patients (or photos) and assessors (physicians) are drawn from a sample that may introduce sampling error and variability in diagnostic accuracy measurements. Most studies were also limited by small sample sizes and lacked statistical power. A recent one showed that the cumulative data were insufficient to support the superiority of dermatologists or the suitability of GPs to accurately diagnose or adequately manage pigmented lesions(4).

The study was designed to address the limitations of previous studies and to answer more definitively whether there is a difference between dermatologists and primary care physicians in the management of suspicious pigmented lesions and the diagnosis of melanoma.

Method

A cross-sectional survey-based study was conducted with a random sample of 30 photographs of pigmented lesions with known pathology to 101 dermatologists and 115 primary care physicians from October 2020 to January 2021. This was done through personal contacts and local, state and regional physician group meetings. This study was approved by the Universidad Regional Autónoma de Los Andes (UNIANDES).

The survey instrument consisted of a notebook containing 30 5 × 7-inch photographs of pigmented lesions, 5 photographs in each of the following categories: thin melanomas (≤0.75 mm Breslow thickness), medium-thickness melanomas (1 to 4 mm), thick melanomas (>4 mm), compound nevi, seborrheic keratoses, and hemangiomas. At the time of selection, an acral lentiginous melanoma was included in the thin melanoma category. However, the thickness of the lesion was unknown, so it did not include this photo in any of our subgroup analyses.

For each photo, dermatologists were asked two questions: (A) the likelihood that the lesion should be biopsied and (B) the likelihood that the lesion is a melanoma. Primary care physicians were asked the same questions, except that the first question was the likelihood that the lesion would be referred to a dermatologist. Participants recorded their responses on a scale of 1 to 10. For part A, answering a “1” meant the physician would not biopsy or refer, and a “10” meant they would take action. For part B, answering a “1” meant the lesion had the lowest probability of being melanoma and a “10” meaning the lesion had the highest probability.

After giving verbal consent, participating physicians were given the photographic survey and asked questions about their demographics, dermatology training, current practice and comfort, and frequency of skin cancer detection. For GPs, their area of practice and their tendency to biopsy lesionswere also asked.

Missing data were imputed by averaging participant responses for lesions of similar type. Data were imputed for 20 GPs (17%) and 19 dermatologists (18%). However, this represented only 1.1 % and 1.5 % of the questions for primary care physicians and dermatologists, respectively. Therefore, 3 GPs and 4 dermatologists were excluded because incomplete data could not be imputed.

The accuracy of melanoma diagnosis and appropriateness of lesion treatment were compared for primary care physicians versus dermatologists by calculating the area under the curve (ABC). By comparing participant responses on the 1-10 agreement scale to the gold standard pathology report, it calculated sensitivities and specificities for each response cutoff point. Curves were generated for each physician by plotting the “sensitivity” times “1 minus specificity” for each cutoff point.

The database and statistical processing of the data were performed and analyzed in the statistical program SPSS 26 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used for the results collection, presentation and interpretation.

Analysis of covariance (ANCOVA) was used to assess the relationship between diagnostic and management accuracy to account for the hierarchical structure of the data. In addition, demographic data were analyzed using analysis of variance (ANOVA) for continuous data and logistic regression for dichotomous data to account for the nesting of physician type within sites.

Results

A total of 223 physicians participated in the study; however, 4 dermatologists and 3 GPs were excluded due to incomplete data. Of the 216 physicians included in the final analyses, 47% (101) were dermatologists. There were no statistically significant differences between GPs and dermatologists for the following characteristics: sex, length of practice, and a number of days per week seeing patients. Dermatologists were more comfortable with screening and more frequently examined their patients for skin cancer. None of the physician type × site interactions were statistically significant (P>0.05).

For dermatologists, the correlation between the perceived likelihood of melanoma and the decision to biopsy a lesion was 0.91 (P< 0.001). In other words, dermatologists chose to biopsy if they were more certain that the lesion was a melanoma but did not choose to biopsy if they thought the lesion was less likely to be a melanoma. For MAPs, the correlation was also positive, but only 0.68 (P< 0.001), indicating a lower concordance between the perceived likelihood that the lesion was melanoma and the decision to refer. The difference between the two correlations was statistically significant (P< 0.001).

There is more significant variability among primary care physicians than dermatologists in diagnosing and treating pigmented lesions, as demonstrated by the ABA variance ratio in Table 1. For example, the variance for the biopsy/referral question was 1.5 times greater for primary care physicians than dermatologists and more than 2.5 times greater for the diagnosis question.

Table 1. Estimated ABCs for physician types and melanomas.

Typeof	Ask	ABC Dermatologists	ABC MG (95 % CI)	P-value	MG to ABC

Melanoma		(95 % CI)			Dermatologist Ratio Variance
Thick	Biopsy/referral Diagnosis	0,92 (0,88 a 0,96) 1,00 (0,98 a 1,00)	0,84 (0,76 a 0,93) 0,89 (0,85 a 0,93)	.005 < 0.001	2.20 5.56
Medium	Biopsy/referral Diagnosis	0,91 (0,88 a 0,95) 0,99 (0,97 a 1,00)	0,84 (0,76 a 0,92) 0,89 (0,84 a 0,94)	004 lt;.001	2.22 4.53
Delgado	Biopsy/referral Diagnosis	0,69 (0,68 a 0,70) 0,70 (0,69 a 0,71)	0,61 (0,56 a 0,66) 0,62 (0,56 a 0,68)	< 0.001 < 0.001	1.38 1.61
All	Biopsy/referral Diagnosis	0,84 (0,81 a 0,87) 0,89 (0,88 a 0,91)	0,76 (0,69 a 0,83) 0,80 (0,75 a 0,84)	< 0.001 < 0.001	1.54 2.70

Source: Own elaboration based on statistical analysis,p ≤ 0,05

For both questions, the ABC was significantly higher (P < 0.001) for dermatologists than for GPs. When looking at melanomas by thickness, the ABC remained significantly higher for dermatologists. However, for dermatologists and GPs, the ABC for thin melanomas was substantially lower than for medium and thick melanomas.

