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A Note on Risk Factors of Skin Cancer

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Abstract

Sun exposure and constitutional factors both raise the risk of developing skin cancer. These relationships, nevertheless, are nuanced and vary depending on the type of skin cancer. These findings substantially support earlier research on skin cancer risk factors, but they also show that melanoma is more susceptible to these risk variables than SCC and BCC.

Keywords: Sun exposure; Constitutional factors; Skin cancer; Melanoma

Introduction

There are around 1 million new cases of skin cancer each year in the US, including approximately 55,000 new cases of cutaneous malignant melanoma (hereafter called melanoma). The three main kinds of skin cancer are as follows. The fatalist type is melanoma [1]. Squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) are the two most prevalent non-melanoma skin cancer types (SCC). The aetiology of both melanoma and non-melanoma skin tumours has shown the carcinogenic effects of sunlight exposure. Even though it is believed that certain host factors and sun exposure are linked to the development of skin cancer, the relationships are complicated and can vary depending on the type of skin cancer [2]. Previous analyses of melanoma risk variables have been conducted. The risk factors for melanoma and non-melanoma skin malignancies have rarely been directly examined in studies. While SCC has been linked to cumulative sun exposure, previous epidemiological research has suggested that melanoma and BCC are caused by intermittent sun exposure and childhood solar exposure. Furthermore, it is yet unknown how sun exposure and constitutional vulnerability interact to influence the chance of developing skin cancer. In a nested case-control study within the Nurses' Health Study (NHS) cohort, the aim of the study was to investigate the relationships between constitutional risk factors and sun exposure and their interactions with the risks of the three forms of skin cancer simultaneously.

Discussion

In a nested case-control analysis within the Nurses' Health Study (NHS) cohort, we investigated the relationships between constitutional risk factors and sun exposure and their interactions with the risks of the three forms of skin cancer at the same time [3]. In multivariate models that controlled for other exposure variables, the risks related to the constitutional susceptibility score marginally changed but remained substantial. This shows that each of the three types of skin cancer has a unique risk factor, which is the constitutional susceptibility.

There is evidence that sunburn at any age increases the chance of developing melanoma. The lifetime sunburn variable combines the biological effects of sun exposure with exposure duration. In the age-adjusted models, we found substantial correlations between the frequency of severe sunburns and three different forms of skin cancer [4]. The multivariate models' reduction of the relationships suggested that other factors, particularly the constitutional susceptibility score, contributed to the skin cancer risk associated with severe sunburns. The frequency of lifetime severe sunburns may be a separate risk factor as this association was still present in the multivariate models for melanoma and SCC, even though it had been reduced.

In the past, various studies have linked the use of indoor tanning systems to an increased risk of melanoma. Even though the majority of studies-including our own-performed retrospective assessments, it was recently discovered that reporting the usage of sunlamps following a melanoma diagnosis had a high degree of dependability [5]. According to a prospective study, using a tanning equipment more than once per month between the ages of 10 and 39 significantly increased the risk of developing melanoma, with an OR of 1.55 (95% CI 1.04-2.32). The association between using tanning devices and non-melanoma skin cancer has only been examined in a small number of researches [6]. A connection was seen in one population-based case-control study; the relative risks were 2.5 (95% CI 1.7-3.8) for SCC and 1.5 (95% CI 1.1-2.1) for BCC. In respect to the three forms of skin cancer, we simultaneously assessed sunlamp use or tanning bed use [7]. Comparing melanoma to SCC and BCC, the correlation was strongest and most significant. The majority of earlier studies merely made phenotypic and pigmentation adjustments. In this investigation, the relationships did not significantly alter and were still significant for melanoma risk after correcting for additional factors such as cumulative sun exposure while wearing a bathing suit, lifetime severe sunburns, family history of skin cancer, and geographic location at baseline. According to these findings, additional forms of light exposure were not anticipated to significantly compound the dangers associated with using sunlamps.

