Skin cancer as a marker of sun exposure

From Richard B Weller

University of Edinburgh, Department of Dermatology, Lauriston Building, Edinburgh, EH3 9HA. E-mail: r.weller@ed.ac.uk, r.weller@ed.ac.uk

The analysis by Brondum-Jacobsen and colleagues1 of skin cancer as a marker for sun exposure and its inverse association with all-cause mortality has been criticized for the immortal person-time bias.2,3 Inappropriately using prospective survival analysis for a retrospective study suggested a dramatic halving of the hazard ratio of all-cause death in individuals with non-melanoma skin cancer (NMSC) compared with the skin cancer-free population. The age- and sex-matched case-control study analysing the same dataset was not subject to this error however, and should not be overlooked. Here, the presence of a NMSC was shown to produce a small but significant reduction in all-cause death (0.97, 0.96-0.99) and a greater reduction in myocardial infarction (0.9, 0.88-0.92). These findings are consistent with the growing body of data suggesting that sunlight exposure, while increasing skin cancer incidence, reduces all-cause mortality. Two recent exemplary prospective Scandinavian cohort studies have both shown that increased sun-seeking behaviour reduces all-cause death.4,5 This effect was dose dependent and occurred after carefully correcting for major confounding factors, and despite the increased incidence of cases (not deaths) of melanoma in more sun-exposed individuals. These studies were designed to quantify the risk of sunlight exposure on the development of melanoma and the resultant deaths from this disease. The separate directions of association between sunlight and melanoma, and sunlight and death, are not what one imagines was anticipated.

The size of the immortal time bias in the NMSC study1 reflects the predominantly non-fatal nature of NMSC. Diseases are generally a function of risk factors and time so, given enough longevity, all those exposed to asbestos would develop mesothelioma and all smokers would develop lung cancer. No immortal person-time bias has ever suggested that asbestos or cigarettes are healthy, because the resultant diseases have a high and rapid mortality.

Current public health policy on sunlight exposure in Europe, North America and Australia inappropriately concentrates on the risk of skin cancer development, and not on all-cause mortality. If reduced sunlight exposure lowered the risk of skin cancer and either reduced or at least had no effect on overall mortality, it would be of benefit. The case-control analysis of Brondum-Jacobsen1 and cohort studies of Lindqvist4 and of Yang5 all suggest that increased sunlight exposure lengthens life. Recent studies suggest mechanisms6-7 independent of vitamin D synthesis, by which sunlight may reduce cardiovascular risk factors.8 The time has come to reconsider our advice on sunlight exposure.

References