

Vitamin D Deficiency in Refugees

What is the issue?

An increasing prevalence of Vitamin D deficiency has been noted amongst immigrant groups living in Australia. Vitamin D deficiency can result in rickets in children and in osteomalacia and/or osteoporosis in adults. Those most at risk of Vitamin D deficiency include:

- women and children with dark skin
- veiled women and their children
- those living in institutions where access to sunlight is restricted

Vitamin D is the essential for the production of the hormone required for calcium absorption, bone development and growth.

Vitamin D deficiency has been noted in immigrants from the Mediterranean, Middle East, southern Asia and Africa since the 1960s. However, the recent influx of refugees from Africa and the Middle East has seen a resurgence of Vitamin D deficiency as a potentially significant issue. Those most at risk appear to be women who are dark-skinned and/or veiled and their children (Grover et al. 2001; Nozza and Rodda 2001).

What are the causes?

The predominant cause of Vitamin D deficiency in Australia is caused by inadequate exposure to sunlight. This coupled with long term poor access to foods with adequate Vitamin D mean that many refugees are particularly vulnerable.

Ninety per cent of Vitamin D is produced in the skin from the action of sunlight, specifically UV B, with the remaining ten per cent coming from dietary sources. The amount of UV B radiation able to penetrate the skin depends on a number of factors including, latitude, season, smog levels, the actual amount of direct exposure which is further modified by clothing, the use of sun screens and the amount of melanin produced by the skin. Women who are veiled and/or have dark skin are susceptible to Vitamin D deficiency as most clothing effectively absorbs UV B radiation and increased melanin production (ie dark skin) reduces the production of Vitamin D in the skin. This form of Vitamin D made in the skin must undergo conversion to biologically active forms in the liver and then again in the kidney.

What can be done?

Screening

Those at high risk of Vitamin D deficiency should all be screened. This includes those who are dark skinned, women who are veiled and their children and those living in institutions or confined to the indoors. In infants most of the Vitamin D is acquired through maternal transfer, therefore Vitamin D deficiency in mothers is likely to have detrimental consequences for their infants.

Exposure to sunlight

People who are born with naturally dark skin (Type V or VI from the table below) require significant amounts of sun exposure to obtain Vitamin D in an amount equivalent to 1000 IU. This exposure needs to occur in peak ultraviolet periods between 10am and 3pm, 4 times per week between 20 and 30 mins April - September and up to 75 minutes in June and July in Perth. Times will vary in other parts of Australia. Sun protection should be used if exposure is likely to be longer than the recommended times but for people who are truly dark skinned there should be no danger of sunburn. Sunscreen use does inhibit the production of Vitamin D and is probably not necessary for the periods of exposure outlined above.

Table 1. Classification of skin types (adapted from TB Fitzpatrick & JL Bologna, 1995)

| Skin Type Classification | Burns in the sun | Tans after having been in the sun |
|--------------------------|----------------------|-----------------------------------|
| I Melano-compromised | Always | Seldom |
| II Melano-compromised | Usually | Sometimes |
| III Melano-competent | Sometimes | Usually |
| IV Melano-competent | Seldom | Always |
| V Melano-protected | Naturally brown skin | |
| VI Melano-protected | Naturally black skin | |

This paragraph was written by Amanda Samanek from the Cancer Foundation of Western Australia, Inc.

Dietary sources

Ensure adequate access to foods that contain Vitamin D. Vitamin D is found in small quantities in oily fish, eggs, butter and margarine. Unlike countries in the northern hemisphere Australia does not fortify foods with Vitamin D.

It is still unclear as to whether low calcium intakes contribute to the problem of rickets and osteomalacia/osteoporosis caused by Vitamin D deficiency. Certainly in parts of Africa where there is extensive exposure to UV-B radiation, reduced calcium intakes have been implicated in the presentation of rickets in children. Therefore, adequate quantities of calcium rich foods should also be consumed.

Supplementation

There is currently no consensus on the treatment of Vitamin D deficiency in Australia.

Newborn infants are generally not exposed to direct sunlight and breastmilk is a poor source of Vitamin D. Vitamin D stores, even if normal at birth, may become depleted at eight weeks in infants who are exclusively breast fed. Supplementing breast fed infants with 400IU of Vitamin D per day (0.45 mL of Pentavite per day) should maintain Vitamin D stores.

When infants are diagnosed with Vitamin D deficiency Vitamin D levels in their mothers and siblings (whether they are symptomatic or not) should also be assessed. All pregnant women with dark skin and/or with limited access to the sun due to veiling or social isolation should have their Vitamin D levels assessed. During pregnancy and lactation these women require 500-700IU of Vitamin D. If there is a demonstrated Vitamin D deficiency, doses from 1000IU to 3000-4000 IU should be given with reassessment every 3-4 months or at each trimester if pregnant.

References

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