

COVID-19 and the biofactor vitamin D₃: The latest news

An adequate vitamin D₃ status can minimise the risk of a viral infection. And even though it has still not been clearly demonstrated without doubt that vitamin D₃ supplements contribute to a milder course of infection and faster recovery from COVID-19 disease or even reduce the mortality rate, positive study results and supplementation recommendations from the scientific community are accumulating.

“**Vitamin D₃ deficiency** can increase susceptibility to viral infections. An adequate vitamin D₃ supply is therefore essential for the function and regulation of the innate and acquired immune system,” emphasises Prof. Hans Georg Classen, Chairman of the Society for Biofactors (GfB). The biofactor can reduce the risk of infection and strengthen immune function by activating cells of the humoral and cellular defence system and reducing pro-inflammatory cytokines.^{1,2,3}

The German Nutrition Society (DGE) also points out the importance of a good **vitamin D₃** supply for immune stabilisation. “The lower the vitamin D₃ status, the higher the risk of infection”. Moreover, in the case of a vitamin D₃ deficit, supplements could have a positive influence on the prevention of acute respiratory infection.⁴ The latter was confirmed by a meta-analysis of more than 11,000 study participants, with people with vitamin D₃ deficiency in particular – more than 60% in Germany anyway – benefiting from supplementation.^{5,6} However, in the view of the DGE, this correlation alone is not yet proof of the positive effect of vitamin D₃ on a COVID-19 infection.

Still no clear evidence

Even though it has been demonstrated that vitamin D₃ deficiency can increase the risk of viral infections, the studies carried out up to now have not produced any consistent results with regard to the benefit of the biofactor in cases of COVID-19. An evaluation of 30 studies from August 2020 was able to show a correlation between vitamin D₃ deficiency and an increased SARS-CoV-2 risk.⁷ Other studies have shown that COVID-19 patients with a severe course of the disease suffer from vitamin D₃ deficiency more often than less seriously ill patients.⁸ However, studies with the opposite result are also known.⁹

“Findings in which it is not documented what the vitamin D₃ status was before the disease should generally be critically evaluated,” emphasised Prof. Classen from the GfB. Vitamin D₃ deficiency can also be a consequence and not a cause of a COVID-19 infection, as vitamin D₃ levels drop sharply for a short time during the non-specific immune response to a strong infection, the so-called acute phase reaction. A Spanish study from October 2020 involving 80 COVID-19 patients dealt with this aspect and took into account the vitamin D₃ status of the

patients before the outbreak of the infection – with the result that pre-existing vitamin D₃ deficiency can indeed increase the risk of a severe course of infection.¹⁰

What can vitamin D₃ supplements achieve?

Results of purely observational studies must nevertheless be assessed with caution, as people with a sufficient vitamin D₃ status may lead healthier lifestyles overall, which could have a cumulative effect on the severity of a COVID-19 infection. A vitamin D₃ deficit also often occurs in patients who already belong to the risk group for a more severe course of the disease – older people.

For this reason, studies in which the effects of vitamin D₃ supplementation on the course of a SARS-CoV-2 infection were tested are interesting. Even though not all studies were able to confirm a potential benefit,¹¹ the much-cited Córdoba study showed positive impacts of vitamin D₃ administration. 50 out of 76 COVID-19 patients received cholecalciferol in addition to the normal therapy in a dosage of more than 40,000 IU in the first week and only one individual from this group – corresponding to 2% – had to receive intensive care treatment. Of the 26 people in the control group, this was the case in 13 patients (50%) and two patients died.¹² However, patients in the control group were twice as likely to suffer from hypertension and three times as likely to have diabetes mellitus – known risk factors for a more severe course of the infection. However, this limiting correlation was statistically reviewed again – and it was possible to show that the lower risk of intensive care treatment was not linked to the pre-existing conditions, but instead to vitamin D₃ supplementation after all.¹³

A recent statement from June 2021 by Prof. Hermann Brenner from the DKFZ in Heidelberg also claims that “study results consistently show that COVID-19 patients with untreated vitamin D deficiency or insufficiency have a more than 10-fold increase in their risk of a severe or lethal course compared to patients with a sufficient vitamin D₃ status or supplementation.”^{14,15,16} And even though the results of large intervention studies are still outstanding, in the opinion of epidemiologist Brenner, vitamin D₃ supplementation should not be withheld from COVID-19 patients in view of the positive findings and the negligible side effects of daily doses of 800 to 1,000 – and sometimes up to 4,000 – IU.

Clear recommendation: Vitamin D₃ in patients at risk and those who are deficient

The COVRIIN expert group, which supports and advises the Robert Koch Institute, has evaluated the study material of vitamin D₃ supplementation and has not issued any standard approval recommendation: “Outside of controlled studies, no recommendation can yet be issued on the use of vitamin D₃ in the therapy or prophylaxis of SARS-CoV-2 infections,” according to the official statement of January 2021.¹⁷

However, the group of experts confirms that there are indications that the risk of COVID-19 taking a severe course is increased in the case of vitamin D₃ deficiency, as well as evidence of a reduced risk of the

need for treatment in an ICU with vitamin D₃ supplementation and evidence of faster virus elimination with vitamin D₃ supplementation in the presence of vitamin D₃ deficiency. Based on the results published so far, COVRIIN therefore recommends vitamin D₃ substitution in patients with a confirmed or suspected deficiency who are at an increased risk for COVID-19 or already have COVID-19 disease, as well as substitution in critically ill patients with confirmed vitamin D₃ deficiency (≤ 30 nmol/l) according to the recommendations of the German Society of Endocrinology and the current guidelines of the German Society of Nutritional Medicine.

Biofactor vitamin D₃:

No across-the-board therapeutic, but avoid deficiency

There have so far not been any large clinical intervention studies for a general recommendation of vitamin D₃ supplementation in COVID-19. However, there are increasing numbers of positive findings and recommendations from science to consider targeted supplementation of the biofactor, at least in the case of risk groups and confirmed vitamin D₃ deficiency.

Further information on vitamin D₃ can be found [here](#).

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