Vitamin D Deficiency – What Do We Need to Know?
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Article by Marek Doyle, www.blueprintfitness.co.uk

What if I told you that there is a vitamin for which half the population are deficient, and that correcting this deficiency reduces their coronary risk by half? What if I told you that correcting this deficiency would also improve their mood and energy levels/metabolic rate, insulin resistance, and immune system? And that the levels of this vitamin have a stronger correlation to cancer risk than any other?Would you ask me why no-one told you about this earlier?

You'd be right to – the widespread deficiency of vitamin D is one of epic proportions, yet it rarely discussed. If you conduct 20 training sessions per week, then 10 of these are with clients whose hormones, organ systems metabolism are impaired by the lack of such a key nutrient. The most popular aims of my clients are to lose weight and improve their health (in that order); insufficient levels of vitamin D will make weight loss harder and make optimum health impossible. Together with a lack of magnesium, zinc and omega-3s, our food sources and our lifestyles make vitamin D deficiency an epidemic.

There are receptors for vitamin D in 30 different types of tissue, and vitamin D is involved in the transciption of more than 200 different DNA sequences. Put simply, there is very little it is not involved with. Vitamin D is required to manufacture tyrosine hydroxylase, an important enzyme that is required to make dopamine. Without sufficient dopamine, there is insufficient stimuli of the hypothalamus, which can result in mood disorders and a depressed metabolism/hormonal output. It also supports the production of insulin at the pancreas, proving thoroughly beneficial in both type 1 and type 2 diabetes. A study of of more than 10,000 Finnish children given 2,000 IU/day for a year showed a 78% reduction in the incidence of type 1 diabetes in the 31 years of study, and even a lower intake of just 800 IU/day has been shown to reduce the risk of type 2 diabetes by a third. On a day to day basis, vitamin D improves insulin sensitivity. Vitamin D also improves leptin sensitivity (leptin is the hormone that tells us we are full). Reversing insulin and blood sugar swings and reducing over-eating will help weight loss no end.

On a more long-term basis, vitamin D levels are a strong predictor of cardiovascular risk. Data shows that a clear correlation from the incidence of heart attack to the rate of vitamin D deficiency. A 2007 study showed that men with blood levels below 15ng/mL were 2.42 times more likely to suffer a heart attack than those who had levels above 30ng/mL. It also confers powerful protection against cancer; vitamin D increases the self-destruction of mutated cells, reduces the reproduction of cancer cells and interrupts the growth of blood vessels to tumours. Higher blood levels of vitamin D have been shown to be protective against all forms of cancer, reducing risk by between 25% and 50% in a number of studies. That is spectacular. If any of your clients have a family history of cancer and are concerned as to their own risk, advise them to get their vitamin D levels checked.

Another method through which vitamin D improves cancer risk is by enhancing the immune system. It strengthens the innate response, which makes it much more effective against viruses, yeasts/fungi, intracellular bacteria and tumours. The most impressive thing about this enhancement of the immune response is that optimal levels of vitamin D provide protection against colds and infections but also auto-immunity and allergic reactions, especially eczema. With this combined effect, this makes vitamin D one of the best immune modulators known and confers measurable and noticeable benefit when levels of this nutrient are addressed. This is great for your client but also great for you – less sessions cancelled through illness!

A look at how we obtain vitamin D explains the current epidemic of deficiency. Humans make vitamin D3 (cholecalciferol) quite freely when exposed to sunshine.. The other sources are from diet - Cod Liver Oil and, to a lesser extent, fish oils in general. Meanwhile, the RDA has remained at a woefully inadequate figure of 200 IU. And therein lies our problem; as a society, almost none of us get the amount of sunshine we have evolved to receive, and very few get the amount of oily fish they were designed for.

