Is prevention of cancer by sun exposure more than just the effect of vitamin D? A systematic review of epidemiological studies

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Abstract

The number of studies reporting on the association between sunlight exposure, vitamin D and cancer risk is steadily increasing. We reviewed all published case–control and cohort studies concerning colorectal-, prostate-, breast cancer, non-Hodgkin’s lymphoma (NHL) and both sunlight and vitamin D to update our previous review and to verify if the epidemiological evidence is in line with the hypothesis that the possible preventive effect of sunlight on cancer might be mediated not only by vitamin D but also by other pathways.

We found that almost all epidemiological studies suggest that chronic (not intermittent) sun exposure is associated with a reduced risk of colorectal-, breast-, prostate cancer and NHL. In colorectal- and to a lesser degree in breast cancer vitamin D levels were found to be inversely associated with cancer risk. In prostate cancer and NHL, however, no associations were found. These findings are discussed and it is concluded that the evidence that sunlight is a protective factor for colorectal-, prostate-, breast cancer and non-Hodgkin’s lymphoma is still accumulating. The same conclusion can be drawn concerning high vitamin D levels and the risk of colorectal cancer and possibly breast cancer. Particularly in prostate cancer and NHL other sunlight potentiated and vitamin D independent pathways, such as modulation of the immune system and the circadian rhythm, and the degradation of folic acid might play a role in reduced cancer risk as well.

Keywords: Review, Cancer, Prevention, Sunlight, Vitamin D