



Indoor tanning and melanoma: are gay and bisexual men more at risk?



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Incidence of malignant melanoma is increasing rapidly worldwide [1]. In USA, there were an estimated 79,100 new cases of melanoma and 9710 melanoma-related deaths in 2014, representing a 2.8 and 2.4% increase in annual incidence compared with 2013 [2]. The underlying cause of this increase is likely related to increasing environmental exposure to ultraviolet (UV) radiation either via direct exposure from sunlight or through artificial exposure from the use of indoor tanning devices such as sunbeds, sunlamps and tanning booths [1]. In 2013, the US Surgeon General identified skin cancer as a major public health problem and recommended increasing prevention efforts aimed at identifying at-risk populations and reducing preventable risk behaviors such as outdoor and indoor tanning [3].

Sexual minority (gay and bisexual) men have recently been shown to have elevated rates of melanoma [4] and indoor tanning [4–6] compared with heterosexual

(straight) men, indicating they may be a high-risk population for skin cancer due to differential risk behaviors. In this editorial, we will review emerging evidence for the relationship between sexual orientation, indoor tanning and melanoma and discuss implications for clinical practice, research and public health.

Indoor tanning, melanoma & sexual orientation

UV radiation from indoor tanning devices is defined by the Department of Health and Human Services as a ‘known human carcinogen’ [7]. Two recent systematic reviews and meta-analyses of large-scale epidemiological data have established a clear connection between indoor tanning and risk of melanoma. Colantonio *et al.* [8] analyzed 31 studies inclusive of over 250,000 participants and found that ever use of indoor tanning devices is associated with subsequent melanoma diagnosis (odds ratio [OR]: 1.15; 95% CI: 1.05–2.58)

KEYWORDS

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and that risk is greatest among individuals who have attended more than ten indoor tanning sessions (OR: 1.34; 95% CI: 1.05–1.71). Boniol *et al.* [9] analyzed 27 studies and found an 1.8% increased risk of melanoma for each additional indoor tanning session per year and that first use of indoor tanning devices before age 35 years was associated with the highest relative risk (RR: 1.59; 95% CI: 1.36–1.85).

Efforts aimed at reducing rates of indoor tanning may thus represent an effective public health strategy to slow the rising incidence of melanoma in the USA [3]. About 30 million Americans, 10% of the national population, use indoor tanning devices each year, with an estimated 1 million indoor tanning sessions each day [10]. The highest utilization has been typically identified among Caucasian women aged 18–21 years (31.8%) and 22–25 years (29.6%) [11]. Accordingly, most research studies and public health interventions aimed at better understanding and reducing indoor tanning behaviors have exclusively targeted young women.

Emerging research has identified that sexual minority men also have high rates of indoor tanning. Blashill *et al.* [6] analyzed a nationally representative, longitudinal study of 1767 males and found a significantly higher prevalence of ever use of indoor tanning devices by age 16 years among sexual minority (22.3%) compared with heterosexual (8.6%) men. Yueng *et al.* [5] analyzed data from the 2013 National Health Interview Survey and found significantly increased rates of both any and frequent indoor tanning (>10-times) in the last 12 months among both gay and bisexual compared with heterosexual adult men. Finally, Mansh *et al.* [4] analyzed population-based epidemiological data from nearly 200,000 adult participants in the state-based California Health Interview Survey and the National Health Interview Survey, and found that 1-year period prevalence of indoor tanning was significantly higher among sexual minority (5.1–7.4%) compared with heterosexual men (1.5–1.6%). This included among participants aged 18–34 years, when indoor tanning use is most associated with increased risk of melanoma [9]. Importantly, indoor tanning rates were as high in young sexual minority men as young heterosexual women, the previously identified highest risk group.

Sexual minority men also report higher rates of melanoma and it is likely that differential

risk behaviors at least partially contribute to this disparity. Mansh *et al.* [4] also found significantly higher age-adjusted prevalence rates of self-reported lifetime history of melanoma among sexual minority (1.1%) compared with heterosexual (0.6%) men. Differences persisted in multivariate logistic regression analysis even after controlling for known risk factors for skin cancer such as age, race, household income, smoking history, alcohol use and healthcare utilization (OR: 1.44; 95% CI: 1.02–2.05). While this is the first study to investigate melanoma prevalence by sexual orientation in the general population, a similar relationship has been observed in one prior study. Lanoy *et al.* analyzed data from 497,142 persons with AIDS and found that an elevated risk of melanoma in this population compared with HIV-negative persons was limited to men who have sex with men. Furthermore, this elevated risk was most strongly associated with increased UV radiation exposure [12]. These findings demonstrate that current research and public health efforts predominantly targeting melanoma risk behaviors in young women may be overlooking sexual minority men, a newly identified, high-risk population for skin cancer.

Implications for clinical practice, research & public health

These studies provide consistent evidence that sexual minority men have an elevated risk of melanoma and higher rates of indoor tanning, a known preventable cause of skin cancer. These novel findings have important implications for clinical practice, research and public health. In clinical practice, these findings highlight the importance of assessing sexual orientation during routine clinic encounters and may necessitate more diligent skin cancer screening and counseling about related risk behaviors for sexual minority men. Knowledge of every patient's sexual orientation is a key element of any patient–provider relationship, but is also critical for accurate risk assessment that informs appropriate counseling and delivery of care. Many physicians do not assess sexual orientation during routine clinical encounters; yet, disclosure is associated with a much higher likelihood of patients receiving appropriate routine screening and preventative health measures [13]. The US Preventative Task Force does not currently recommend routine skin cancer screening in the general population because of insufficient evidence concerning its risks and

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benefits; though, more recent evidence suggests skin cancer screening effectively increases early detection of melanoma and decreases disease-related mortality [14]. Identifying sexual minority men as a high-risk population for melanoma may help physicians risk-stratify those patients among whom more diligent skin cancer screening and counseling about related risk behaviors may be most beneficial.

Further research is needed to better understand the root causes of these disparities in order to design effective solutions. Nearly all studies investigating indoor tanning device use have exclusively concentrated on young women. In this population, indoor tanning has been strongly associated with complex psychosocial factors, including body image, appearance concerns, depression and substance abuse [15,16], but also convenience, mood enhancement and self-perceived health benefits [17]. Compared with heterosexual men, gay and bisexual men are more likely to report body dissatisfaction [18], substance abuse and depression [19], which may predispose sexual minority men to engage in indoor tanning. However, no study has formally investigated correlates or motivations for indoor tanning in sexual minority men. Such information would be critical to inform design of public health interventions that specifically target risk behavior reduction in this group, as there is no evidence that current interventions targeting young women will also be effective for sexual minority men. In addition, prior research has identified that individuals who use indoor tanning devices are also more likely to outdoor

tan [20]. Differences in outdoor tanning behaviors (e.g., sun exposure, protective clothing or sunscreen use) could also mediate the elevated risk of melanoma in gay and bisexual men, yet no study has investigated whether outdoor tanning behaviors also vary by sexual orientation in the general population.

Conclusion

In conclusion, emerging evidence suggests that sexual minority (gay and bisexual) men have an elevated risk of developing melanoma and higher rates of indoor tanning, a known preventable cause of skin cancer. In clinical practice, these findings highlight the importance of assessing sexual orientation during routine clinic encounters, which may help risk stratify patients for appropriate screening and behavioral counseling. Future research should focus on better understanding correlates of melanoma diagnoses and indoor tanning behaviors in sexual minority men to better inform the design of targeted public health interventions to reduce preventable risk factors in these populations.

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