

SUN HEALTH TECHNOLOGIES

CORRELATION BETWEEN UVB, VITAMIN D, AND CANCER

Researchers are finding a strong association between vitamin D levels, UVB exposure, cancer risks and mortality.

Leading medical experts and institutions have acknowledged that maintaining appropriate levels of vitamin D may help prevent and mitigate the risks and symptoms of certain symptoms of immune disorders, neurological conditions including Parkinson's and Alzheimer's diseases, multiple sclerosis, and even cancer. [1]

It has long been known vitamin D is important for bone health, however, for the first time, there is data which shows that improvement in vitamin D levels will significantly affect expression of genes that have a wide variety of biological functions of more than 160 pathways linked to cancer, autoimmune disorders and cardiovascular disease which have been associated with vitamin D deficiency. [2]

UVB EXPOSURE AND VITAMIN D DECREASES RISK AND MORTALITY RATE OF CANCER

Recent research from Harvard Medical School's Dana-Farber Cancer Institute has shown that the risk of cancer can be decreased by exposure to UVB light. [3] Researchers focused on a gene called p53, which has been known to suppress tumors and protect DNA from cancer-causing damage. They found that phototherapy triggers a chain of events that prompts p53 to produce dark pigmentation. This darkened skin, protects the skin from sun damage, which in turn, can reduce one's risk of melanoma. [4]

Vitamin D deficiency affects over one billion world-wide, which is one seventh of the population. [5] Increasing vitamin D levels could prevent substantial loss in life including 250,000 cases of colorectal cancer and 350,000 cases of breast cancer annually, according to researchers at Moore's Cancer Center at the University of California, San Diego. [6] In the U.S. alone, statistics have shown that three out of four Americans are vitamin D Deficient. [7] This condition has also been linked to cancer mortality, and it has been estimated that between 45,000-60,000 Americans die prematurely from cancer due to vitamin D deficiency. [8] According to a study at the Moore's Cancer Center at the University of California, San Diego, increasing vitamin D levels could protect against sixteen types of cancer including breast, colon, endometrial, esophageal, and ovarian cancer, and non-Hodgkin's lymphoma. [9]

Investigations have revealed that every organ and tissue in your body has a receptor for vitamin D. [10] In fact, researchers from the Vitamin D, Skin, and Bone Research Laboratory at Boston University Medical Center discovered that by activating the circulating form of vitamin D, prostate cells are able to regulate their own growth and possibly protect against cancer. [11] Additionally, vitamin D has been found to be a powerful inhibitor of abnormal growth in the colon and breast, and early-stage lung cancer patients with the highest vitamin D levels increased their survival rate by double. [12] Vitamin D has a protective effect against cancer in several ways, including: increasing cancer cell apoptosis, reducing metastasis and proliferation, and reducing angiogenesis. [13]

Most recently, scientists at Harvard, and Oxford, and other universities, have found persuasive evidence that vitamin D reduces mortality. [14] Data from over one million people was analyzed in this meta-analysis and it was determined that low levels of vitamin D increased cancer mortality by 14%, and 13% of all U.S. deaths could be attributed to vitamin D deficiency. [15] Another recent study confirmed these findings and found that decreased vitamin D increased the risk for all-cause mortality. [16]

Vitamin D Phototherapy versus Oral Supplementation

Unlike other vitamins, which may be increased by simple oral supplementation, Vitamin D is a pre-steroidal hormone that is produced predominantly through skin exposure to UVB. Clinical studies have shown that phototherapy is a far superior mechanism for increasing vitamin D as compared to oral supplementation. Studies comparing oral supplementation, sun exposure, and UVB phototherapy for the treatment of vitamin D deficiency have shown that UVB phototherapy is three times more effective than controlled sun exposure [23] and eight times more effective than supplementation. [24]

Congruently, a study soon to be published in The International Journal of Cancer found superior advantages of UVB over supplementation. [26] This study compared the benefits of vitamin D oral supplementation versus UVB phototherapy on intestinal tumors in mice. The results showed that only the UVB treated subjects showed a reduced progression to malignancy. Therefore, the study concluded UVB exposure has an inhibitory effect on outgrowth and malignant progression of primary intestinal tumors, which were effects, not achieved with vitamin D supplementation.

UVB's Protective Effect Against Disease

In fact, new evidence suggests that UVB may provide remarkable health benefits beyond vitamin D production. In addition to UVB's superiority in creating vitamin D, a new hypothesis is being proposed that UVB has astounding benefits beyond vitamin D that play a role in decreasing disease risk.

A review of ecological studies that examine geographical variations in disease outcomes demonstrate a higher incidence of all cause mortality inversely correlated with geographical UVB doses. [42-44] UVB's protective effect against disease has also been reported in both observational studies [45, 46] as well as randomized control trials. [47, 48]

Observational studies have associated vitamin D deficiency with increased prevalence of autoimmune and other diseases. However, randomized controlled trials to treat these disease states with vitamin D supplements have not produced promising results. This has led to a recent line of research that indicates that vitamin D levels may only provide a mechanism of measuring sun exposure. Instead, UVB induced mechanisms rather than vitamin D driven processes may explain many of the benefits often attributed to vitamin D. [49-51]

Clinical evidence has clearly demonstrated the immunoregulatory effects of UVB exposure on the development of allergic asthma in both animal [52] and human models. [53] UVB-induced systemic immunosuppression has been implicated not only to down-regulate immune processes involved in multiple sclerosis, allergic asthma, and type 1 diabetes but also to control inflammatory skin conditions such as psoriasis and atopic dermatitis, as well as reduce responses to vaccines, cancer antigens, and infectious agents [54-56, 60, 61]

In addition to the vitamin D photoreceptors in the skin, there are several photoreceptors that absorb UVB photons, which have been implicated in UVB-induced immunoregulation. These include DNA and lipids of skin cells and trans-urocanic acid located in the stratum corneum. There are several excellent recent reviews of the cellular, biochemical, and immunological changes in the epidermis and dermis upon exposure to UVB and the subsequently increased immune activity in the draining lymph nodes. [57, 58] In addition, UVB has a regulatory effect on T cells. UVB induced T regulatory cells are able to alter antigen presenting cells from stimulatory to regulatory, as well as alter their migration patterns by changed chemokine receptor expression. [59] Thus, UVB has been found to have a protective effect against disease beyond vitamin D expression.

Additional UVB benefits on disease states were explored in a recent study. This study cited many benefits including production of Nitrous Oxide, which is known to reduce blood pressure and improved cardiovascular health. UVB exposure also improves mood through the release of endorphins. The study

concluded that UV radiation may affect many more disease states independent of vitamin D production; therefore, additional studies were needed to further this research. [63]

Safety and Efficacy of Phototherapy

In a study examining the effects of phototherapy, there has been no significant increase in the risk of developing squamous cell carcinoma or basal cell carcinoma associated with long-term exposure to UVB over 25 years. [38] Similarly, a 10 year follow up study of patient exposed to phototherapy showed no significantly increase in the risk of skin cancer. [39]

Conversely, a recent large-scale study following nearly 30,000 women over 20 years, found that women who avoid UVB are at increased risk of skin melanomas and are twice as likely to die from any cause, including cancer. [40]

For further research see our website at www.Sunhealthtech.com

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