Dynamic Chiropractic

HEALTH & WELLNESS / LIFESTYLE

Show Me the Light

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Heliotherapy (sunlight therapy) has a long tradition in Eastern health philosophy. It also has its place in Western healing arts. However, in the past few years helio*phobia* concerning skin cancer and skin aging has been the stronger trend in the West. Indeed, we have become so careful about sun exposure that many experts argue the pendulum has swung too far. Let's examine some of the benefits of light on human health and lifetime wellness so you might better "enlighten" your patients as to the pros and cons of sunlight.

Vitamin D made in the skin by exposure to ultraviolet light is called *cholecalciferol*, commonly known as vitamin D3. Ergocalciferol, otherwise known as vitamin D2, is derived from shining UV light on fungus and is not as active or bioavailable, and can actually be toxic at lower levels.[1] Cholecalciferol is converted by the liver to 25-hydroxycholecalciferol (calcidiol), the form most easily measured in the blood. This compound is then converted by the kidneys to 1,25-dihydroxycholecalciferol (calcitriol), the bioactive form of vitamin D.[2]

Apparently, our bodies were designed to get most of the benefits of vitamin D from sunlight, as there are not a lot of natural sources of vitamin D. Foods high in vitamin D include oily fish, such as salmon sardines and herring. Other such food sources are egg yolks and liver. There are also a variety of fortified foods containing vitamin D, although D2 is often used in such fortification. Although there are many variables to consider, during the wintertime most of us need at least 15 minutes of sun exposure, twice a week, over more than just the hands, neck and face.

Combating Vitamin D Deficiency

The current RDA is 400 IU for adults and 600 IU for those over age 70. The average American consumes about 230 IU/day. Furthermore, vitamin D levels tend be lower with advanced age and in northern latitudes, dark-skinned people, infants and increasingly in adolescents.[3] Sunscreens, when used effectively, inhibit 98 percent of vitamin D production. Anticonvulsants, steroids and cholesterol-lowering medications all interfere with vitamin D metabolism. However, even these RDAs were provided to prevent deficiency states. They are not to be used as markers for optimal wellness and longevity. Fortunately, 20 minutes of whole-body exposure to the sun can produce thousands of IUs of vitamin D.

However, people living north of 40 degrees latitude will often find a twice-weekly practice of whole-body exposure a challenge in the winter. Indeed, a group of physicians estimates 97 percent of the Canadian population is deficient in vitamin D in the winter. The Canadian Pediatric Society is so concerned about the impact of vitamin D deficiency on pregnant and lactating women that it issued guidelines last year increasing its prior recommendation to 2,000 units or more a day.

Therefore, for people with limited sun exposure, especially those with darker skins, supplementation with 2,000 IU or more a day is recommended by some doctors. There is no evidence of harm in doses of up to 10,000 units a day. The safety of 10,000 units/day is based on the average estimate of the units a lifeguard produces via the sun in the summer months. Other

credible sources say that just 20-30 minutes of full-body exposure can produce 3,000 to 20,000 units a day.[4]

Health Benefits of Vitamin D

Cancer, multiple sclerosis, metabolic syndrome, obesity, osteoporosis, flu, fibromyalgia, RA, diabetes, hypertension, hypothyroidism, depression, gum disease, and heart and arterial disease are all related to vitamin D deficiency.[5] Another study reported that when all risk factors are considered, having a low level of vitamin D increases the risk of heart attack just as much as high blood pressure or smoking.[6] Patients with a history of gastric bypass surgery are at a much heightened risk for hypovitaminosis D.[7]

Of greater import to chiropractors, according to the editor of *Pain Treatment Topics,* "Our examination of the research, which included 22 clinical investigations of patients with pain, found that those with chronic back pain almost always had inadequate levels of vitamin D. When sufficient vitamin D supplementation was provided, their pain either vanished or was at least helped to a significant extent."[8] Studies have even shown that a herniated lumbar disc can result from an hereditary defect in the vitamin D receptor gene.[9] Patients with osteopenia and osteoporosis are often vitamin D deficient.[10]

Women with the highest levels of vitamin D showed DNA aging markers called leukocyte telomere lengths (LTLs) that were five years younger than women with low vitamin D levels.[11] Subsets of leukocytes have receptors for the active form of vitamin D that support its direct effect on the immune system.[12-14] This explains, in part, the connections between vitamin D status and autoimmune diseases. Furthermore, an inverse relation has been shown between vitamin D concentrations and C-reactive protein (CRP), a marker of inflammation, in both healthy subjects and patients with rheumatoid arthritis and frailty.[15,16]

Other Benefits of Natural Sunlight

Natural sunlight's benefits are not limited to vitamin D production. As light enters the eyes, photoreceptors convert the light into nerve impulses that travel along the optic nerve to the brain. These impulses trigger the hypothalamus gland to send neurotransmitters to regulate the automatic functions of the body, such as blood pressure, body temperature, respiration, digestion, sexual function, moods, immune and hormonal modulation, and circadian rhythm.

Most artificial (incandescent and standard fluorescent) lighting lacks the complete balanced spectrum of sunlight; a condition known as *mal-illumination*. Windows, windshields, eyeglasses, smog and suntan lotions all filter out parts of the light spectrum and contribute to the problem. Most offices, even those with uncovered windows and the lights on, have a light level of only 500 lux (the international unit of illumination) as compared to outdoor light, which has about 50,000 lux. Light levels for night-shift workers are usually about 50 lux. Our technologies have empowered us to live indoors, illuminating our environment at any hour, day or night, with light. Such lighting, however useful, is often discordant with natural body rhythms and usually without a full-spectrum light at sufficient intensity.

