ratmaner/Shutterstock

VITAMIN D DEFICIENCY: A GLOBAL HEALTH PROBLEM

Dr. Johanna Ward explains why getting enough of the 'sunshine vitamin' is vital to body and skin health; but not always possible.

Vitamin D deficiency currently affects in excess of 1 billion people globally, and as such is classified as a global public health problem.

Most of our recent understanding of Vitamin D has come from the last 15 years where we have discovered that Vitamin D is important, not just for bone strength, but for cancer prevention, immunity, cardiovascular protection, brain health, skin health, muscle health and disease prevention.

Vitamin D is known as the *Sunshine Vitamin*.

We need to make it every day and we do this with the help of sunshine. But in many parts of the world such as the UK, Northern Europe, North America & Canada there isn't enough sunshine at the right UV index to allow this to occur, leaving many people deficient.

Given the lack of available sunshine in the UK, Public Health England in 2016 advised that all Britons take a minimum of 10 micrograms (400IU) Vitamin D3 in supplement form to prevent against rickets, osteomalacia, bone pain, muscle aches, and all the other health conditions related to Vitamin D deficiency.

How can you get Vitamin D?

Most people get about 90% of their Vitamin D from sunshine, and approximately 10% from their diet. Sunlight exposure is the primary source of Vitamin D for most people. Solar UVB radiation (290-315nm) stimulates the production of Vitamin D3 from 7-dehydrocholesterol (7-DHC) in the keratinocytes of the stratum basale and the stratum spinosum of the skin. It enters the circulation and is then transported to the liver, and afterwards the kidneys, where it is transformed into 1,25-dihydroxyvitamin D3. This is the most bioactive and potent form of Vitamin D.

We can make Vitamin D through regular sun exposure, but the problem is that people living at certain latitudes cannot synthesise enough during the Winter months. The other problem is that many people nowadays work long hours in offices where exposure to natural light is scarce. Numerous factors affect the ability to produce Vitamin D, including latitude, season, time of day, UV Index, age, skin colour, sunscreen use and BMI.

In the UK, in the months from September to May, the sun is too low in the sky for us to make Vitamin D through UVB exposure. If you cannot make enough Vitamin D from sunshine, then some foods are an alternative source. These include oily fish like salmon, mackerel, herrings and sardines, plus some red meats and eggs. The problem is many of us don't eat enough of these foods, like salmon and eggs every day, to make adequate Vitamin D from our diets.

At risk groups

- Anyone over 55 (who are less efficient at making it)
- Anyone with darker skin e.g., Asian, Mediterranean, Afro-Caribbean
- Anyone who covers up in the sun, or who wears sunscreen
- Teenagers who don't get outside much
- Those on restricted diets/post weight-loss surgery
- House bound people
- Infants and children
- Anyone who is overweight

Darker skin types

Melanin competes with 7-DHC for the absorption of UV light and hence acts as a natural sunscreen, further reducing the effectiveness of epidermal Vitamin D production. Melanin can effectively reduce the skin's ability to manufacture Vitamin D by 93-95%, meaning that darker skin types need approximately 3-5 times more sun exposure than fairer skin types to make the same amount of Vitamin D.[1] This is true of Vitamin D3 supplements as well.

Anyone who doesn't go out much e.g., office workers, teenagers, house bound individuals

Your body can't make Vitamin D when you are sitting indoors, even if you sit in the sunlight, because UVB doesn't pass through glass like other portions of the ultraviolet radiation, and it's UVB that helps our bodies make Vitamin D.

Another problem for house bound individuals is that Vitamin D is only stored in the body for 1-2 months so by mid-Winter stores have often been depleted. A 2000IU Vitamin D3 supplement is ideal for house bound individuals.

Aged over 55

Ageing reduces the body's capacity to manufacture Vitamin D, with the over 60s being thought to have about 50% lower Vitamin D manufacturing capability.[2]

Sunscreen

Studies have found that the application of a sunscreen with an SPF value of 8 reduces the body's production of Vitamin D by almost 95%.[3]

Overweight

One study tested the blood levels of Vitamin D after sun exposure in both obese and non-obese subjects. Both saw an initial rise in Vitamin D levels after similar exposures, but 24 hours later, there was 57% less Vitamin D in the blood of the obese subjects. Both groups had a similar capacity of the skin to produce the vitamin.