The study analyzed whether certain characteristics of GPs correlated with better diagnostic accuracy or more appropriate management. It was found that the ABC for the biopsy/referral question was significantly higher for those GPs who tended to biopsy lesions themselves (ABC = 0.85 vs. ABC = 0.74, *P* = 0.002), on par with dermatologists (ABC = 0.84, *P* = 0.67). For the diagnostic question, the difference between the 2 MAP groups was not significant. In addition, dermatologists were superior to APMs who favored biopsy (ABC = 0.895 vs. ABC = 0.846, *P* = 0.002). Those GPs who performed lesion biopsies themselves were more likely to have completed a dermatology rotation during residency (79 % vs. 31 %, *P* <0.0001) but not more likely to have completed a rotation during medical school (61 % vs. 63 %, *P* = 0.55). However, when it looked at dermatology training for all primary care physicians during residency, there was no significant ABC correlation for any of the questions. Even when evaluating only the more subtle thin melanomas, dermatology training for PAMs did not correlate significantly with a higher ABC.

Discussion

With the increasing incidence of melanoma in Ecuador, there is a need for accurate early diagnosis. While technologies, such as computerized dermoscopy, are evolving in this effort, the current gold standard remains a skin examination. This study suggests that dermatologists have better diagnostic accuracy and ability to manage pigmented lesions, given the tradeoffs of sensitivity and specificity. Even with the more subtle thin melanomas, dermatologists outperform GPs in diagnostic accuracy and treatment appropriateness.

When noting the correlation between diagnostic accuracy and the management decision to biopsy or refer, dermatologists had a higher agreement between their assessment that the lesion was melanoma and the likelihood that they would biopsy the lesion. Conversely, even when primary care physicians had a lower suspicion of melanoma, they were still inclined to refer the patient to a dermatologist. For GPs, this may be a good thing; along with benign lesions, they can refer to some of the thin melanomas that would otherwise have been missed[5]. However, this also creates a higher referral volume and burden for dermatologists[6,7].

Compared with dermatologists, there was more significant variation among GPs in diagnostic accuracy and ability to treat pigmented lesions. When it compared primary care physicians who tended to biopsy lesions themselves with those who tended to refer, it was found that those who performed biopsies had superior diagnostic accuracy and appropriate management, almost on par with dermatologists[8,9]. These GPs were more likely to have received dermatology training during residency, but that alone did not correlate with higher diagnostic accuracy. It may be that because these physicians often managed pigmented lesions on their own, they honed their clinical diagnostic skills[10,11].

This study has several limitations. First, pigmented lesions were presented to physicians through photographs. Unlike dermatologists, GPs are not routinely trained and tested with photographs. Lesions in live patients would be preferable as they are three-dimensional and can be palpated. Another limitation is that it does not provide patient histories to accompany the photographs. Physicians might have been influenced in their decision to act on a lesion if they knew the duration of the lesion and the patient's melanoma risk factor profile. In addition, the physicians who completed our survey represent a convenience sample, which could have introduced selection bias. The study is further limited because it did not have subjects committed to an action (to refer or not to refer, to biopsy or not to biopsy). Ultimately, the management decision is dichotomous and can only be genuinely evaluated when the physician is confronted with an actual patient[12]. Finally, the management questions for the two types of physicians are different (biopsy vs. referral). However, the question aimed to assess how well physicians manage suspicious lesions.

Despite the limitations of this study, our data provide valuable information for health policymakers. At the same time, dermatologists may have the greatest skill in performing whole-body skin examinations, most early melanomas present to GPs. In addition, there is currently a shortage of dermatologists to meet the existing demand ([13,14]. Because of the increasing incidence of melanoma in Ecuador, dermatologists are unlikely to provide the workforce to meet the demand for accurate melanoma screening. Therefore, efforts to increase the early detection of melanoma should focus on improving the ability of GPs to perform skin cancer screening and developing approaches that do not include GPs.

Primary care physicians have a unique opportunity to screen for skin cancer, given the many patients seen for routine health examinations. Therefore, one way to improve GP's diagnostic skills is to increase the amount of dermatology training in medical school and residency[15,16]. However, our analyses demonstrated that 1 to 4 weeks of dermatology training does not affect primary care physicians' diagnostic accuracy of pigmented lesions.

Therefore, other innovative strategies are needed to train primary care physicians to manage pigmented lesions and improve skin cancer detection. For example, an Internet-based program is a new approach that has proven effective in training GPs[17,18]. However, because GPs have limited time to manage many medical problems, early detection strategies must be targeted outside the GPs set. Some promising approaches include public education campaigns such as the one in Australia and genetic testing for melanoma[19,20]. All of these efforts promise to improve the early detection of melanoma, thereby improving survival from this devastating cancer.

Conclusions

Dermatologists have better diagnostic accuracy and ability to manage pigmented lesions than GPs. However, there is a shortage of dermatologists to meet the demand for accurate melanoma detection. Therefore, more innovative strategies are needed to train GPs and improve skin cancer detection.

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