Even when your clients do leave the office for their summer holidays, there is no guarantee this will help the situation. A combination of nanny-state public health warnings and parental paranoia have created a situation where millions refuse to spend more than a few seconds exposed to the sun's rays without slapping on some sunscreen. Burning should always be avoided, but Factor 15 cream blocks around 99% of Vitamin D production at the skin. Recommending short spells of full exposure to the sun is therefore a positive move (clients can always apply the cream afterwards, or cover up/find shade) . It is estimated that the ideal time in the sun (for optimum Vitamin D3 production, anyway) is about a third of the time it takes for the skin to burn – thus, this will change depending on the skin type of the individual and the weather (unsurprisingly, those with darker skin both absorb vitamin D and burn at a slower rate). A lunchtime walk is also strongly advised for all; just half an hour in the sunshine will typically result in the production of 250mcg (10,000 IU) of vitamin D3.

However, these recommendations get more complicated when it comes to the darker months. A 'Vitamin D winter' occurs when there is insufficient sunshine to provide the skin with any UVB rays. This occurs anywhere about 35 degrees latitude and above (this means London, Scandinavia, Chicago, New York, Canada, etc) and will apply for several months per year. I live in the UK and, although this Vitamin D winter will vary from year to year, I would expect it to begin in October and recede during the first shoots of sunshine in March. During this time, clients should be advised to consider either weekly sunbeds or vitamin D3 supplements (which are superior to vitamin D2 – ergocalciferol – as D3 is much more bioavailable).

Weekly sunbeds (at durations less than that used for tanning) are the simplest option in many cases. But, should clients choose to supplement, then the next question is dosage. Whilst an earlier 2004 paper suggested 1,000 IU/day was sufficient to maintain adequate blood levels of vitamin D, five years later there was been a flurry of research (especially in the last two years) which concludes that even these blood levels are actually insufficient. The Vitamin D council provide a blanket recommendation for individuals who suspect deficiency to use a dose of 5,000IU (125mcg) of Vitamin D3 per day, and then take a blood test after 3 months to see whether the dose needs to be altered up or down. The

consensus of research in the last two years is that around 4,000 IU/day is required to maintain optimal bloods levels, in the absence of sunlight. This is a departure from the inclination of mainstream medicine, where a taciturn fear of Vitamin D toxicity still clearly exists. This seems to stem from a 1984 study which found toxicity at only 3,800 IU/day and, although the results have never been repeated in similar studies and recent research has shown that 10,000 IU/day poses no risk risk to adults, the US Food and Nutrition Board set an upper limit at this figure of 3,800 IU/day. The arguments continue to rage. Meanwhile, if your client would prefer to use supplements, then I would suggest referral to a respected nutritional therapist – the job of a good trainer is to recognise deficiencies, not necessarily correct them on the gym floor.

Despite the clear bill of health given to higher doses of oral vitamin D, I still think its always a good idea to check levels in the body when using supplements. This is done through a blood test but, when you do so, be sure to ask the doctor for the right test. Although 1,25-hydroxyvitamin D is the more metabolically active substance in the body, tests for 25-hydroxyvitamin D are a much more reliable test of vitamin D status in the body. Optimal levels appear to be between 45-56ng/mL.

Although vitamin D deficiency is very widespread, there are certain factors that we as trainers can look out for before referring clients to a nutritional therapist:

1. frequent colds and infections
2. eczema, asthma, allergic reactions
3. tooth decay
4. hair loss
5. muscle twitching/spasm
6. arthritis and osteoporosis
7. trouble sleeping
8. anyone who is obese
9. anyone with dark skin
10. anyone with chronic disease (eg high cholesterol, hypertension, etc)

In principle, vitamin D issue is very simple, as per so many other nutrients; when you provide the body with the amount it has evolved with, you see a remarkable improvement in general wellness and all markers for a variety of chronic disease. However, the fact that it can be obtained through sunlight exposure as well as diet makes the discussion on correcting deficiency more complex. Whilst mainstream institutions continue to steer clear of addressing this important issue, that does not mean we as trainers should do the same – if we do, we are doing a disservice to half our client base!

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Marek is a personal trainer, nutritional therapist and allergist operating in Kensington, Chelsea, West London and Basingstoke. He is the director of Blueprint Fitness, www.blueprintfitness.co.uk