CORRESPONDENCE

Cancers Due to Infection and Selected Environmental Factors

Estimation of the Attributable Cancer Burden in Germany

by Thomas Gredner MPH, PD Dr. med. Gundula Behrens, PD Dr. sc. hum. Christian Stock MSc, Prof. Dr. med. Hermann Brenner, and PD Dr. sc. hum. Ute Mons, in issue 35–36/2018

No Proven Causal Relationship Between Solarium Use and Melanoma Risk

Based on current evidence, we would like to critically discuss the study's finding that an estimated 892 (5%) melanomas are due to solarium (UV tanning bed) use (1), before far-reaching conclusions are drawn. The risk estimators come from an older meta-analysis (2), which shows only associations but not causality (3, 4). Studies on this topic face the challenge of adjusting for solar UV exposure and other confounding factors (2, 3). Subgroup analyses of recent meta-analyses (3, 4) support the hypothesis that solarium users are sun worshippers and increase their risk of melanoma due to solar UV radiation.

A recent meta-analysis (3) reports the following risk estimates for association of melanoma rate with solarium use (odds ratios [95% confidence intervals]):

- worldwide (1.19 [1.04; 1.35])
- Europe (1.10 [0.95; 1.27])
- America (1.32 [1.05; 1.66])
- Australia / Oceania (1.30 [1.00–1.69]).

It is unlikely that the lack of statistical significance in the subgroup “Europe” is due to low statistical power, as the association is significant in the subgroup “America” (which has higher levels of solar UV exposure) despite having a significantly lower number of study participants (Europe: 93 630; America: 10 229; Australia: 1083) (3).

The risk estimates used in Gredner et al. (1) are based on a meta-analysis (2) that takes into account worldwide studies. Regional factors, such as levels of solar UV exposure, the ethnicity of the study population, and the legal regulations for solarium use (concerning age restrictions or technical details of equipment) play a major role and differ significantly in individual countries. Thus, only Germany-wide or Europe-wide studies should be considered for calculating the cancer burden in Germany; however, meta-analyses of these studies (3, 4) show no statistically significant differences in the risk for melanoma following solarium use (for instance, odds ratio 1.10 [0.95, 1.27]) in Burgard et al. [3]).

We therefore consider estimates whether or not (and if so, how many) melanoma cases in Germany can be attributed to the use of solariums scientifically not sufficiently justified.

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References

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Conflict of interest statement

Prof. Reichrath is member of the Arnold Rikli-Award Jury of the Jörg Wolff Foundation. The Saarland University, together with Prof. Reichrath as one of several responsible group leaders, has received a research grant from the Jörg Wolff Foundation. One goal of the Jörg Wolff Foundation is the promotion of research and teaching on the health impact of natural or artificially generated optical radiation on humans. The foundation holds significant shares of JW Holding GmbH, which is an international group of companies that focuses on the manufacture and sale of radiation sources for cosmetic, medical, and technical applications.

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Prof. Pilz states that no conflict of interest exists.

In Reply:

For our analysis on attributable cancer burden (1), we selected risk factors for which there is convincing evidence for a causal relationship with cancer. Ultraviolet (UV) radiation from UV-emitting devices, such as solariums, is considered to be causally related to malignant melanoma (2). Based on this, we calculated the proportions of melanoma due to solarium use.

The risk estimates used to calculate these population-attributable fractions have been taken from a published meta-analysis. In this study, the selection of risk estimates from the individual studies took into account the adjustment of all reported confounding variables (3). This is particularly important as sunbed users tend to be more likely to expose themselves to natural sunlight. As individual studies have also adjusted for exposure to natural UV radiation, it is unlikely that the summary risk estimates for solarium use reflect only higher levels of sunlight exposure among sunbed users (3).

Additionally, the meta-analysis mentioned by Reichrath et al., in which they themselves participated (4), showed a significantly increased risk of melanoma among sunbed users. In extensive subgroup analyses, a higher melanoma risk among sunbed users was consistently found in all subgroups, although not all subgroup results reached statistical significance. Overall, the results of this meta-analysis thus also support such a correlation.

It is vital for us to point out possible conflicts of interest in such studies and correspondences. We see such a potential conflict of interest in the meta-analysis cited by Reichrath et al., which received financial support from the Jörg Wolff Foundation, whose foundation funds come from JW Holding GmbH, which in turn is active in the business area “indoor tanning” and includes suppliers of UV tanning lamps and solariums.

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The authors declare that no conflict of interest exists.