

## On the Relation Between Non-melanoma Skin Cancer and All-cause Mortality Rates

**William B. Grant**

*Sunlight, Nutrition, and Health Research Center (SUNARC), P.O. Box 641603, San Francisco, CA 94164-1603, USA. E-mail: wbgrant@infionline.net*

*Accepted September 10, 2010.*

*Sir,*

The paper by Jensen et al. (1) reported a 9% [95% confidence interval (CI) 7–11%] reduction in mortality rate for patients with basal cell carcinoma (BCC), but a 54% (95% CI, 41–68%) increase for patients with cutaneous squamous cell carcinoma. Smoking is a risk factor for SCC, but not BCC [Ref. 3 in (1)]. Alcohol and tobacco consumption rates are much higher in Denmark than in Sweden. Based on death rates for categories of disease related to alcohol and tobacco, it is estimated that alcohol and smoking account for almost the entire difference between Danish and Swedish men and for 75% of the difference between Danish and Swedish women (2). The role of smoking in the risk of a second cancer after development of non-melanoma skin cancer (NMSC) has been reviewed (3).

Further evidence that long-term higher serum 25-hydroxyvitamin D levels are associated with incidence of BCC is provided by a study of cancer cases listed in the Rhineland-Palatinate cancer registry in Germany (4). Those living in the winegrowing regions had a higher incidence of NMSC and malignant melanoma but significantly lower risk of vitamin D-sensitive cancers, including those of the stomach, colon, rectum, lung and ovary (5). A similar result was found in Spain, where mortality rates for 15 types of cancer were found to be inversely correlated with NMSC mortality rates (6).

While more research is required to more fully understand the findings, they add to the evidence supporting the hypothesis that solar ultraviolet irradiance is more beneficial than harmful. In addition to cancer (5), vitamin D reduces the risk of cardiovascular disease and diabetes (7), as well as infectious diseases (8). It has been estimated that a doubling of solar ultraviolet-B irradiance and serum 25-hydroxyvitamin D concentrations in Denmark would reduce the all-cause mortality by 17% (9).

*Disclosure:* I receive or have received funding from the UV Foundation (McLean, VA), the Sunlight Research Forum (Veldhoven), Bio-Tech-Pharmaceutical (Fayetteville, AR), the Vitamin D Council (San Luis Obispo, CA), and the Danish Sunbed Federation (Middelfart, Denmark).

### REFERENCES

1. Jensen AØ, Lamberg AL, Jacobsen JB, Braae Olesen A, Sørensen HT. Non-melanoma skin cancer and ten-year all-cause mortality: a population-based cohort study. *Acta Derm Venereol* 2010; 90: 362–367.
2. Juel K. [Life expectancy and mortality in Denmark compared to Sweden. What is the effect of smoking and alcohol?] *Ugeskr Laeger* 2008; 170: 2423–2427 (in Danish).
3. Grant WB. A meta-analysis of second cancers after a diagnosis of nonmelanoma skin cancer: additional evidence that solar ultraviolet-B irradiance reduces the risk of internal cancers. *J Steroid Biochem Mol Biol* 2007; 103: 668–674.
4. Seidler A, Hammer GP, Husmann G, König J, Krtuschil A, Schmidtman I, et al. Cancer risk among residents of Rhineland-Palatinate winegrowing communities: a cancer-registry based ecological study. *J Occup Med Toxicol* 2008; 3: 12.
5. Grant WB, Mohr SB. Ecological studies of ultraviolet B, vitamin D and cancer since 2000. *Ann Epidemiol* 2009; 19: 446–454.
6. Grant WB. An ecologic study of cancer mortality rates in Spain with respect to indices of solar UV irradiance and smoking. *Int J Cancer* 2007; 120: 1123–1127.
7. Parker J, Hashmi O, Dutton D, Mavrodaris A, Stranges S, Kandala NB, et al. Levels of vitamin D and cardiometabolic disorders: systematic review and meta-analysis. *Maturitas* 2010; 65: 225–236.
8. Baeke F, Takiishi T, Korf H, Gysemans C, Mathieu C. Vitamin D: modulator of the immune system. *Curr Opin Pharmacol* 2010; 10: 482–496.
9. Grant WB, Juzeniene A, Moan JE. Health benefit of increased serum 25(OH)D levels from oral intake and ultraviolet-B irradiance in the Nordic countries. *Scand J Public Health* 2010 Sep 3. [Epub ahead of print]

*Jensen et al. was given the opportunity to respond but chose not to.*