Evaluation of sun protection behaviour in patients following excision of a skin lesion

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The present prospective study evaluated sun exposure and sun protection behaviours in patients diagnosed with a precancerous or cancerous skin lesion. Following signed informed consent, patients were given a questionnaire regarding sun protection and sun exposure behaviour. There were 50 patients (27 men, 23 women) with a mean age of 59 years. Following diagnosis of a cancerous or precancerous lesion, there was a significant increase ($P<0.001$) in sunscreen use, use of sun protection factor greater than 30, wearing a hat and avoidance of sun between 10:00 and 14:00. There were significantly more women who used sunscreen ($P=0.04$) and limited daily activities ($P=0.03$). There were significantly more patients with nonmelanoma lesions who wore hats ($P<0.04$) and more patients with melanoma who limited daily activities ($P<0.04$). While many patients in the present study did alter their sun protection and exposure behaviour, there were many patients who continued in risk-taking sun behaviour. Therefore, patients with precancerous or cancerous skin lesions who are not compliant with sun protective behaviour may benefit from more comprehensive patient education to encourage better sun protection behaviour.

Key Words: Cancer; Skin; Sun protection

Malignant skin lesions are the most common diagnosis of cancer, and recent data indicate a rising incidence of skin cancer in North America (1,2). Sun exposure has been identified as a primary risk factor for the development of cancerous skin lesions, and education programs have been implemented to encourage patients to avoid sun exposure, particularly following a diagnosis of skin cancer (1-7). Previous studies have indicated some compliance with sun protection behaviours in patients diagnosed with skin cancer and/or after patient education; however, there appear to be many patients who do not comply with these recommendations (1,4-6).

The purpose of the present study was to evaluate sun exposure and sun protection behaviour in patients diagnosed with a precancerous or cancerous skin lesion.

PATIENTS AND METHODS

Patients who were diagnosed with a cancerous or precancerous skin lesion, and who were being seen for follow-up by their plastic surgeon, were invited to participate in the present study. Following Research Ethics Board approval and signed informed consent, patients were given a short questionnaire regarding their sun protection and sun exposure behaviour. The primary outcome measures were sun exposure and sun protection factors: sunscreen usage, sun protection factor (SPF) of sunscreen

Évaluation du comportement à l'égard de la protection solaire chez des patients ayant subi l'exérèse d'une lésion cutanée

La présente étude prospective a porté sur l'évaluation du comportement des patients à l'égard de l'exposition au soleil et de la protection solaire après la pose d'un diagnostic de lésions cutanées cancéreuses ou précancéreuses. Les patients ont d'abord signé un formulaire de consentement éclairé, puis ont répondu à un questionnaire sur leur comportement à l'égard de l'exposition au soleil et de la protection solaire. Cinquante patients (27 hommes et 23 femmes), âgés en moyenne de 59 ans, ont participé à l'étude. Après la pose du diagnostic de lésions cutanées cancéreuses ou précancéreuses, il y a eu une augmentation importante ($P<0,001$) de l'utilisation d'écrans solaires, de l'application de produits ayant un facteur de protection solaire supérieur à 30, du port du chapeau et de la non-exposition au soleil entre 10 h et 14 h. Beaucoup plus de femmes que d'hommes faisaient usage d'écrans solaires ($P=0,04$) et restreignaient leurs activités quotidiennes ($P=0,03$). Un nombre significativement élevé de patients atteints de lésions non mélanomateuses portaient un chapeau ($P<0,04$) et plus de patients atteints de lésions mélanomateuses ont limité leurs activités quotidiennes ($P<0,04$). Même si un grand nombre de participants à l'étude ont modifié leur comportement à l'égard de l'exposition au soleil et de la protection solaire, beaucoup d'autres ont continué à s'exposer dangereusement au soleil. Ainsi, les patients atteints de lésions cutanées cancéreuses ou précancéreuses, qui ne modifient pas leur comportement à l'égard de la protection solaire profiteraient peut-être d'une éducation plus globale en la matière afin d'adopter un comportement plus sûr.

applied, use of protective clothing and limited outdoor activity because of their diagnosis. Patients were asked about these factors before and after their diagnosis of a cancerous or precancerous skin lesion, and each response was ranked on a five-point Likert scale (ie, always, almost always, sometimes, rarely or never).