Cognitive decline, mood, behavioral and sleep disturbances, and limitations of activities of daily living commonly burden elderly patients with dementia and their caregivers. Circadian rhythm disturbances have been associated with these symptoms. A study was performed to determine

whether the progression of cognitive and noncognitive symptoms may be ameliorated by individual or combined long-term application of the two major synchronizers of the circadian timing system: bright light (whole-day at 1,000 lux) and melatonin. They concluded that light has a modest benefit in improving some cognitive and noncognitive symptoms of dementia.[17]

New research has uncovered a link between circadian rhythms, sleep patterns, energy expenditure and aging. It is now estimated that 15 percent of our genes are regulated by our circadian clocks.[18] For 11 million Americans, autumn brings a problem set off by a shortage of light. As days shorten, they do not get enough light to end the body's internal night. Come morning, their bodies fail to shut off production of melatonin. The effects of this failure set off a cascade of responses, resulting in a form of depression called seasonal affective disorder (SAD). The best and most specific treatment for SAD has been to garner substantial early-morning exposure to extremely bright, full-spectrum light (30 minutes at 10,000 lux). However, the body's internal clock is most sensitive to short-wavelength blue light. Blue light is actually more effective than other light in halting the body's production of melatonin.[19]

UV and Far-Infrared Rays

UV-B rays from the sun or a UV lamp are the best source of vitamin D. UV rays are also an effective disinfectant for bacteria, viruses and fungi. Indeed, UV is a mainstream treatment for psoriasis, acute tissue rejection and cutaneous T-cell lymphoma. Ultraviolet blood irradiation (UVBI) was developed in the 1920s, although much interest was lost with the development of antibiotics.[20] Today, with the rise of antibiotic-resistant strains, interest in UV is renewing here in the United States. UVBI has also been found to be of value in chronic lung diseases and hypertension. Even simple dermal exposure to UV-B rays has shown promise in allergic asthma.[21]

Like UV light, far-infrared rays (FIRs) are a portion of the natural full-light spectrum that is invisible to the naked eye. Most of the FIRs come from the sun. Although we can't see these rays, when these FIRs penetrate the skin into the deeper tissues, cellular vibration speeds up, creating internal heat. The thermal effects within the deeper layers of tissue cause the blood vessels and capillaries to dilate, promoting increased circulation and removing metabolic waste and toxins through sweating. Water molecules are ionized into hydrogen and hydroxide ions that release gasses and other toxic materials. Cell mitochondria also increase energy production, thereby raising the metabolic rate.

If UV rays need to be avoided, one intriguing detoxification tool is the far-infrared sauna, which interacts with the unique properties of our skin. In a conventional sauna, sweat contains roughly 2 percent toxins and 98 percent water. In FIR saunas, that ratio is said to increase to an amazing 20 percent toxins and 80 percent water. Studies have shown that just 30 minutes in a FIR sauna increases the metabolic rate to such a degree as to burn anywhere from 200 to 600 calories and realize an increase in blood flow from the normal 5-7 quarts a minute to as much as 13 quarts. From a cardiovascular standpoint, it's like exercising without the effort.[22]

An unpublished study from the University of Missouri found that regular FIR sauna use helped in lowering blood pressure. Other studies have found that FIRs inhibit the growth of breast cancer tumors in mice and may prove to be a noninvasive method of treating other cancers.[23] A Japanese study discovered that far-infrared therapy improved lactation in 75 percent of women experiencing difficulty in breast-feeding, enabling half of these women to continue breast-feeding until weaning. Interestingly, the source of the FIRs was a ceramic disc worn on the body.[24] FIRs can also increase

the circulation of blood in bone by as much as 80 percent, which would be beneficial in healing fractures.[25] Furthermore, it improves sleep patterns in both animals and humans, and could be used safely to treat insomnia and other sleep disorders.[26]

The Dark Side

All the above notwithstanding, recommending even small amounts of sun exposure is bad advice, according to the Sun Safety Alliance (SSA), since there is no acceptable dose for carcinogens such as UV radiation. The alliance recommends supplementing over sunning, emphasizing that one in five Americans will develop skin cancer during their lifetime, and that it is one of the few cancers with a known cause.

Each year, approximately 1 million new cases of skin cancer are diagnosed in the U.S., and more than 91,000 Americans are diagnosed with melanoma, the most serious form of skin cancer. One person dies of melanoma every hour. Melanoma is also one of the few cancers that continues to rise at a rate of 3 percent annually. Interestingly, the founding members of the SSA are the National Association of Chain Drug Stores and Coppertone Suncare Products. Considering the continued rise in skin cancer and endemics of suboptimal vitamin D levels, some experts are questioning the efficacy of sunscreens and what they call heliophobia.[27]

Nonetheless, the American Academy of Dermatology recommends that everyone practice a comprehensive sun-protection program, including avoiding outdoor activities when the sun's rays are strongest, seeking shade whenever possible, wearing a broad-spectrum sunscreen with a sun protection factor (SPF) of at least 15 and reapplying every two hours. Sunscreens should protect against both UV-B (the rays that cause melanin production in the epidermis, resulting in tanning) and UV-A (more penetrating and able to pass through glass and light clothing). Overexposure causes aging of the dermis.

As with most health habits, educated moderation is the key. Certainly, various levels of insufficient exposure to full-spectrum natural light is a problem worth consideration in any comprehensive wellness program, and even in some specific therapeutic approaches. In cases in which UV light exposure is to be minimized, supplementation with vitamin D or light treatments limited to certain therapeutic spectrums, like red or blue light, might well be considered.

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