

FIBROMYALGIA RESEARCH REVIEW

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VITAMIN D DEFICIENCY MAY EXACERBATE CHRONIC PAIN.

Vitamin and mineral deficiencies may perpetuate fibromyalgia syndrome (FMS) and chronic myofascial syndrome symptoms. Vitamin D supports healthy bone renewal, promotes normal cell growth and is a key factor in the maintenance of a healthy immune system. Moreover, low blood levels of Vitamin D are associated with pain and muscle weakness. Indeed new research released by the American Society of Anesthesiologists has shown that as many as a quarter of chronic pain sufferers have inadequate levels of Vitamin D in the blood. Researchers from the Mayo Comprehensive Pain Rehabilitation Center (USA) recorded serum Vitamin D levels in 267 adults undergoing morphine treatment for chronic pain. 26% of patients suffered from a Vitamin D deficiency, which was also associated with lower levels of physical functioning, poor overall health and an increased requirement for morphine (higher dose and duration of treatment).

The current study does not claim that vitamin D deficiency causes fibromyalgia, but rather that it is a perpetuating factor of chronic pain. However other members of the medical profession, including Dr. Michael Holick, an authority on vitamin D, actually believe that a vitamin D deficiency is often misdiagnosed as fibromyalgia. Vitamin D is a fat-soluble vitamin that is synthesised in the body from cholesterol in a reaction requiring ultraviolet light (sunlight). Indeed sunlight usually represents the main source of vitamin D, since modern diets are poor in oily fish that are naturally high in vitamin D. Could FMS be misdiagnosed in patients simply suffering from low vitamin D levels due to lack of sun exposure? The symptoms of vitamin D deficiency and FMS are indeed remarkably similar, as revealed in the table below, raising the possibility that the two conditions may be related.

Vitamin D deficiency symptoms

- Bone pain/fractures
- Muscle pain/weakness
- Low energy/fatigue
- Depression and mood swings
- Sleep disturbances
- Intestinal problems

Fibromyalgia symptoms

- Widespread pain
- Muscle tenderness (11/18 tender points)
- Fatigue
- Depression and anxiety
- Sleep disturbances
- Irritable bowel syndrome (IBS)

Previous studies have found that vitamin D deficiency is associated with anxiety and depression in fibromyalgia, which probably relates to the role of vitamin D in enhancing mood. Recent research has linked vitamin D deficiency with a variety of illnesses including insulin resistance and chronic fatigue, which have also been associated with FMS. While there may be more to

fibromyalgia than just a vitamin D deficiency, further studies will shed light on whether a simple vitamin D supplementation could in fact ameliorate fibromyalgia symptoms.

Vitamin D Inadequacy May Exacerbate Chronic Pain.

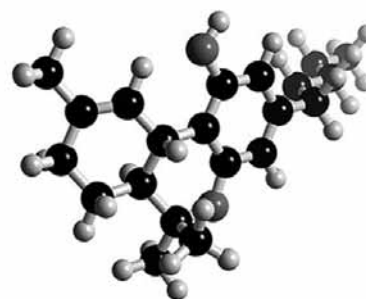
American Society of Anesthesiologists 2007 Annual Meeting in San Francisco.

SYNTHETIC CANNIBOID USED TO TREAT FIBROMYALGIA PAIN.

Cannabis has been used medicinally for thousands of years. Indeed the ancient Indians are thought to have used cannabis as a pain reliever and as a treatment for headaches and insomnia. By the 1800s cannabis was commonly used as a pain reliever throughout most of the world, until the invention of aspirin in 1853. Cannabis was banned in the USA in 1937, and is now an illegal class C drug in the UK. However many chronic pain sufferers, including Vietnam War veterans, claim that cannabis prevents muscle spasms. Scientific studies have also shown cannabinoids to be effective in treating mood disorders such as depression and post traumatic stress disorder. This has led to the development of synthetic cannabinoid drugs, based on the main active ingredient in cannabis (delta-9-tetrahydrocannabinol or THC), which is shown in the diagram below. The synthetic cannabinoid nabilone is licensed for use in the US to treat chemotherapy-related nausea, however it has also been used for chronic pain management. Thus researchers from the University of Manitoba Rehabilitation Hospital (Canada) conducted a study that looked at the effectiveness of nabilone in treating fibromyalgia. In a randomised, double-blind trial, 40 fibromyalgia sufferers were treated with 0.5-1mg nabilone or a placebo drug taken at bedtime for 4 weeks. Since the study was a double-blind trial, the individuals did not know whether they had received nabilone or the placebo. After two or four weeks, patients were assessed for pain, number of tender points, average tender point pain and quality of life.

Skrabek, R.Q., Galimova, L. and Ethansand Daryl, K., 2007. "Nabilone for the Treatment of Pain in Fibromyalgia." J Pain. [Epub ahead of print].

