



VITAMIN D

What is vitamin D?

Vitamin D is not really a vitamin but a hormone. It is made in the skin as a result of exposure to ultraviolet rays from sunlight and, therefore, referred to as the sunshine vitamin.

What can happen if you have too little vitamin D?

Rickets (softening of bones in children), is the most well-known devastating consequence of a vitamin D deficiency.

An analysis of the NHANES III data (a very large study group) has demonstrated that neither children nor adults in America are receiving an adequate amount of vitamin D from their diet or from supplements. These results have been confirmed in studies done in Australia and New Zealand where it has been shown that 30-50% are deficient in vitamin D.

Vitamin D deficiency causes a defect in the ability of the body to deposit calcium into the collagenous matrix in the bone. Adult patients with osteomalacia (soft bones) often complain of aches in their muscles and bones. This is often confused with fibromyalgia or chronic fatigue syndrome. Correcting the vitamin D deficiency can improve the symptoms dramatically.

More recently, vitamin D deficiency has been associated with increased risk of developing many other chronic diseases related to immune and inflammatory responses including

- cancer,
- cardiovascular disease,
- type 2 diabetes,
- several bacterial and viral infections e.g. Epstein-Barr virus,
- auto-immune diseases such as:
 - type 1 diabetes
 - multiple sclerosis,
 - rheumatoid arthritis,
 - osteoarthritis,
 - systemic lupus erythematosus,
- psoriasis and
- dental / periodontal disease.

How can vitamin D deficiency be related to so many disease types?

Many cells in your body have vitamin D receptors and need vitamin D. Therefore, many biological systems in your body are affected when you have vitamin D deficiency.

We live in 'sunny' South Africa. How can we be at risk for vitamin D deficiency?

- **Exclusively breast-fed infants**

Infants who are exclusively breast-fed and do not receive vitamin D supplementation (400 IU/day) are at high risk of vitamin D deficiency, particularly if they have a dark skin and/or receive little sun exposure.

- **Dark skin**

People with dark-coloured skin synthesize less vitamin D on exposure to sunlight than those with light-coloured skin and, therefore, need 3-4 times more exposure.

- **Aging**

The elderly have reduced capacity to synthesize vitamin D in skin when exposed to UVB radiation, and the elderly are more likely to stay indoors or use sunscreen, which blocks vitamin D synthesis. Institutionalized adults who are not supplemented with vitamin D are at extremely high risk of vitamin D deficiency.

- **Covering all exposed skin or using sunscreen whenever outside**

Osteomalacia has been documented in women who cover all of their skin whenever they are outside for religious or cultural reasons. The application of sunscreen with an SPF factor of 8 reduces production of vitamin D by 95%.

- **Obesity**

Obesity increases the risk of vitamin D deficiency. Once vitamin D is synthesized in the skin or ingested, it is deposited in body fat stores, making it less bioavailable to people with large stores of body fat.

Sources of vitamin D

- **Sunlight**

Ultraviolet rays from sunlight stimulate the production of vitamin D₃ in the epidermis of the skin. Sunlight exposure can provide most people with their entire vitamin D requirement. Children and young adults who spend 5-15 minutes outside in the sun two or three times a week will generally synthesize all the vitamin D they need to prevent deficiency. I don't recommend it, but if you want to tan - do it responsibly.

- **Food sources**

Vitamin D is found naturally in very few foods. Foods containing vitamin D include some fatty fish (mackerel, salmon, sardines), fish liver oils, and eggs from hens that have been fed vitamin D.

Depending on the vitamin A content of cod liver oil, it may not be a good source. High intakes of vitamin A antagonize the action of vitamin D.

•Supplements

Most vitamin D supplements available without a prescription contain cholecalciferol (vitamin D₃). Multivitamin supplements generally provide 400 IU of vitamin D. Single ingredient vitamin D supplements may provide 400 to 2,000 International Units (IU) or even more of vitamin D. A number of calcium supplements may also provide vitamin D.

Are there adverse effects of vitamin supplementation?

Most cases of vitamin D toxicity occurred at serum 25(OH)D levels > 250ng/ml. The primary concern is the risk of hypercalcemia. Any person with a condition that causes high blood calcium levels such as sarcoidosis or primary hyperparathyroidism should not take vitamin D supplements.

How would I know if I am vitamin D deficient?

Serum concentration of 25(OH)D is the best indicator of vitamin D status. So have a blood test done! Ask your doctor or phone or email my rooms for a lab script.

Levels below 30ng/ml indicate a deficiency. The preferred healthy level is at least 30 - 40ng/ml and many researchers suggest an average of 50ng/ml for additional health benefits, but not higher than 100ng/ml.

All the patients in my practice that I have pinpointed to go for a blood test were vitamin D deficient, with the lowest level at 9ng/ml. Re-testing is warranted after 3 months of supplementation.

Any nutrient supplement, however, is effective only if supplemented to a **healthy diet**. Visit my website www.nellysilvis.co.za for more details on healthy eating.

Dr Nelly Silvis Zuid-Afrikaans Hospital Clinic II Room 16 Bourke Street Muckleneuk PRETORIA
012 344 1066
consult@nellysilvis.co.za

References

- Borges MC, Martini LA & Rogero MM. 2011. Current perspectives on vitamin D, immune system, and chronic diseases. *Nutrition*, 27:399-404.
- Grant WB, Cross HS, Gerland CF et al. 2009. Estimated benefit of increased vitamin D status in reducing the economic burden of diseases in western Europe. *Progress in Biophysics and Molecular Biology*, 99:104-133.

- Holick MF. 2009. Vitamin D status: Measurements, Interpretation and Clinical Application. **Annals of Epidemiology**, 19:73-78.
- Souberbielle J-C, Body J-J, Lappe JM, Plebani M, et al. 2010. Vitamin D and musculoskeletal health, cardiovascular disease, autoimmunity and cancer; Recommendations for clinical practice. **Autoimmunity Reviews**, 9:709-715.

