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### An increase in sunscreen use in a population resistant to sun protection



*To the Editor:* Keratinocyte carcinoma (KC) is the most common malignant neoplasm diagnosed in the United States. Its incidence is increasing, and sunscreen use is a key tool to prevent it.<sup>1</sup> In this study, we describe sunscreen use among patients who were enrolled in the randomized, controlled Veterans Affairs Keratinocyte Carcinoma Chemoprevention (VAKCC) Trial.<sup>2</sup> Participants had heavily sun-damaged skin, defined as having at least 2 KCs in the 5 years before the trial. The study enrolled 932 patients with a mean age of 70 years. Most were male (98%) and white (99%). The median duration of follow-up was 2.8 years.

Characteristics of the participants were obtained by interview and examination at enrollment. They had semiannual counseling and visits, received free sunscreen, and were encouraged to use it. Analysis was performed with Stata 14.2 software (StataCorp LLC, College Station, TX).

Sunscreen use was significantly more common among participants who reported inability to tan, freckles, history of severe sunburns, age younger than 70 years, and residence in southern states. Of the sunscreen users, 90% reported using sun



**Fig 1.** Proportion of participants who reported never using sunscreen while outside during peak hours during the past week.

protection factor  $\geq 30$ . Our findings confirm that people who are more sun sensitive are more likely to use sunscreen.

At baseline, 71% of participants reported no sunscreen use while outside during peak hours during the past week, and only 19% reported using sunscreen 75% to 100% of the time during the week before enrollment (Fig 1). At 6 months, the proportion of patients who never used sunscreen dropped from 71% to 47%, and the number who almost always used sunscreen doubled from 19% to 37%.

Prior literature reports significant increases in sun protection after a history of skin cancer.<sup>3</sup> Only 19% of our population reported sunscreen use at baseline.

Another study observed only a 12% increase in sunscreen users after their consult intervention.<sup>4</sup> Their population was younger and mainly female.<sup>4</sup> We consider the increase we observed to be important, because our population was male and older, both of which have been associated with less sun protection.

Sunscreen use is affected by socioeconomic factors.<sup>5</sup> In our study, sunscreen provision was free, suggesting that no cost might have contributed to the noted increase.

Limitations include the homogenous veteran population and that the effects might not be observed outside of the setting of this trial.

Our results suggest that the combination of no cost with the follow-up and counseling involved in the participation of our trial may have been responsible for the increase in sunscreen use even in a population resistant to sun protection.

Appendix: Key personnel of the VAKCC Trial is available at <https://data.mendeley.com/datasets/8w3cy2txw6/draft?a=81889ed9-415a-4620-b37d-26b2a6d8e305>.

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### The association between vitiligo and diabetes mellitus: A systematic review and meta-analysis



**To the Editor:** Vitiligo is an acquired disorder of depigmentation resulting from a loss of cutaneous melanocytes.<sup>1</sup> Aside from cosmetic concerns, many genetic and epidemiology studies have demonstrated an association of vitiligo with several comorbid systemic diseases.<sup>2</sup> Diabetes mellitus (DM) is a chronic disease featuring an impaired ability to process blood sugar. The prevalence of

DM is increasing throughout the world, and its complications are associated with substantial morbidity and mortality.<sup>3</sup> To our knowledge, no large quantitative study has evaluated the association between vitiligo and DM; we therefore conducted this meta-analysis.

We identified all studies published before February 28, 2019, and included case-control studies describing the prevalence of DM in vitiligo patients and controls or the prevalence of vitiligo in DM patients and controls. Review articles, case series, and conference abstracts were excluded. The quality of each study was evaluated by using the Newcastle-Ottawa scale. A random effects model was used for the meta-analysis. Odds ratios (ORs) with 95% confidence intervals (CIs) were used to compare the prevalence of DM in patients with vitiligo and controls. Subgroup analyses were performed according to the type of DM (type 1, type 2, or mixed). Heterogeneity across studies was assessed using the  $\chi^2$  statistic and  $I^2$  statistic, and the risk of publication bias was assessed using the Egger test. All analyses were performed with Comprehensive Meta Analysis version 3 (Biostat, Englewood, NJ).

Nine studies with a total of 15,657 vitiligo patients met the inclusion criteria. A summary of the characteristics of included studies is shown in [Table 1](#). Seven studies reported the prevalence of DM (5 with mixed-type DM and 2 with type 1 DM) among vitiligo patients, and 2 studies reported the prevalence of vitiligo among type 2 DM patients. The pooled estimate of 9 studies showed that vitiligo was significantly associated with DM (OR 2.515, 95% CI 1.972-3.208;  $P < .001$ ; [Fig 1](#)). The subgroup analysis showed that vitiligo was significantly associated with type 1 DM (OR 2.899, 95% CI 1.532-5.482;  $P = .001$ ) and also type 2 DM (OR 2.371, 95% CI 1.712-3.283;  $P < .001$ ; [Fig 1](#)). No significant publication bias was noted ( $P = .66654$ ), and a leave-1-out sensitivity analysis also confirmed the robustness of our findings.

The significant correlation between vitiligo and type 1 DM might result from a similar pathogenesis of autoreactive cytotoxic T-cell-mediated destruction in both diseases.<sup>1,4</sup> Current results also showed that type 2 DM was comparably associated with vitiligo. Oxidative stress is thought to be involved in the pathogenic mechanism of both vitiligo and type 2 DM.<sup>5</sup> These findings suggest that both autoimmune and nonautoimmune components are involved in the pathogenesis of vitiligo. Limitations of the current study included insufficient data for subgroup analyses of different vitiligo variants or ethnicity.