The difference was thought to be in the release of Vitamin D, from the skin into the circulation. It is believed that the fat under the skin in obese individuals can hold onto the (fat-soluble) vitamin instead of releasing it.

Infants and children

These are a high-risk group and all under 5s in the UK should be on supplemental Vitamin D3, which is provided free of charge on the NHS.

In the last five years, the number of children with Vitamin D deficiency has increased by more than 200%, according to a study commissioned by the UK-based public awareness campaign *Vitamin D Mission*.[4] This is to do with many factors, but fussy eating, poor parental knowledge and poor information from the HealthCare sector about the importance of Vitamin D are the most likely causes.

Pregnancy

Vitamin D optimisation is hugely important in pregnancy. Studies have now shown that maternal Vitamin D deficiency is linked to increased incidence of infantile asthma and eczema, plus increased risk of children developing Type 1 diabetes, Multiple Sclerosis, Rheumatoid Arthritis and Crohn's disease in later life.

Practical tips for getting natural Vitamin D

Experts agree that the best way to get Vitamin D is through natural sun exposure. The important thing is to never burn the skin in pursuit of native Vitamin D production. But for many people, due to the latitude at which they live, it means all year round sun exposure isn't possible.

For natural Vitamin D production you should allow sunshine onto your lower arms or legs, (without sunscreen), from late March to late September, between the hours of 11-3pm. After 15 minutes, (or as the skin starts to change colour), apply sunscreen to protect the skin.

If you have darker skin, (with more abundant melanin), you will need to spend longer in the sun, unprotected, to make the same amount of Vitamin D as someone with lighter skin. This is likely to be 3-5 times the amount of sun exposure that a lighter skin type will need.

Supplements

If you can't get enough Vitamin D through sun exposure, or your diet, then supplements are essential. Supplements should be taken in the Vitamin D3 (cholecalciferol) form as it's more effective and bioavailable than the D2 (ergocalciferol) form, and is more constant in the blood.

Studies have consistently shown that Vitamin D3 is more effective than D2. A 2012 meta-analysis comparing supplementation of D3 versus D2 and their effect on serum 25 OH measurements showed D3 to be significantly superior in raising serum 25 OH levels.[5]

Another review of over 50 Vitamin D studies also showed that Vitamin D3 offers a noticeable decrease in overall mortality, performing significantly better than D2 in reducing death rates from all causes.[6]

Ekaterina Markelova/y uduhunt/Shutterstock

ZENii
LONDON

Healthy skin starts within...

Selling SPF? Are you advising on the need for **Vitamin D?**

As part of the ZENii Skincare range, we now offer 'Sunshine Bottled'. This gives a high strength dose Vitamin D3 in a once a day, easy to take supplement.

ZENii Sunshine Bottled is the most bioactive and bioavailable form of Vitamin D and is superior to Vitamin D2 as a health supplement. Vitamin D3 is also the same form that your body makes when it is exposed to UVB ray's in the sunshine, and so replaces a lack of sunshine perfectly.

The Health benefits include:

- Contributes to bone & muscle health
- Contributes to cardioprotection
- Helps to improve immunity
- Helps to prevent against cancer

With an attractive trade price **of £10pm for 2 months' supply**, ZENii Vitamin D is the perfect complement to your clients' existing SPF products.

For more information about Sunshine Bottled and other products in ZENii Supplements, including Probiotics, ProCollagen, Omegas and more, contact us today!

Vitamin D deficiency is a global health problem with significant and profound impact on an individual's health and wellness.

It is well evidenced that optimisation of Vitamin D levels should form part of all community preventative health programs. Vitamin D deficiency is easily correctable with oral Vitamin D3 supplementation and has little to no side effects or risks. Public Health England advises that all Britons consider taking a Vit D supplement during Autumn and Winter.

EXCLUSIVE MAGAZINE OFFER

10 FOR THE PRICE OF 8

Purchase 8 Sunshine Bottled at £80 + VAT and receive 2 bottles **FREE**.

Offer valid until 28.02.18

Why ZENii?

ZENii was created and formulated by multi award-winning Dr. Johanna Ward, one of the UK's leading skin doctors. Lead by her, our team of doctors, cosmetic scientists and nutritionists have created a cutting-edge skincare and supplements range.

