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Journal
Dermatology Online Journal, 20(2)

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Publication Date
2014

DOI
10.5070/D3202021537

Volume 20 Number 2
February 2014

Commentary

Compliance with follow-up among patients with melanoma and non-melanoma skin cancers

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Dermatology Online Journal 20 (2): 4

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Abstract
Background: A history of cutaneous malignancies puts patients at an increased risk of developing additional skin cancers, but there is little data available regarding compliance with any recommended follow-up regimens.

Purpose: To report on compliance with physician recommended follow-up regimens among patients diagnosed with melanoma and non-melanoma skin cancers.

Methods: 105 patients with cutaneous melanoma and 1151 patients with non-melanoma skin cancers diagnosed between December 1996 and December 2001 were identified through biopsy records. The records of all identified patients were then retrospectively reviewed for compliance with physician recommended follow-up regimens over a 60-month period.

Results: At 60 months following initial diagnosis, 22.6% of melanoma patients and 19.3% of non-melanoma patients were still continuing follow-up examinations. However, only 10.5% of melanoma patients and 7.2% of non-melanoma patients were compliant with the recommended follow-up schedule. Among melanoma patients, Breslow thickness correlated positively with duration of follow-up ($P = 0.03$). The frequency of additional primary non-melanoma and melanoma skin cancers was positively correlated with duration of follow-up among patients with non-melanoma skin cancers ($P \leq 0.001$).

Conclusions: Patient compliance with physician recommended follow-up regimens is generally poor; further research and intervention is necessary to identify and address the underlying causes.

Keywords: Melanoma; Basal Cell Carcinoma; Squamous Cell Carcinoma; Non-melanoma Skin Cancer; Medicine; Dermatology

Introduction

Skin cancers are the most common malignancies in humans and their incidence has been rising steadily for the past several decades [1, 2]. More than one million skin cancers are diagnosed annually in the United States [2], with basal cell and squamous cell carcinomas accounting for the vast majority of cases. It is estimated that up to 20% of Americans will develop a cutaneous malignancy during their lifetime [3].

A history of skin cancer puts patients at an increased risk of developing subsequent skin cancers. Patients with a history of non-melanoma skin cancer are at an elevated risk of developing additional malignancies; the three-year risk of developing a subsequent basal cell carcinoma is 44% [4], whereas the three-year risk of developing a subsequent squamous cell carcinoma is

18% [4]. Similarly, the risk of a second melanoma is increased in patients with a prior history of melanoma, with estimates of cumulative risk ranging from 2-5% over periods of 5 to 20 years following the initial diagnosis [5-7].

Although studies have shown that melanomas detected by physicians are significantly thinner than those detected by the patients themselves [8-11], there currently is no single, universally agreed upon follow-up schedule for either melanoma or non-melanoma skin cancer patients. For melanoma patients, the American Academy of Dermatology recommends follow-up one to four times per year, depending on Breslow thickness of the lesion and other risk factors, for the first two years after diagnosis and then one to two times yearly thereafter [12]. Follow-up interventions should include thorough history and physical examination, including a total body mucocutaneous exam [12]. The National Comprehensive Cancer Network bases its follow-up guidelines on the stage of the primary tumor. Patients with stage 0 disease (melanoma in situ) are recommended to have annual full skin exams for life; those with stage IA (tumor of <1.00 mm thickness without mitoses or ulceration) to IIA disease (tumor of 1.01-2.0 mm thickness with ulceration, or 2.01-4.0 mm thickness without ulceration) are recommended to have examinations every 3-12 months for the first five years following initial diagnosis, then annually thereafter; patients with stage IB (tumor of <1.00 mm thickness with >1 mitoses or ulceration, or 1.01-2.00 mm thickness without ulceration) to stage IV disease (distant metastasis) are recommended to have examinations every 3-6 months for the first two years, then every 3-12 months for the next two years, then annually thereafter [13]. For patients with a history of non-melanoma skin cancers, it is typically recommended that that they undergo follow-up skin examinations once or twice yearly [14, 15] and perform monthly self-exams. Such self-surveillance is imperative because it has been linked to the earlier detection of thinner melanomas [8]. Studies have shown that up to 67% of initial recurrences in patients with stage II/III cutaneous melanoma were either symptomatic or were detected by the patient themselves; only 26% were detected by a physician on follow-up examination [16].