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Nabilone is based on the chemical structure of THC, the most active ingredient in cannabis. This 3D, interactive structure of nabilone can be found at <http://www.3dchem.com/moremolecules.asp?ID=16&othername=Nabilone>

SURGICAL NEUROSTIMULATION TREATMENT FOR FIBROMYALGIA.

It has been hypothesised that fibromyalgia results from abnormal functioning of the central nervous system (brain and spinal cord), and indeed brain imaging has revealed abnormal pain processing in FMS patients. Recent research has shown that electrical stimulation via the surgical placement of electrodes at specific areas of the brain can be used to treat migraine. Investigators from the USA and Belgium modified such surgical neurostimulation techniques in order to determine their effect on pain, fatigue, depression and quality of life in FMS patients. Electrode leads were implanted in the scalp of 12 FMS patients under local anaesthetic. Patients were able to control the frequency of the applied electric current, which was set to a maximum during the day, and either turned down or switched off at night. Six months following implantation, pain, fatigue, depression and quality of life were assessed by a number of questionnaires. Furthermore, pain was also measured by means of pain drawings, which allowed the patients to visually map out their points of pain. Pain drawings were subsequently scored by the number of painful areas. Chronic fatigue, depression and quality of life all improved six months after the implantation. Moreover the number of painful areas drawn by the FMS patients decreased dramatically, showing that this technique reduces overall pain, rather than just localised headache pain. Although an invasive procedure, the benefits experienced by patients warrant further research, in order to validate the effects of this novel technique and to understand exactly how neurostimulation is able to ameliorate FMS symptoms.

Thimineur, M. and De Ridder, D., 2007. "C2 area neurostimulation: a surgical treatment for fibromyalgia." *Pain Med* 8, 639-46.

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RESISTANCE EXERCISE TRAINING IMPROVES HEART RATE VARIABILITY IN WOMEN WITH FIBROMYALGIA.

Although fibromyalgia is currently considered to be a result of abnormal central nervous system functioning, there is increasing evidence to suggest that the autonomic nervous system is also involved. The autonomic nervous system consists of nerves peripheral to the brain and spinal cord, and controls vital functions including heart rate, digestion, perspiration and respiration rate. In accordance with this theory, heart rate variability (a measure of the variation in heart rate) is reduced in FMS patients, which may increase the risk for cardiovascular disease and affect pain perception. Researchers from the US recently published findings in the *Clinical Physiology and Functional Imaging* journal that suggest heart rate variability in FMS patients can in fact be improved by resistance exercise training (RET). Ten FMS patients performed nine exercises consisting of 8-12 repetitions on resistance training machines (chest press, leg extension, leg curl, leg press, arm curl, seated dip, overhead press, seated row and abdominal crunch). The exercise session lasted approximately 30 minutes, and was performed over 16 weeks, with a gradual increase in the weights lifted by 5-10 pounds over the course of the program. The FMS patients were compared before and after the 16 week training program with nine healthy volunteers, who did not complete RET. Before the study, the maximum weight that could be moved

during chest press or leg extension exercises was significantly lower in women with FMS. Furthermore, FMS patients demonstrated reduced cardiac autonomic regulation compared to the healthy controls, which may increase the risk of hypertension. Following the resistance exercise training program, in addition to improved heart rate variability, FMS patients experienced an increase in upper and lower body muscle strength by 63% and 49% respectively. Moreover pain perception decreased by 39% in women with FMS, indicating that a controlled strength training program has the potential to greatly improve cardiac function and autonomic nervous system functioning in women with fibromyalgia.

Figueroa, A., Kingsley, J.D., McMillan, V. and Panton, L.B., 2007. "Resistance exercise training improves heart rate variability in women with fibromyalgia." *Clin Physiol Funct Imaging*.

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FIBROMYALGIA RATED AMONG CHRONIC DISEASES WITH THE GREATEST IMPACT ON HEALTH STATUS.

In spite of the fact that 175 million people in UK have a chronic disease, insufficient progress within the medical health system has been made in preventing and treating chronic conditions, including diabetes, heart disease, arthritis and fibromyalgia. The December edition of the *Journal of Epidemiology and Community Health* reports research conducted by a Canadian group, who investigated the impact of 13 chronic conditions on individual health and in the Canadian population as a whole. A large sample of the Canadian population (130 880 participants) were interviewed and questioned about long-term chronic conditions, activity limitations, self-rated health and number of GP visits in the last 12 months. The four most common conditions were allergies (28.5%), back problems (17.5%), arthritis (15.2%) and high blood pressure (12.6%), with only 1.6% of the participants suffering from fibromyalgia/chronic fatigue syndrome. However in spite of its low frequency among the population, FMS was second only to stroke in the effect on overall health, and was associated with significant activity limitations and poor self-rated health. This study therefore indicates that while FMS has a small impact on the population as a whole due to its relatively low prevalence, it has a great impact on an individual's quality of life.

Perruccio, A.V., Power, J.D. and Badley, E.M., 2007. "The relative impact of 13 chronic conditions across three different outcomes." *J Epidemiol Community Health* 61, 1056-61.

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