

Vitamin D in acute and chronic disease

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It has emerged over the past 10-20 years that the change in our lifestyle has led to the widespread deficiency of vitamin D. These lifestyle changes include the avoidance of sunlight (voluntary or greater reliance on artificial light), the reduction in the consumption of milk, and the worldwide epidemic of obesity. It is estimated that, worldwide, as many as one billion people may be vitamin D deficient. The elderly are especially vulnerable, but children and younger adults also commonly have deficient levels. Classically, vitamin D deficiency leads to rickets in children (bone deformities) and osteomalacia (demineralisation) of bone in adults.

The discovery of the vitamin D receptor (a nuclear receptor and member of the steroid/thyroid hormone nuclear receptor superfamily) led to the discovery of this receptor in many tissues other than that where it is expected to be found, the kidney. Vitamin D regulates bone metabolism as part of the triad of vitamin D, calcium and parathyroid hormone.

Yet other functions of vitamin D, such as control of cell growth and both innate and acquired immunity, have led to the discovery of vitamin D deficiency and many disease associations, such as cardiovascular disease, many types of cancer (breast, prostate and colon) and autoimmune diseases. Despite strong epidemiological and observational associations between vitamin D deficiency and these diseases, there are conflicting results about the effect of treatment of vitamin D deficiency by supplementation. Indications are that vitamin D supplementation is beneficial. The questions that must be posed are: "Do we really need trial evidence on the benefit of therapy, and should we not treat people prophylactically?" Further research will hopefully provide some evidence and guide future practice.