

Fibromyalgia: could vitamin D help?

“...the supplementation of vitamin D can be recommended for patients suffering from fibromyalgia not only for its positive effect on pain but also for prevention of severe illnesses associated with vitamin D deficiency.”

Keywords: calcidiol • cholecalciferol • fibromyalgia • vitamin D • widespread pain

Fibromyalgia

Fibromyalgia – a short name for a long list of symptoms – became rather popular among physicians as well as patients around the world especially within the last two decades. Apparently first described in 1816 by William Balfour, lots of patients suffering from chronic widespread pain found their disorders mirrored in the definition of fibromyalgia. Some hypothesize that approximately two percent of the general population suffer from fibromyalgia [1] while others suppose that up to 75% still remain undiagnosed [2].

Many theories about the pathogenesis of fibromyalgia have been established; none of them have proved essential so far. Therefore, many colleagues are quite sceptical about the existence of fibromyalgia as an own entity at all, not least because the symptoms are also quite similar to those of other unspecific syndromes like chronic fatigue or irritable bowel syndrome. Nonetheless most physicians are faced with patients suffering from chronic widespread pain without any clear underlying cause in their everyday practice and it makes sense to both patients and physicians to specify and name a condition providing them the ability to learn from similar cases and obtain a feeling of control over it.

Diagnosing fibromyalgia

The American College of Rheumatology (ACR) criteria of 1990 (based on 18 tender points as well as basic anamnestic criteria) were fulfilled by lots of patients suffering from chronic widespread pain. Many physicians were pleased to have the tender-point concept available as a simple and ‘objec-

tive’ diagnostic tool and hence ran the risk of overlooking other causes or reducing the whole syndrome to a simple problem of decreased pain threshold. This concept was therefore problematic itself, but also because of course not all physicians used an objective measurement tool to apply the predefined pressure of $<4 \text{ kg/cm}^2$ on these tender points – although the examination with the same standardized pressure over all patients is to question as well. Hence, the ACR defined more detailed criteria in 2010/2011 including the presence of symptoms and their severity like fatigue, cognitive symptoms, depression and abdominal cramps [3].

Treatment options

Due to the absence of a satisfying theory about the pathophysiology of fibromyalgia the treatment is rather unspecific like the syndrome itself. While aerobic physical exercise [4] and psychotherapy (like cognitive behavioral therapies [5]) should build the basis of a multimodal approach they are often combined with, for example, functional training or relaxation techniques. Regarding medications patients take classic painkillers like NSAIDs and opioids, but also anticonvulsant drugs, antidepressants, cannabinoids and muscle relaxants. In the past years several studies investigated the effectiveness of 5-HT₃ receptor antagonist tropisetron, opioid antagonist naltrexone and mast cell inhibiting flavonoid quercetin in fibromyalgia. Generally, treatments with possible side effects should only be used temporarily.



Raphael Scheuer
Orthopaedic Hospital Vienna Speising,
Vienna, Austria
raphael.scheuer@oss.at

Vitamin D & fibromyalgia

Most of us know that vitamin D deficiency may cause rickets in children and osteoporosis in grown-ups, nonetheless vitamin D deficiency still seems to be a worldwide issue [6], depending on region and time of year [7]. After discovering that many tissues in human bodies express receptors for vitamin D lots of trials investigated further effects on cardiovascular diseases [8], cancer [9], diabetes mellitus [6], dementia, neuromuscular interaction and the immune system (autoimmune diseases, allergies) [12]. Most of them assume positive effects of vitamin D supplementation to be found in the several entities, but proof is often missing [13].

“To prevent the rare cases of hypervitaminosis, blood examinations (vitamin D, calcium) should be performed periodically if dosage exceeds 2000 IU a day...”

There are also several studies proposing more or less positive effects of vitamin D supplementation on pain relief in patients generally suffering from chronic pain [14] or fibromyalgia [15,16] while others do not support this hypothesis [17]. Generally, fibromyalgia is often reduced to its pain component, hence other symptoms associated are seldom assessed and evidence levels in this regard are rather low [18].

Hence, we started a randomized controlled trial investigating the effects of vitamin D3 (cholecalciferol) supplementation on pain as well as typical disease-associated symptoms in patients suffering from fibromyalgia. The preliminary results have recently been published and show a moderate improvement regarding pain and morning fatigue [19]. The patient sample in this pilot study was too small to draw statistically significant conclusions regarding the effects on further symptoms assessed. To meet the

requirements of the local ethics committee we supplemented a maximum of 2400 IU a day, although the need of raising the intake recommendations is broadly discussed worldwide [20] since the current recommendations date back to 1964 [21] and 1968, respectively, and the toxicity threshold of vitamin D seems to be higher than estimated earlier [22,23].

Conclusion

It is not astonishing that vitamin D is not the panacea for fibromyalgia, a syndrome characterized by symptoms widely affecting body and mind. Nevertheless, probably due to low activity levels of most patients suffering from chronic pain and subsequent reduced exposure to sunlight, many show a vitamin D deficiency, which may deteriorate their complaints and elevate their risk to contract osteomalacia, and perhaps some other illnesses, as mentioned above. Hence, the supplementation of vitamin D can be recommended for patients suffering from fibromyalgia not only for its positive effect on pain but also for prevention of severe illnesses associated with vitamin D deficiency. To prevent the rare cases of hypervitaminosis, blood examinations (vitamin D, calcium) should be performed periodically if dosage exceeds 2000 IU a day [24], which would be reasonable in many patients to my mind.