There is little data available regarding patient compliance with any of the recommended follow-up regimens. The aim of this study was to report on the compliance with physician directed follow-up among patients with both melanoma and non-melanoma skin cancers.

Methods

Patients were retrospectively identified through the biopsy records of the Department of Dermatology at Rush University Medical Center. Potentially eligible cases for the present study were individuals with an initial diagnosis of cutaneous melanoma, basal cell carcinoma, or cutaneous squamous cell carcinoma between December 1996 and December 2001. Patients with both in situ and invasive lesions were included. The records of all identified patients were then retrospectively reviewed for compliance to physician recommended follow-up regimens over a 60-month period.

In accordance with American Academy of Dermatology guidelines, follow-up visits were scheduled every three months for the first two years following the initial diagnosis of cutaneous melanoma, every 6 months for the next two years, and annually thereafter. For non-melanoma patients, follow-up visits were scheduled at six months following initial diagnosis, then yearly thereafter. Patient records were regularly reviewed, and patients were sent postcards reminding them to make follow-up appointments. Patients were considered lost to follow-up if they failed to respond to these written reminders and did not make or keep any subsequent follow-up appointments. A number of patients indicated that they would continue follow-up with other physicians at different institutions; these patients were not considered lost to follow-up, but no subsequent follow-up data was available for them. Consequently, these patients were excluded from the statistical analysis.

Patients were considered compliant with the recommended regimen if they returned for follow-up within 2 months of the expected follow-up date based on their initial date of diagnosis. Whenever there was a discrepancy of more than two months between expected and actual follow-up dates (e.g. if a patient were to return after more than 14 months for an annual appointment), the patient was considered non-compliant with the recommended regimen.

Data were analyzed with Statistical Package for the Social Sciences (SPSS). All data are presented as means and standard deviations (SD) unless otherwise noted. For the purposes of analysis, patients with in situ melanomas were regarded as having tumors with a Breslow thickness of 0 mm. All given P values are two tailed and a value of less than 0.05 was considered statistically significant.

Results

Malignant Melanoma

A total of 128 patients with cutaneous melanomas were initially identified. However, of these patients, 23 stopped follow-up at Rush University Medical Center but reported that they would be continuing follow-up at another institution or with another dermatologist; these patients were subsequently excluded from the statistical analysis.

The remaining 105 patients (57.1% male, mean age: 55.8 years, SD 17.2 years) with cutaneous melanoma were included in the analysis. Mean Breslow thickness was 0.38 mm (SD 0.90 mm). The melanomas were located on the head and neck in 33 (31.4%) of the patients, on the trunk in 43 (41.0%) of the patients, on the upper extremities in 15 (14.3%) of the patients, and on the lower extremities in 13 (12.4%) of the patients. Tumor location was not clearly specified in one patient.

A total of 58 patients (55.2%) were lost to follow-up during the 60 months following diagnosis. A total of 24 patients (22.9%) continued follow-up for a full 60 months following diagnosis of their primary tumor. Of those patients, only 11 (10.5%) were compliant with the recommended schedule as well. There was no statistically significant correlation between age (Pearson correlation coefficient = -0.13, P = 0.23) or sex (P = 0.94) and duration of follow-up. However, there was a significant positive correlation between Breslow thickness and follow-up duration (Pearson correlation coefficient = 0.25, P = 0.03) (**Figure 1**).

