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The role of vitamin D in cardiovascular disease: From present evidence to future perspectives.

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Abstract

Vitamin D and its metabolites have wide-spread physiological roles far beyond the well described effects in skeletal biology. Many physiological processes are directly or indirectly regulated by vitamin D and in consequence, vitamin D deficiency is implicated in numerous disease conditions. Summarizing previous assumptions on the optimal vitamin D levels in humans these **data point towards calcidiol levels of approximately 30 ng/ml as being sufficient**. The role of vitamin D deficiency in cardiovascular disease is a relatively novel field of interest. Well substantiated experimental data describe convincingly regulatory effects of vitamin D regarding various cardiovascular risk factors such as hypertension and diabetes mellitus. Activation of the vitamin D receptor suppresses e.g. the renin-angiotensin system. These experimental data are strongly supported by epidemiological and observational human data that link vitamin D deficiency to the incidence, degree and prevalence of cardiovascular risk factors and disease conditions. In contrast to the in vivo data and to the homogenous non-interventional observations, we know much less about controlled prospectively evaluated supplementation of vitamin D as a potentially therapeutic agent on cardiovascular events. High quality, large, and randomized controlled trials aiming primarily on cardiovascular end-points are absent. Speculations about the vitamin D usage in prevention or therapy of cardiovascular disease need to take potential drawbacks of vitamin D overdosing into account: **Vitamin D overdosing might induce hypercalcemia, hyperphosphatemia, and increases in fibroblast growth-factor 23**. **The limited evidence regarding vitamin D therapy currently prevents general recommendations for vitamin D application in cardiology.**

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