

Abstract

Vitamin D and COVID-19: A PubMed-Based Overview of Reviews [†]

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Abstract: In recent years, the role of vitamin D in 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. A PubMed-based overview of reviews (date of search: 7 December 2020). After a 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 pro-inflammatory cytokines (NF- κ B, IL-6, TNF), modulate ACE-2 and MMP-9 concentrations, and 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 (OR = 1.64; 95% C.I.: [1.30; 2.09]), 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 administering 400–1000 IU/day of vitamin D for up to 12 months was significantly associated with some degree of protection against acute respiratory infections (OR = 0.70; 95% C.I.: [0.72; 0.93]). 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. 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 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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