Each product has been meticulously formulated to deliver the very best in clinically proven ingredients and micronutrients to optimise skin health. We believe in nourishing the skin from without and within. This is the future of anti-ageing, wellness and living a long and healthy life.

FOR MORE INFORMATION ABOUT THE ZENii RANGE, CONTACT US TODAY

01788 577 254 | zenii@consultingroom.co.uk | www.ZENii.co.uk

In addition, Vitamin D3 supplementation has also been shown to maintain serum Vitamin D levels better, which is especially of benefit in the long, cold winter months.

Importance of Vitamin D

The Vitamin D endocrine system plays a primary role in the maintenance of normocalcaemia. The association between Vitamin D deficiency and bone disease, such as rickets, osteomalacia and osteoporosis are well recognised and documented, but in the last 15 years we have increasingly seen a link between Vitamin D deficiency and many other aspects of health. Indeed it is now well evidenced that Vitamin D helps maintain proper immune function, muscle health, protects against cancer (especially breast, prostate and colon), reduces the risk of cognitive decline, arthritis, MS and low mood. All of the actions are due to Vitamin D's Prohormone status and the fact that almost all cells in the human body have Vitamin D receptors, known as VDRs.

Fatigue, low mood & Vitamin D

Vitamin D deficiency is related to fatigue, muscle atrophy and low mood. Controlled studies have shown that giving Vitamin D supplements can help combat low mood and seasonal depression that can occur in the winter months.[7] In addition case studies and large observational studies have shown a link between Vitamin D deficiency and fatigue. In fact levels below 20ng/mL were linked to fatigue and tiredness.[8]

Crohn's & Vitamin D

Crohn's disease: A recent analysis of 63 studies on Crohn's disease found that there was a 57.7% prevalence of Vitamin D deficiency in CD patients. They also found that the more severe the CD was, the lower the circulating Vitamin D levels were.

Fibromyalgia & Vitamin D

The exact relationship between low Vitamin D levels and fibromyalgia (FM) is unknown at this time, but there is an increased deficiency risk in people with FM. In a study of 150 patients with FM, 93% had deficient levels of Vitamin D. In another study of 103 patients with FM or muscle pain, 75% had low Vitamin D levels. Treating the deficiency resulted in 90% of them having improvements in their symptoms.