Data were entered into a spreadsheet and the data analyses were performed using SPSS Version 11.0.1 (SPSS Inc, USA). McNemar's test was used to evaluate the changes in behaviour before and after diagnosis. Fisher's exact test or χ^2 analyses were used to evaluate the differences between patients with melanoma and precancerous or other cancerous lesions and sun protection behaviour. For statistical analysis, because of the low number of responses in some categories, the responses were grouped as a positive response (always and almost always) or negative response (sometimes, rarely and never).

RESULTS

There were 50 patients (27 men and 23 women) included in the study with a mean age of 59 ± 13 years. The patients with melanoma (mean age 53 ± 12 years) were significantly younger than the nonmelanoma patients (mean age 63 ± 12 years) ($P=0.004$). The diagnoses included melanoma ($n=21$), basal cell carcinoma ($n=20$), squamous cell carcinoma ($n=5$), actinic keratosis ($n=2$) and dysplastic nevus ($n=2$). Four patients reported that they smoked.

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Figure 1) Distribution of patient responses regarding sunscreen, hat use and sun activities after diagnosis of a cancerous or precancerous skin lesion

Figure 2) Comparison of sunscreen use, sun protection factor (SPF) greater than 30 and hat use before and after diagnosis of a cancerous or precancerous skin lesion

The lesions were located on the head ($n=29$), leg and foot ($n=8$), arm ($n=5$), back ($n=4$) and chest ($n=4$). Following excision of the skin lesion, reconstruction was necessary to close the skin in 15 patients and the remaining incisions were closed primarily using standard suture technique. Twenty-nine patients reported that the appearance of the scar did not bother them and the majority of the patients ($n=43$) reported that they were very satisfied ($n=31$) or satisfied ($n=12$) with the excision.

Sun protection and avoidance behaviours

The majority of patients reported that, following diagnosis of a cancerous or precancerous skin lesion, they always or almost always wore sunscreen, wore a hat, restricted activities in the sun and avoided the sun between 10:00 and 14:00 (Figure 1). Following their diagnosis, there were significantly more patients who reported wearing sunscreen ($P<0.001$) (Figure 2) and this was more prevalent in women ($P=0.007$) (Figure 3). There were significantly more patients who reported wearing sunscreen with an SPF of 30 or higher ($P<0.001$) (Figure 2) and again this was more frequent in women ($P=0.038$) (Figure 3). There were significantly more patients who reported wearing a hat following their diagnosis of a cancerous or precancerous lesion ($P<0.001$) (Figure 2). Those patients with nonmelanoma lesions were significantly more likely to wear a hat ($P=0.04$) (Figure 4). There were significantly more patients who reported that they avoided the sun between the hours of 10:00 and 14:00 and avoided

Figure 3) Comparison of sunscreen use, sun protection factor (SPF) greater than 30 and hat use in men and women after diagnosis of a cancerous or precancerous skin lesion. There were significantly more women who reported using sunscreen and an SPF greater than 30 ($P<0.04$)

Figure 4) Comparison of sunscreen, sun protection factor (SPF) greater than 30 and hat use in patients with melanoma versus non-melanoma after diagnosis of a cancerous or precancerous skin lesion. There were significantly fewer patients with melanoma who reported wearing a hat ($P=0.04$)

Figure 5) Comparison of patients who limited daily activities after diagnosis of a cancerous or precancerous skin lesion. There were significantly more patients with melanoma and women who reported that they had limited their daily activities due to their diagnosis ($P<0.04$)

sun-related activities ($P<0.001$) (Figure 2). Patients with melanoma were significantly more likely to limit their daily activities due to their diagnosis ($P=0.04$) and this was more frequent in women ($P=0.03$) (Figure 5).