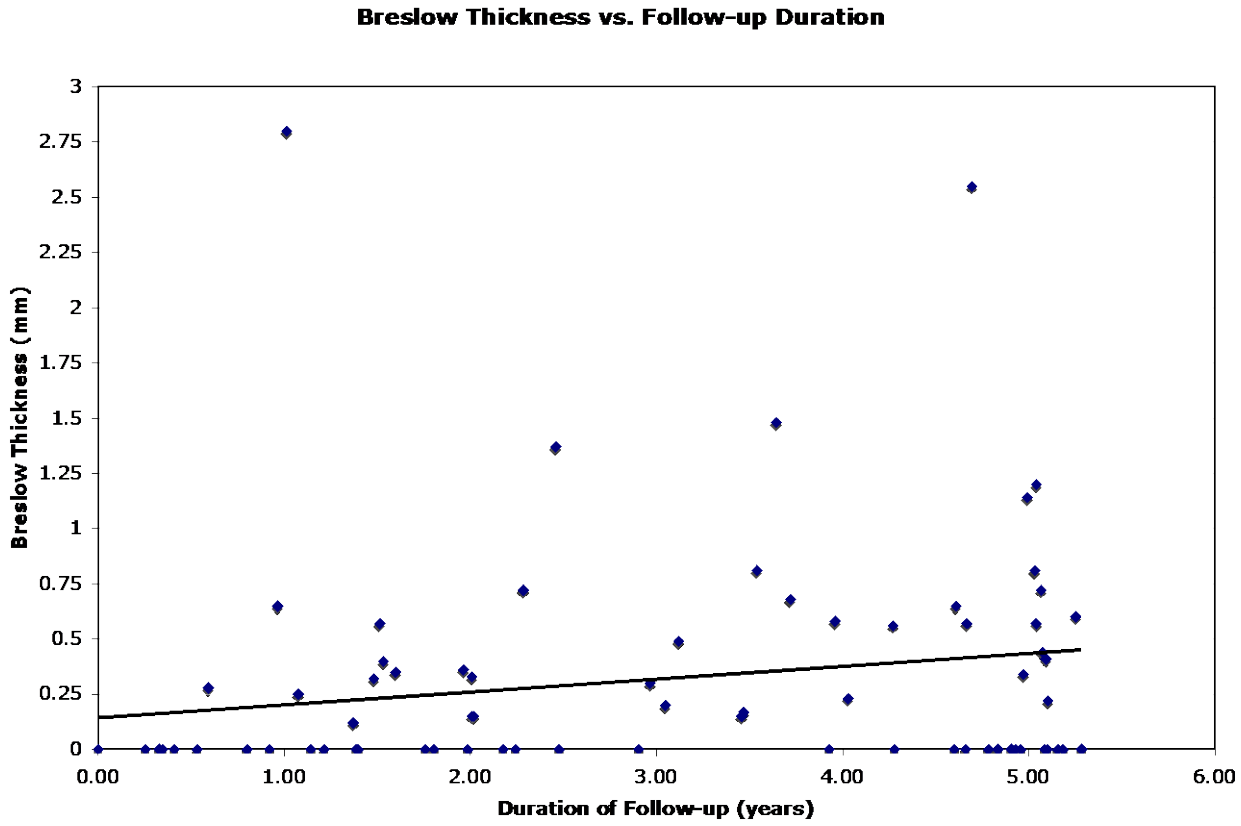

Figure 1. Breslow thickness, in millimeters, as a function of follow-up duration, in years

A total of 3 patients developed a recurrence of their primary tumor following excision. Two of those patients were fully compliant with follow-up for all 5 years and one was lost to follow-up after 3 years. Three patients developed a subsequent second melanoma and one patient developed three additional melanomas. Another 12 patients developed other non-melanoma tumors during the course of follow-up.

Non-melanoma skin cancers

A total of 1366 patients with non-melanoma skin cancers were initially identified. Of these patients, 215 stopped follow-up at Rush University Medical Center but reported that they would be continuing follow-up at another institution or with another dermatologist; these patients were subsequently excluded from the statistical analysis.

