Dynamic Chiropractic

VITAMINS / SUPPLEMENTS

Vitamin D Supplementation to Reduce the Risk and Complications of Influenza

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Every year the medical profession and government authorities encourage citizens in many developed countries to get immunized against the current form of influenza virus. In addition to this advice, patients should be aware that supplementation with specific nutrients can boost immune function and may be regarded as an important complementary practice to the prevention of respiratory tract infections.

In this regard, some studies have shown that concurrent supplementation with certain antioxidants can enhance the protective effects of the influenza vaccine. Other studies involving vitamin D have suggested that more optimal vitamin D nutritional status can reduce risk of infection and decrease the likelihood that influenza infections will aggressively invade the lung cavity. Invasion into the lung cavity is what makes influenza viruses life-threatening.

Studies by Bogden, Meydani, Chandra, Blumberg and others have collectively shown that supplementation with vitamin C, vitamin E, beta-carotene, selenium and zinc can boost immune function (even in elderly patients) and, in some studies, have reduced the incidence of respiratory infections. As such, I recommend a high-potency multivitamin/mineral to virtually all adult patients that contains 1,000 mg of vitamin C, 400 IU of vitamin E (succinate), 100 mcg of selenium, 10,000 IU beta-carotene, 15 mg of zinc and a B-50 complex, among the list of all vitamins and minerals from "A to Z." Such a multivitamin/mineral should also include vitamin D, which has received attention in recent studies for its powerful immune modulating influence.

Vitamin D and Immune Function

In recent years, studies have shown that vitamin D is an important modulator of immune function. Some authorities suggest it has the potential to reduce the risk of life-threatening influenzas based on the initial observation that influenza normally strikes in countries during the colder (winter) months when vitamin D production in the skin declines. Reduction in skin production of vitamin D is accompanied by a decline in blood levels of vitamin D levels.

Some vitamin D experts suggest adults should supplement with 2,000 IU vitamin D per day (especially during the winter) as a means to maintain more optimal vitamin D status in general, strengthen immune function and help reduce risk of influenza and its invasion into the lung cavity. Other experts suggest dark-skinned individuals should supplement with 5,000 IU of vitamin D per day during the winter months to help ensure they attain blood vitamin D levels (25-hydroxycholecalciferol) at or above 50 ng/ml.

Most immune cells contain vitamin D receptors, which allow vitamin D to enter the cell and exerts its effects on immune cell behavior. In this capacity, vitamin D has been shown to dramatically stimulate the expression of potent antimicrobial peptides. These peptides exist in neutrophils, monocytes, natural killer cells and in the epithelial cells that line the respiratory tract, where they play a significant role in protecting the lung from infection.

Vitamin D influences both innate and adaptive immunity. The cells of the innate system recognize and respond to pathogens in a generic way, and the adaptive immune cells have the ability to recognize and remember specific pathogens. They, in turn, generate immunity by mounting stronger attacks each time the same pathogen is encountered.

Adaptive immunity involves lymphocytes that are able to express a vast number of specific antigen receptors on their cell surface. Should the pathogen be reintroduced at a later point in time, the antigen receptors are activated and the lymphocytes launch an assault against the pathogen. In adaptive immunity, all of the offspring of the activated cells inherit genes, encoding the same receptor specificity. These cells include the memory B cells and memory T cells that are the keys to long-lived specific immunity.

Vitamin D receptors (VDR) are expressed in monocytes and in activated macrophages, dendritic cells, natural killer cells, and T and B cells. Activation of VDR by vitamin D has been shown to increase the activity of natural killer cells and enhance the phagocytic activity of macrophages. Active vitamin D hormone also increases the production of cathelicidin, an antimicrobial peptide that is produced in macrophages. The release of cathelicidin is triggered by the presence of bacteria, viruses and fungi.

All of these influences enable the immune system to work in a highly efficient manner, reducing risk of infection and reducing severity of infections should they strike. These immune pathways are also important in preventing cancer. In fact, higher blood levels of vitamin D are associated with reduced risk of breast, prostate, colon and other cancers. Several intervention studies have shown that vitamin D supplementation is associated with a reduction in cancer incidence of approximately 50 percent and that supplementation of 2,000 IU per day slows the progression of localized prostate cancer in a high percentage of male subjects.

Vitamin D and Immunity in Human Studies

Human studies indicate that vitamin D deficiency is associated with increased risk of infections, such as influenza and tuberculosis. Volunteers inoculated with live attenuated influenza virus are more likely to develop fever and serological evidence of an immune response in the winter. Vitamin D deficiency has been reported to predispose children to respiratory infections. Ultraviolet radiation (either from artificial sources or from sunlight) has been shown to reduce the incidence of viral respiratory infections. The same holds true for cod liver oil supplementation, which is a rich source of vitamin D. An intervention study also showed that vitamin D reduced the incidence of respiratory infections in children.

The Ideal Vitamin D Strategy to Boost Immunity

Vitamin D has been shown to provide important immune modulation effects that impact both innate and adaptive immunity. In this regard, vitamin D has shown an impressive ability to help the immune system ward off infection from various microbes and to reduce the risk of viruses aggressively invading the lung cavity, where they are most inclined to produce life-threatening consequences. Human observational studies and intervention trials have demonstrated its protective effects against viral infection and certain cancers, and there is emerging evidence that vitamin D supplementation may be an important adjunctive measure in cancer treatment and the treatment of infections.

Some experts suggest supplementing with 2,000 IU of vitamin D per day (especially during the winter months) from a preventive standpoint. Dark-skinned individuals should consider 5,000 IU per day of vitamin D (as melanin pigment in the skin acts as a sunscreen, reducing vitamin D

production in the skin upon exposure to solar radiation). At the first sign of flu-like symptoms, one expert - based on personal experience with herself and family members - suggests supplementing with 2,000 IU of vitamin D per kilogram of body weight for three consecutive days.[1]

I believe it is important for health practitioners to establish a patient's baseline vitamin D blood levels. Evidence strongly suggests that a level above 85 nmol/L is highly protective against osteoporosis, cancer, multiple sclerosis and various infectious processes. Vitamin D toxicity is a concern when blood levels of vitamin D rise above 200 nmol/L. A recent study by Hitz, et al.,[2] indicates that supplementation with 1,400 IU of vitamin D per day appears to be sufficient to raise vitamin D level to the 85 nmol/L level in most patients.

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