

Vitamin D and COVID-19: a PubMed-based overview of reviews

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Abstract: Introduction. In recent years, the role of vitamin D for the immune system has been explored. In light of the global burden of COVID-19, this literature overview aims to understand whether vitamin D can be a useful integrative option for COVID-19 prevention. Methods. A PubMed-based overview of reviews (date of search: December 7th, 2020). Results. After database search, 305 articles were found, and 15 reviews were included in this study. From a mechanistic perspective, vitamin D may inactivate some viral compounds, reduce proinflammatory cytokines (NF- κ B, IL-6, TNF), modulate ACE-2 and MMP-9 concentrations, diminish the risk of endothelial dysfunction and bradykinin storm. In a meta-analysis, a positive association between vitamin D deficiency and COVID-19 severity was observed, and other researchers suggested that this association may also involve an increased risk of infection. A preventive role was hypothesized even for diabetic, obese, or pediatric subjects. However, in most reviews, the evidence base was considered insufficient to draw definitive conclusions. In a broad meta-analysis, it was reported that an administration of daily doses of 400-1000 IU vitamin D for up to 12 months was significantly associated with some degree of protection against acute respiratory infections. Some studies indicated that vitamin D serum concentrations of 20–30 ng/mL reduced the risk of acute respiratory infections, while others pointed out that higher levels (up to 40-60 ng/mL) may be preferable for this purpose. Discussion. In conclusion, vitamin D supplementation may be useful for COVID-19, especially in individuals with low levels of this micronutrient. In fact, vitamin D deficiency is associated with a worse disease severity, and possibly with an increased risk of infection. Considering its high tolerability and low costs, further large clinical studies are advised to ascertain whether a standardized supplementation may be a valuable clinical strategy to apply on a large scale.

Keywords: Vitamin D; Supplementation; Preventive Medicine; COVID-19; Coronavirus; Review

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