The remaining 1151 patients (47.2% male, mean age 64.8 years, SD 14.9 years) with non-melanoma skin cancers were included in this analysis. This included 920 (79.9%) cases of basal cell carcinoma and 231 (20.1%) cases of cutaneous squamous cell carcinoma. The tumors were located on the head and neck in 697 (60.6%) patients, on the trunk in 240 (20.9%) patients, on the upper extremities in 107 (9.3%) patients, and on the lower extremities in 70 (6.1%) patients. On initial presentation, 33 (2.9%) patients had more than one primary, non-melanoma tumor. The location was not clearly specified in 4 patients.

A total of 714 (62.0%) patients were lost to follow-up over the 60 months following initial diagnosis. A total of 222 patients (19.3%) continued follow-up for a full 60 months following initial diagnosis. Of those patients, only 83 (7.2%) were compliant with the physician recommended schedule as well. As with melanoma patients, there was no significant relationship between age (Pearson correlation coefficient = 0.003, P = 0.93) or sex and follow-up duration (P = 0.51).

A total of 21 (1.8%) of patients developed a recurrence of their primary tumor following excision or Mohs micrographic surgery. There was no correlation between development of recurrences and duration of follow-up (Pearson correlation coefficient = 0.06, P = 0.07). Furthermore, 23.2% of patients developed at least one additional basal cell carcinoma and 10.8% developed at least one additional squamous cell carcinoma; one patient developed a total of 11 additional lesions over 60 months. There was a positive correlation between number of additional basal cell carcinomas and duration of follow-up (Pearson correlation coefficient = 0.36, $P \leq 0.001$) and between number of additional squamous cell carcinomas and duration of follow-up (Pearson correlation coefficient = 0.25, $P \leq 0.001$). A total of 10 patients developed at least one subsequent cutaneous melanoma; there was also a positive correlation between number of additional melanomas and follow-up duration (Pearson correlation coefficient = 0.15, $P \leq 0.001$).

Discussion

In our cohort, the number of patients lost to follow-up or who were not compliant with the physician recommended follow-up regimen was quite high. Among melanoma patients, only 22.6% continued follow-up for the full 60-month period and only 10.5% were fully compliant with the recommended regimen. Non-melanoma patients had even lower rates of compliance, with only 7.2% fully compliant at 5 years. These figures are far lower than those reported in a prior study examining compliance with follow-up among skin cancer patients. In a 2001 study conducted at the University of Vienna, Kittler et al found that 55.3% of patients with thin melanomas (defined as Breslow thickness of less than 1.5 mm) continued follow-up over a five-year period. Of those who continued follow-up, 50.2% were not compliant with the recommended schedule [10]. However, it is important to note that our study enforced a significantly more stringent follow-up regimen. Kittler et al considered patients compliant if they had just one annual follow-up examination [17]. Even if we apply the follow-up criteria used by Kittler et al to our own melanoma cohort, only 18.1% of patients would be considered compliant with the recommended schedule.

We also demonstrated a positive correlation between Breslow thickness and compliance with follow-up among melanoma patients. Interestingly, Kittler et al did not find any such correlation in their cohort [17]. Unfortunately, despite the positive correlation in our cohort, overall compliance rates were low and there was considerable variability in overall follow-up durations, even in patients with thicker tumors.

In patients with non-melanoma skin cancers, we also found a positive correlation between the development of subsequent melanomas, basal cell carcinomas, and squamous cell carcinomas and duration of follow-up. Although this does not definitively establish effectiveness of our specific follow-up regimen, it does demonstrate the importance of continued, longitudinal screening for the development of additional malignancies in these patients.

The limitations of our study include its retrospective design and the relatively small cohort of melanoma patients. Furthermore, we did not investigate the reasons for discontinuing follow-up. Considering the fact that a majority of our cohort was lost to follow-up, this definitely should be a topic for future research and intervention.

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