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## Levels of vitamin D and cardiometabolic disorders: systematic review and meta-analysis.

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### Abstract

Cardiometabolic disorders and vitamin D deficiency are becoming increasingly more prevalent across multiple populations. Different studies have suggested a potential association between abnormal vitamin D levels and multiple pathological conditions including cardiovascular diseases and diabetes. We aimed to evaluate the association between vitamin D levels, using 25-hydroxy vitamin D (25OHD) as an indicator of vitamin D status, and the presence of cardiometabolic disorders including cardiovascular disease, diabetes and metabolic syndrome. We performed a systematic review of the current literature on vitamin D and cardiometabolic disorders using the PubMed and Web of Knowledge databases in September 2009. Studies in adults looking at the effect of vitamin D levels on outcomes relating to cardiometabolic disorders were selected. We performed a meta-analysis to assess the risk of developing cardiometabolic disorders comparing the highest and lowest groups of serum 25OHD. From 6130 references we identified 28 studies that met our inclusion criteria, including 99,745 participants. There was moderate variation between the studies in their grouping of 25OHD levels, design and analytical approach. We found that the highest levels of serum 25OHD were associated with a 43% reduction in cardiometabolic disorders [OR 0.57, 95% (CI 0.48-0.68)]. Similar levels were observed, irrespective of the individual cardiometabolic outcome evaluated or study design. High levels of vitamin D among middle-age and elderly populations are associated with a substantial decrease in cardiovascular disease, type 2 diabetes and metabolic syndrome. If the relationship proves to be causal, interventions targeting vitamin D deficiency in adult populations could potentially slow the current epidemics of cardiometabolic disorders.

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