Anti-ageing & Vitamin D

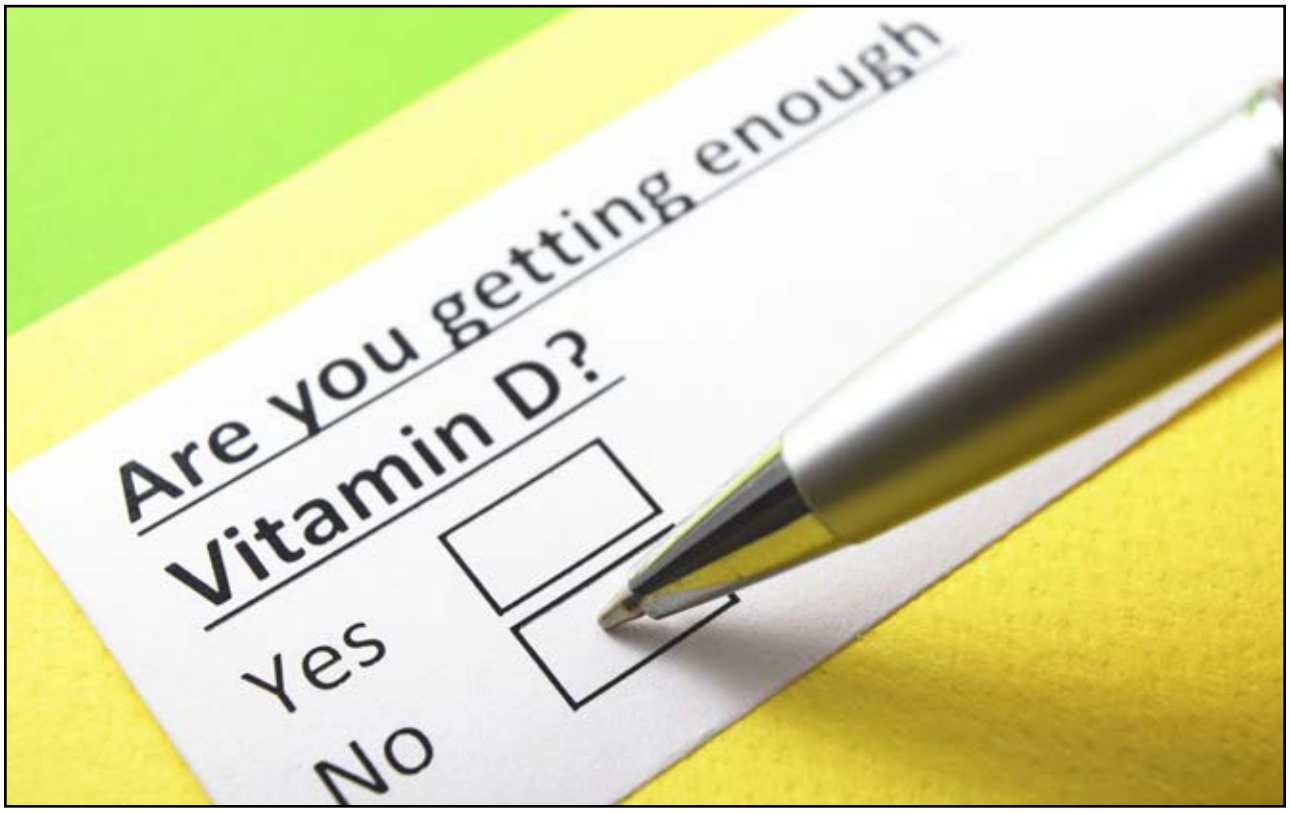
Kings College Hospital in 2007 studied 2160 women between the age of 18-79 and showed that higher levels of Vitamin D reduced age related changes in the skin as assessed by telomere length. Telomeres are a biological marker of ageing. The study is exciting because it suggests that Vitamin D slows down the process of DNA ageing, through anti-inflammatory action on the skin.[9] More studies need to be conducted on the potential link between anti-ageing and Vitamin D.

Skin Health & Vitamin D

Studies conducted in Australia in 2012 showed that pregnant mothers with Vitamin D deficiency had more chance of having a baby with infantile eczema in the first year of life and that every 4ng/mL increase in Vitamin D was linked to a 13% lower chance of a baby having eczema.[10] Another study done in 2012 looking at the link between Vitamin D and eczema gave people over age 14 with eczema either 1600 IU of Vitamin D or a placebo daily for 60 days. The researchers then compared eczema severity and symptoms between the 2 groups and found that the Vitamin D group showed more improvements in eczema symptoms than the placebo group and that the severity of eczema was much lower after people took Vitamin D supplements.[11]

Multiple Sclerosis & Vitamin D

MS is a chronic inflammatory demyelinating disorder of the neurological system that is determined by genetic and environmental factors. It has been long suspected that Vitamin D deficiency is related to MS because MS is found much more commonly in climates with higher latitude where



Yeexin Richelle/Shutterstock

access to higher intensity UVB is limited. Several studies have shown that optimisation of Vitamin D levels is associated with decreased risk of MS, especially if the sun exposure occurred during childhood and adolescence.[12,13] Studies have also shown that an infant's birth month is correlated with their MS risk - so individuals born in the Autumn months (mothers were exposed to summer sunlight during pregnancy) have a low MS risk whilst infants born in the spring have higher MS risk.[14] Persons who are at risk for MS (e.g., anyone with a first-degree relative with MS or patients with a single episode demyelinating attack) should be screened for Vitamin D deficiency and treated appropriately. Patients with established MS should keep their Vitamin D levels optimised as optimised levels are related to minimisation of disability. Experts suggest that maintaining 25(OH)D levels between 75 to 125 nmol/L in MS patients is ideal. The established link between Vitamin D and MS has huge importance. The mechanism of protective action of Vitamin D and MS risk is thought to be due to the immune modulating activity. of Vitamin D.

