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Management of vitamin D deficiency

An excellent review published in 2010 in the BMJ gives a current overview of the diagnosis and management of vitamin D deficiency in the UKⁱ.

Note: Where “calciferol” is mentioned the recommended form of Vitamin D is CHOLECALCIFEROL.

Overview in the UK:

“Rickets in children and osteomalacia in adults are the classic manifestations of profound vitamin D deficiency. In recent years, however, non-musculoskeletal conditions including cancer, metabolic syndrome, infectious and autoimmune disorders have also been found to be associated with low vitamin D levels. The spectrum of these common disorders is of particular concern because observational studies have demonstrated that vitamin D insufficiency is widespread in many northern regions of the world, including industrialised countries. The increasing prevalence of disorders linked to vitamin D deficiency is reflected in the several hundred children with rickets treated each year in the UK. However, these children represent a small proportion of the individuals with a suboptimal vitamin D status in the UK population. A recent nationwide survey in the United Kingdom showed that more than 50% of the adult population have insufficient levels of vitamin D and that 16% have severe deficiency during winter and spring.”ⁱ

Typical levels in the UK:

“Vitamin D status is most reliably determined by assay of serum 25-hydroxyvitamin D (25-OHD). Individuals with symptomatic osteomalacia or rickets have serum 25-OHD concentrations of

less than 25 nmol/l (10 mcg/l), reflecting profound vitamin D deficiency. A much larger proportion of the UK population (about 50% in spring) have vitamin D insufficiency, with serum 25-OHD concentrations between 25 nmol/l and 50 nmol/l (10-20 mcg/l).”ⁱ

Treatment recommendations in the UK:ⁱ

Box 4 | Treatment of vitamin D deficiency and insufficiency

Deficiency (25-OHD <25 nmol/l)

Adult

- 10 000 IU calciferol daily or 60 000 IU calciferol weekly for 8-12 weeks*
or
- Calciferol 300 000 or 600 000 IU orally or by intramuscular injection once or twice

Child

- Under 6 months: 3000 IU calciferol daily for 8-12 weeks
- Over 6 months: 6000 IU calciferol daily for 8-12 weeks or
- Over 1 year: 300 000 IU calciferol, as a one off high dose therapy (Stoss regimen)†

Insufficiency (25-OHD 25-50 nmol/l) or maintenance therapy following deficiency

Adult

- 1000-2000 IU calciferol daily
or
- 10 000 IU calciferol weekly

Child

- Under 6 months: 200-400 IU calciferol daily‡
- Over 6 months: 400-800 IU calciferol daily

*To convert IU to µg of calciferol, divide by 40.

†One off high dose treatments are effective, but should be followed by a maintenance therapy dose of calciferol.

‡200 IU may be inadequate for breastfed babies with low vitamin D stores at birth.



Is this relevant to Australia?

The short answer is yes. **Any person who tests with the 25-OHD blood levels listed above should be treated as described above.**

There is significant debate about the extent of vitamin D deficiency in Australia and what levels of sun exposure produce what vitamin D effect. In Australia the numbers of people presenting with frank vitamin D deficiency/insufficiency are likely lower than the numbers seen in the UK. A position statement about vitamin D deficiency/insufficiency and treatment was published in 2005 in the MJA ⁱⁱ.

Major groups identified at risk of vitamin D deficiency include "...elderly people (particularly those in residential care), people with skin conditions where avoidance of sunlight is advised, those with dark skin (particularly if veiled), and those with malabsorption." ⁱⁱ

"A significant number of Australians are deficient in vitamin D — it is a fallacy that Australians receive adequate vitamin D from casual exposure to sunlight." ⁱⁱ

The position statement has received some criticism about levels of vitamin D vs. sun exposure and there are arguments that the figures quoted are not particularly applicable in Australia ⁱⁱⁱ.

However, despite this criticism, it is well known that vitamin D deficiency is common and several groups are significantly at risk ^{iv}.

"We stand by our original claim (in the position statement) that a number of groups in the Australian community have a high prevalence of vitamin D deficiency, including elderly men with hip fracture (63%), Muslim women (68%), elderly ambulant men with prostate cancer (34%), "healthy" elderly men living in Southern Sydney (16%), healthy community-dwelling, ambulatory women in Geelong (20% in the age group 20–39 years, increasing to 53% in older age groups), men and women (some with psychiatric disorders) in south-east Queensland (23%), and even pregnant women in south-eastern Australia (7%)." ^{iv}

Also, "...We agree ... that any individual who has limited mobility, or is housebound or institutionalised, is at risk of vitamin D deficiency." ^{iv}

What to do:

In the end, Australians are going to respond to vitamin D supplementation in much the same manner as people in the UK. If a person is deficient, they are deficient – end of story. Treatment is the same. People whose measured 25-OHD levels are within the bounds of deficient/insufficient can be treated according to the recommendations in "Box 4 | Treatment of Vitamin D Deficiency and Insufficiency" ⁱ.

ⁱ Pearce SH, Cheetham TD. Diagnosis and management of vitamin D deficiency. *BMJ*. 2010 Jan 11;340:b5664. doi: 10.1136/bmj.b5664. Review. PubMed PMID: 20064851

ⁱⁱ Working Group of the Australian and New Zealand Bone and Mineral Society; Endocrine Society of Australia; Osteoporosis Australia. Vitamin D and adult bone health in Australia and New Zealand: a position statement. *Med J Aust*. 2005 Mar 21;182(6):281-5. PMID: 15777143

ⁱⁱⁱ Chia AL, Shumack S, Foley P. Vitamin D and adult bone health in Australia and New Zealand: a position statement. *Med J Aust*. 2005 Jul 4;183(1):52-3; author reply 53-4. PubMed PMID: 16180268

^{iv} Terrence H Diamond, John A Eisman, Rebecca S Mason, Caryl A Nowson, Julie A Pasco, Philip N Sambrook, John D Wark. Vitamin D and adult bone health in Australia and New Zealand: a position statement. *Med J Aust*. 2005 Jul 4;183(1):52-3; author reply 53-4.