Around 1980, a significant decrease in the UVB to UVA ratio of indoor tanning equipment was observed. On the survey, we did not distinguish between age groups or seasons of indoor tanning device use. It's probable that the bulk of the older UVB-emitting devices used in this study were used because the age range of the individuals in our study at baseline (1976) was between 30 and 55 [8]. However, UVA has a cancer-causing effect via oxidising DNA damage through reactive oxygen species produced when light energy is absorbed by cellular chromophores. To assess the impact of more modern UVA-emitting equipment, more research is required. As a measure of recreational and intermittent sun exposure, we employed cumulative sun exposure while

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wearing a swimming suit; this exposure was linked to all three forms of skin cancer in our analysis, with the greatest risk for melanoma [9]. Other factors did not significantly confound the multivariate ORs for cumulative sun exposure while wearing a swimming suit.

Geographical location can be used to estimate the amount of chronic sun exposure. We found that living in the West and South was linked to higher SCC and BCC risks but not melanoma risks, which is in line with descriptive epidemiological data showing a larger North-South gradient for SCC and BCC risks in the US than for melanoma risks.

The constitutional susceptibility score and exposure to sunlight while wearing a swimming suit had a substantial interaction on a multiplicative scale, according to our findings. The greatest risk for melanoma was found in women with the highest scores for constitutional vulnerability and the most sun exposure when donning bathing suits [10]. Among controls, there was evidence of a "phenotype-behavior" feedback, i.e., those controls that were more constitutionally susceptible to sun exposure had less solar exposure while wearing a bathing suit than those who were less susceptible [11]. The combination of skin colour, mole counts, childhood burn propensity, and hair and skin colour was used in this study to determine constitutional vulnerability. People might be made aware of their sensitivity by these recognisable phenotypic features, which would lead to less sun exposure.

Prospective analyses of melanoma risk variables were rarely conducted. Information on sun exposure and skin cancer risk variables for retrospective studies may be prone to recall bias because it was collected after the development of the disease. By comparing odds ratios calculated for these variables with correlations and the difference in mean changes between the responses on the prospective and retrospective questionnaires for the three questions on constitutional factors, we were able to assess the possibility of recall bias [12, 13]. With the exception of childhood and adolescent tendency to burn, which was marginally over-reported among SCC and BCC cases retrospectively, the reliability of each measure was roughly the same magnitude among cases and controls, and the odds ratios based on the prospective and retrospective questions were comparable. These findings showed that, at least for these variables, the retrospective evaluation was not expected to significantly skew the estimate of risk in this study [14, 15]. Weinstock et al. investigated remember bias in 143 instances of melanoma diagnosed between June 1976 and June 1984 in a nested case-control research carried out in 1984 and 1986 within the NHS. The authors found recall bias in the retrospective assessment of capacity to tan, but not in that of hair colour. In this investigation, 200 melanoma cases that submitted blood samples in 1989 and 1990 and received a diagnosis between June 1990 and June 2000 were given retrospective questionnaires, which we gathered in 2002. For the three factors, we did not notice any significant recollection bias among melanoma cases. The disparity in the outcomes could be explained by the two research' differing designs.

Conclusion

In conclusion, the validity of this study is strengthened by the nested case-control design, high follow-up rate, and high response rate for the retrospective extra questionnaire. Self-reported evaluation of pigmentation phenotypes and exposures is one of the study's shortcomings because it could result in classification errors. The results in our cohort of nurses may not be as generalizable as they could be, for example, because outdoor vocations are underrepresented. In multivariate models, we saw that using sunlamps or going to tanning salons continued to be a substantial risk factor for melanoma. An independent risk factor from constitutional susceptibility and other exposure variables was cumulative sun exposure while wearing a bathing suit. We found a significant interaction between constitutional susceptibility and melanoma risk when exposed to the sun while wearing a bathing suit, indicating that the interactions between host factors and sun exposure can be used to help prevent skin cancer.

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