

S34. Ultraviolet-B Irradiance, Vitamin D and Human Cancer: A Vision for the Future

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It is just over 25 years since the ultraviolet-B/vitamin D/cancer hypothesis was proposed by Cedric and Frank Garland based on viewing maps of colon cancer mortality rates in the U.S. [1]. Since then, ecologic studies have identified approximately 20 types of cancer as UVB/vitamin D sensitive [2,3]. A recent meta-analysis determined that 1000 I.U. (25 mcg)/day of vitamin D is required for a 50% reduction in colorectal cancer risk. Research interest has turned to investigating the role of vitamin D in increasing the survival of those with cancer. The first work along this line was the observation that 18-month survival of breast, colon, and prostate cancer was 30% greater for Norwegians diagnosed in fall compared to those diagnosed in winter or spring [4]. Recently, a study in Boston found that those operated on for non-small-cell lung cancer in summer and having a high vitamin D index (photoproduction plus oral intake) had a 72% 5-year survival rate compared to a 29% survival rate for those operated on in winter and a low vitamin D index [5]. The EURO CARE-3 database for cancer survival from 1990-94 for European countries is useful in this regard [6]. The 5-year survival rates for a number of UVB/vitamin D-sensitive cancers have intermediate values for Italy and Spain, higher values for Austria, France, and Switzerland, then dropping to the lowest value for Denmark before rising to intermediate values for the rest of the Nordic countries. These variations are consistent with solar UVB being the primary source of vitamin D for people in most European countries, with some solar UVB avoidance in the southern countries, reduced UVB irradiance north of France, and increased oral vitamin D in the other Nordic countries. Further analysis is required to determine to what degree any other factors, such as diet, smoking, or medical care system, affect these variations. The investigations to date are consistent with a strong protective role of UVB irradiance and vitamin D for many cancers. These

findings suggest that increased vitamin D intake and production at the population level through supplements and fortification of foods such as bread [7] and solar UVB irradiance without sunscreen for at least 15 minutes a day, as well as vitamin D doses of at least 2000 I.U. per day for those diagnosed with cancer in addition to other treatments will lead to significantly reduced cancer incidence and mortality rates [8]. Doing so will have many other important health benefits as well [9,10].

References

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