VITAMINS / SUPPLEMENTS

Vitamin D Takes Center Stage

FOR CHRONIC PAIN, INFLAMMATION, IMMUNITY & MORE – THE SPOTLIGHT IS SHINING ON VITAMIN D.

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A multimodal approach to the treatment of chronic pain is the current evidence-based model. Previous articles in my chronic pain series have addressed the importance of flexion-based activities for lumbar stenosis, walking for chronic low back pain and reactive isometrics for the management of chronic whiplash-associated disorders However, while active care is essential to pain management, a true multimodal approach also includes dietary and lifestyle interventions. Vitamin D is a critical supplement in that regard.

Reducing Pain and Inflammation

Chronic pain is defined as pain that has persisted for more than three months. It can be nociceptive, inflammatory or neuropathic in origin. Research indicates vitamin D might influence nociceptive and inflammatory pain mechanisms, but there is very scarce data on the role of vitamin D in neuropathic pain.

Vitamin D is currently classified as a hormone that impacts a wide range of processes including the musculoskeletal and immune systems, and plays an important role in calcium homeostasis. Vitamin D has anti-inflammatory effects in the body by reducing the release of pro-inflammatory cytokines and suppressing T-cell responses. Furthermore, observational and interventional studies suggest vitamin D plays a role in moderating pain intensity and in the management of pain.

Clinical Note: To measure vitamin D levels, evaluate 25-hydroxyvitamin D (25-OHD), which is more stable than the active 1,25 hydroxyvitamin D_3 (25OHD$_3$). Serum levels of 25-OHD below 50 nmol/L are considered insufficient according to the U.S. Institute of Medicine.

Helping Bridge the Gap Between Pain and Immunity

Vitamin D has anti-inflammatory and immune-regulating effects, thus bridging the gap between pain and immunity. It increases anti-inflammatory cytokines, which helps reduce pain; and even reduces intervertebral disc degeneration by inhibiting the NF-kB cytokine pathway.

In clinical studies with chronic pain patients who were vitamin D-deficient and suffering from fibromyalgia or nonspecific musculoskeletal pain, excellent results were demonstrated with vitamin D supplementation. Pain scores decreased and pain tolerance improved after increasing serum vitamin D levels to normal ranges.

Clinical Note: Vitamin D is one part of the multimodal approach to chronic musculoskeletal pain. The research favors maintaining vitamin D levels over 50 nmol/L, creating a significantly greater overall reduction in pain score compared to placebo in patients with chronic pain.

Observational studies have shown that adequate vitamin D levels are needed for muscular function and strength, as well as neuromuscular coordination. Furthermore, low vitamin D levels have been associated with statin-induced myalgia, elevated oxidative stress, muscle atrophy, and reduced mitochondrial function in the multifidus muscle – which incidentally, is a significant co-morbidity in the rehabilitation of chronic low back pain.

Although we have been discussing the treatment of chronic pain, the real role vitamin D provides for our patients is its ability to restore homeostasis when it is deficient in the body. As doctors of chiropractic, we address the underlying cause of our patient's presenting complaint. Measuring vitamin D level is easy and inexpensive; and if supplemented when low, can be a game changer in reducing the inflammatory cascade that impacts pain and innate immunity.

Studies that attempt to correlate chronic pain with vitamin D supplementation lack consistency in several levels, especially in performing a baseline vitamin D level. Perhaps patients who fail to demonstrate a reduction in pain with vitamin D supplementation already had adequate levels. Perhaps the pain was not inflammatory or nociceptive in nature. Perhaps pain scores did not improve, but functional indexes did improve.

These statistical inconsistencies can account for conclusions that vitamin D supplementation is not beneficial for chronic pain treatment via meta-analysis of the research.

Globally, estimates suggest 1 billion people are vitamin D deficient. Furthermore, low levels are not only associated with chronic musculoskeletal pain, muscle weakness, and an increased risk of falling; levels over 40 nmol/L boost immunity and reduce the risk of respiratory tract infections. In addition, observational studies note the association between these higher vitamin D levels with decreased mortality and reduction in chronic diseases.

Clinical Note: Vitamin D supplements can be found as D_2 (ergocalciferol) or D_3 (cholecalciferol). D_3 is considered to be more bioavailable and is the recommended supplement to take.

Defense Against COVID-19?

With the COVID-19 pandemic still in full swing, vitamin D supplementation may be even more significant. Vitamin D is a potent inducer of antimicrobial peptides on mucosal surfaces and in immune cells which constitute the "first line of defense" for invading bacteria and viruses on mucosal surfaces, including the respiratory tract. In fact, vitamin D supplementation has been shown to reduce the number of respiratory tract infections. Since it is only synthesized in the skin in the presence of sunlight, stay-at-home orders may be adding to vitamin deficiencies and a weakened immune response.

Simply put, vitamin D supplementation is a lifestyle recommendation for your patients who are not in the sun, have chronic pain, and desire to boost their immune response.

Clinical Note: The protective effect of vitamin D is most evident in studies using once-daily dosage, whereas bolus doses do not seem to be as effective. Recommendations for supplementation are 4,000-7,000 IU/day for at least three months, or until levels are >50 nmol/L. This dose has been shown to be both effective and safe in clinical studies.

Vitamin D and Chiropractic

As chiropractic is a whole-body approach to restoration and maintenance of health, diet, rest, exercise,

CMT and lifestyle modification are the tools at our disposal. Perhaps ensuring our patients have adequate vitamin D levels, along with the other factors of health mentioned above, we can help our patients reduce their risk for acute and chronic sickness, including seasonal colds, flu and even COVID-19. The multimodal approach to treatment is the strongest weapon we have to strengthen and heal the body.

The bottom line is if a patient is not outside exposed to the sun, eating oily fish or cod liver oil (which are high in vitamin D), taking vitamin D-fortified foods or vitamin D supplements, then determine their 25-OHD level and be sure it is at least 50 nmol/L; especially if they have chronic musculoskeletal pain. The research is clear: Vitamin D levels in the optimum range reduce inflammation, improve the immune response, assist in musculoskeletal health and promote longevity.

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