Financial & competing interests disclosure

The author has no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

No writing assistance was utilized in the production of this manuscript.

References

- Chakrabarty S, Zoorob R. Fibromyalgia. *Am. Fam. Physician* 76(2), 2454 (2007).
- Clauw DJ, Arnold LM, McCarberg BH. The science of fibromyalgia. *Mayo Clin. Proc.* 86(9), 9011 (2011).
- Wolfe F, Häuser W. Fibromyalgia diagnosis and diagnostic criteria. *Ann. Med.* 43(7), 495–502 (2011).
- Busch AJ, Barber KA, Overend TJ, Peloso PM, Schachter CL. Exercise for treating fibromyalgia syndrome. *Cochrane Database Syst. Rev.* 17(4), CD003786 (2007).
- Bernardy K, Klose P, Busch AJ, Choy EH, Häuser W. Cognitive behavioural therapies for fibromyalgia. *Cochrane Database Syst. Rev.* 10(9), CD009796 (2013).
- Lips P. Worldwide status of vitamin D nutrition. *J. Steroid. Biochem. Mol. Biol.* 121(1–2), 2900 (2010).
- Grant WB, Holick MF. Benefits and requirements of Vitamin D for optimal health: a review. *Altern. Med. Rev.* 10(2), 911 (2005).
- Judd SE, Tangpricha V. Vitamin D deficiency and risk for cardiovascular disease. *Am. J. Med. Sci.* 338(1), 44 (2010).
- Park SY, Murphy SP, Wilkens LR, Nomura AM, Henderson BE, Kolonel LN. Calcium and vitamin d intake and risk of colorectal cancer: the multiethnic cohort study. *Am. J. Epidemiol.* 165(7), 7893 (2007).
- Szodoray P, Nakken B, Gaal J *et al.* The complex role of vitamin D in autoimmune diseases. *Scand. J. Immunol.* 68(3), 2669 (2008).
- Ascherio A, Munger KL, Simon KC. Vitamin D and multiple sclerosis. *Lancet Neurol.* 9(6), S599–S612 (2010).
- Amital H, Szekaneecz Z, Szücs G *et al.* Serum concentrations of 25-OH vitamin D in patients with systemic lupus

- erythematosus (SLE) are inversely related to disease activity: is it time to routinely supplement patients with SLE with vitamin D? *Ann. Rheum. Dis.* 69(6), 115157 (2010).
- 13 Ross AC, Manson JE, Abrams SA *et al.* The 2011 report on dietary reference intakes for calcium and vitamin D from the Institute of Medicine: what clinicians need to know. *J. Clin. Endocrinol. Metab.* 96, 58 (2011).
 - 14 Schreuder F, Bernsen RM, van der Wouden JC. Vitamin D supplementation for nonspecific musculoskeletal pain in non-Western immigrants: a randomized controlled trial. *Ann. Fam. Med.* 10(6), 5455 (2012).
 - 15 Abokrysha NT. Vitamin D deficiency in women with fibromyalgia in Saudi Arabia. *Pain Med.* 13(3), 4558 (2012).
 - 16 Matthana MH. The relation between vitamin D deficiency and fibromyalgia syndrome in women. *Saudi Med. J.* 32(9), 9229 (2011).
 - 17 Warner AE, Arnsperger SA. Diffuse musculoskeletal pain is not associated with low vitamin D levels or improved by treatment with vitamin D. *J. Clin. Rheumatol.* 14, 16 (2008).
 - 18 Straube S, Derry S, Moore RA, McQuay HJ. Vitamin D for the treatment of chronic painful conditions in adults. *Cochrane Database Syst. Rev.* 1, CD007771 (2010).
 - 19 Wepner F, Scheuer R, Schuetz-Wieser B *et al.* Effects of vitamin D on patients with fibromyalgia syndrome: a randomized placebo-controlled trial. *Pain* 155(2), 2668 (2014).
 - 20 German Nutrition Society, Bonn, Germany. New reference values for vitamin D. *Ann. Nutr. Metab.* 60, 2446 (2012).
 - 21 Food and Nutrition Board and National Research Council. *Recommended Dietary Allowances (6th Edition)*. National Academy Press, DC, USA (1964).
 - 22 Vieth R, Chan PC, MacFarlane GD. Efficacy and safety of vitamin D(3) intake exceeding the lowest observed adverse effect level. *Am. J. Clin. Nutr.* 73(2), 2894 (2001).
 - 23 Heaney RP, Davies KM, Chen TC, Holick MF, Barger-Lux MJ. Human serum 25-hydroxycholecalciferol response to extended oral dosing with cholecalciferol. *Am. J. Clin. Nutr.* 77, 2010 (2003).
 - 24 Opinion of the Scientific Committee on Food on the tolerable upper intake level of vitamin D. http://ec.europa.eu/food/fs/sc/scf/out157_en.pdf