Cancer prevention & Vitamin D

Many epidemiological studies have shown that Vitamin D optimisation protects against colon, breast and prostate cancer. A PubMed database search yielded 63 observational studies of Vitamin D status in relation to cancer risk, (30 for colon, 13 for breast, 26 for prostate, and 7 for ovarian cancer), which found a protective relationship between sufficient Vitamin D status and lower risk of cancer. The evidence suggests that optimisation of Vitamin D levels through use of supplementation could reduce cancer incidence and mortality with few or no adverse effects. These kinds of studies create impetus for ensuring adequate Vitamin D intake in order to reduce the risk of cancer.[15]

Symptoms of Vitamin D deficiency

Sometimes people with Vitamin D deficiency are totally asymptomatic which makes diagnosis harder. Generalised symptoms include:

- Bone pain
- Muscle aches/atrophy
- Depression/low mood
- Weakness/fatigue
- Poor wound healing
- Reduced immunity
- Falls
- Cognitive decline

How to get tested?

A quick and simple blood test (for 25-hydroxy vitamin D) by your GP can diagnose Vitamin D deficiency.

Summary

Vitamin D deficiency is a global health problem with significant and profound impact on an individual's health and wellness. It is well evidenced that optimisation of Vitamin D levels should form part of all community preventative health programs. Vitamin D deficiency is easily correctable with oral Vitamin D3 supplementation and has little to no side effects or risks. Since 2016, Public Health England has advised that all Britons take an oral Vitamin D3 supplement.

References

1. Holick MF, Maclaughclin JA "Regulation of Cutaneous previtamin D3 photosynthesis in man:skin pigment is not an essential regulator' Science 1981:211 (4482) 590-593 PubMed
2. Holcikk MF & MacLaughlin 'Aging decreases the capacity of human skin to produce vitamin D3' J Clinic Invest. 1985:76 (4): 1536-1538 PubMed
3. Matsuoka LY, Wortsman J 'Sunscreens suppress cutaneous Vitamin D3 synthesis' J Clin Endocrinol Metab 1987:64(6); 1165-1168 PubMed
4. Mail Online October 20, 2014
5. Laure Tipkovic et al 'Comaprison of Vitamin D2 and D3 supplementation in raising serum 25OH D status. Am J Clin Nutrition 2012 June 95(96)1357–1364.
6. Bjelakovic G1, Gluud LL, Nikolova D, Whitfield K, Wetterslev J, Simonetti RG, et al. Vitamin D supplementation for prevention of mortality in adults. Cochrane Database Syst Rev. 2011 Jul 6(7):CD007470. doi: 10.1002/14651858.CD007470.pub2.
7. Jorde R et al 'Effects of vitamin D supplementation on symptoms of depression in overweight and obese subjects: randomized double blind trial.J Intern MedicineDec 2008 264 (6) 599-609
8. Ecemis GC, 'Quality of life is impaired not only in vitamin D deficient but also in vitamin D-insufficient pre-menopausal women." J Enocrine Invest 2013 September 36 (8) 622-627
9. November 2007 The American Journal of Clinical Nutrition
10. Akan A, Azkur D, Ginis T, Toyran M, Kocabas CN. Vitamin D Level in Children Is Correlated with Severity of Atopic Dermatitis but Only in Patients with Allergic Sensitizations. Pediatr Dermatol. 2013;30(3):359–364. doi:10.1111/pde.12058
11. Amestejani M, Salehi BS, Vasigh M, Sobhkhiz A, Karami M, Alinia H. Vitamin D supplementation in the treatment of atopic dermatitis: a clinical trial study. J drugs dermatology. 2012;11(3):327–330.
12. Islam T, Gauderman WJ, Cozen W, Mack TM. 'Childhood sun exposure influences risk of multiple sclerosis in monozygotic twins'. Neurology. 2007;69:381–388.
13. 5. van der Mei IA, Ponsonby AL, Dwyer T, Blizzard L, Simmons R, Taylor BV, et al. Past exposure to sun, skin phenotype, and risk of multiple sclerosis: case-control study. BMJ. 2003;327:316.
14. Dobson R, Giovannoni G, Ramagopalan S. The month of birth effect in multiple sclerosis: systematic review, meta-analysis and effect of latitude. J Neurol Neurosurg Psychiatry. 2013;84:427–432.
15. Cedric F Garland et al 'The role of Vitamin D in cancer prevention' Am Journal Pub Health:2006 February; 96(2): 252–261

To download a CPD Reflective Learning Form, produced in association with the British Association of Cosmetic Nurses (BACN), please use the QR code or visit bit.ly/CR-CPD in your web browser.