DISCUSSION

Sun exposure has been identified as a risk factor for the development of cancerous skin lesions, and previous studies have reported a positive relationship between sun exposure

and the development of these neoplasms (1,2,7). While specific education programs have been developed in some areas, particularly in regions with a high prevalence of cancerous skin lesions, most individuals are aware of the dangers of sun exposure and its link to the development of skin cancers.

While many patients have followed recommendations for sun protection following a diagnosis of a cancerous skin lesion, it appears that some groups of the population have been more compliant than others in adherence to decreasing sun risk behaviours. Rhee et al (8) followed 121 patients after Moh's surgery for a cancerous skin lesion and reported a significant increase in sun protection behaviour following the diagnosis. They noted that older patients were more likely to avoid the mid-day sun ($P<0.009$) and men were more likely than women to stay out of the sun ($P<0.002$). In our sample, we found similar results, with women being more compliant with sun protection behaviours. In contrast to the results reported by Rhee et al (8), Robinson (9) found a lower rate of compliance with sun protection behaviours in elderly individuals.

Education is commonly advocated as a method of altering patient behaviour and of decreasing participation in activities that increase the risk of developing cancerous skin lesions. Freiman et al (5) evaluated 217 patients who had been diagnosed with melanoma to assess if they had altered their sun protection behaviours following their diagnosis. The authors reported that patients received more sun-related advice following a diagnosis of melanoma and that patients reported an increase of sun awareness and sun protection following this education (5). Robinson (9) evaluated 1042 people with non-melanoma skin lesions and followed these patients over a one-year period following excision of the neoplasm. During this period of time, patients were given information regarding sun protection behaviours. The study reported a relatively low rate of compliance with sunscreen use (62%) following their education program and this was more prevalent in patients older than 65 years of age. Owen et al (10) evaluated knowledge attitudes and sun behaviour in adults in Northern Ireland. The authors reported that older aged individuals had poorer sun knowledge; skin checks were not routinely performed; and many individuals still viewed a suntan as healthy, important or attractive. It appears that education programs may not be effective in altering sun behaviours and beliefs, and that perhaps these programs need to be altered and targeted to specific groups.

Many of the education and behavioural programs have been targeted to adolescents and children to achieve early intervention in sun protection behaviours and beliefs. Bauer et al (11) reported an interventional study to decrease the incidence of melanocytic nevi in 1232 German children. The authors investigated the efficacy of education and free sunscreen on decreasing the incidence of melanocytic nevi three years following their intervention. They found few changes to sunscreen behaviour and none of the changes were attributed to their intervention; however, they found no difference in the number of melanocytic nevi. De Vries et al (12) evaluated sun protection behaviour and beliefs in Dutch adolescents and found that the adolescents with fair skin reported less sun exposure but more sunburns. Sunscreen use was the most frequently reported method of sun protection and was more prevalent in girls. Other methods of sun protection, including wearing protective clothing and avoiding the sun in peak sun hours, were less frequently

observed. Savona et al (13) evaluated the differences in sun exposure behaviours, sun protection and knowledge of sun exposure and cancer between Danish and American adolescents. The authors found that Danish youths and American and Danish girls were more likely to participate in sun tanning and tanning bed use ($P<0.001$), and Danish adolescents were less likely to wear a hat ($P<0.001$).

Our study sample consisted of adult patients, the majority of whom had been diagnosed with a cancerous skin lesion. Therefore, one might assume that these patients would be more motivated to avoid any behaviour that would increase their risk of developing another cancerous lesion. While many patients did follow sun protection behaviours and limited their sun exposure, there were many patients who did not comply with any precautions despite being diagnosed with a cancerous lesion.

CONCLUSION

While many patients in the present study did alter their sun protection and exposure behaviours, there were many patients who continued in risk-taking sun behaviours. Therefore, patients with precancerous or cancerous skin lesions who are not compliant with sun protective behaviour may benefit from more comprehensive patient education to encourage better sun protection behaviour.

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