

Scientific Studies Performed on Vitamin D and Zinc in the treatment and prevention of COVID-19

VITAMIN D

25 eligible randomized controlled trials of 11,321 participants, aged 0 to 95 years were identified. Vitamin D supplementation reduced the risk of acute respiratory tract infection among all participants. In subgroup analysis, protective effects were seen in those receiving daily or weekly vitamin D without additional bolus doses but not in those receiving one or more bolus doses.

[Reference](#)

Mean levels of vitamin D for 20 European countries and morbidity and mortality caused by COVID-19 were acquired. Negative correlations between mean levels of vitamin D in each country and number of COVID-19 cases were observed. Vitamin D levels are severely low in the aging population especially in Spain, Italy, and Switzerland. This is also the most vulnerable group of the population in relation to COVID-19.

[Reference](#)

Vitamin D deficiency is common in Europe and the Middle East. One meta-analysis of randomized controlled trials of vitamin D on acute respiratory infection showed that vitamin D in a daily or weekly dose reduced the risk of acute respiratory infection by 12%, the results being larger in those with baseline serum 24(OH)D <25nmol/L. The European Calcified Tissue Society (ECTS) advises to improve vitamin D status by food fortification and the use of vitamin D supplements in risk groups. Recommended doses by the ECTS are as follows: A vitamin D supplement of 400IU/day for children 0-1 year. A vitamin D supplement of 400-600IU/day for all pregnant women. A vitamin D supplement of 400-800IU/day for all older institutionalized subjects and should be considered for all older persons above 70 years.

[Reference](#)

In a multivariate analysis, a positive COVID-19 test was significantly more likely in those with likely vitamin D deficiency than in those with likely sufficient vitamin D levels at the time of COVID-19 testing.

[Reference](#)

Men with lowest free 25(OH)D levels (<4.43 ng/L) had a 91% increased risk for all-cause mortality compare to those with the very highest amount of free 25(OH)D. 25(OH)D is the prohormone that is converted to 1.25(OH)₂D which is considered the “active” form of vitamin D in the body.

[Reference](#)

Several groups of researchers from different countries have found that the sickest patients often have the lowest levels of vitamin D, and that countries with higher death rates had larger numbers of people with vitamin D deficiency than countries with lower death rates.

[REFERENCE.](#)

Participants positive for COVID-19 were 50% more likely to have low vs normal 25(OH)D levels in a multivariate analysis that controlled for other confounders.

[REFERENCE](#)

The main finding of our study was the significant association of low plasma vitamin D level with the likelihood of COVID-19 infection among patients who were tested for COVID-19, even after adjustment for age, gender, socio-economic status and chronic, mental and physical disorders.

[REFERENCE.](#)

In the United States, for example, the COVID-19 mortality rate among blacks and Hispanic Americans is higher than among the general population, and it is well established that these groups have lower levels of vitamin D, compared with other groups.

[REFERENCE.](#)

To reduce the risk of infection, it is recommended that people at risk of influenza and/or COVID-19 consider taking 10,000 IU/d of vitamin D3 for a few weeks to rapidly raise 25(OH)D concentrations, followed by 5000 IU/d.

[REFERENCE.](#)

The researchers noted that patients from countries with high COVID-19 mortality rates, such as Italy, Spain and the UK, had lower levels of vitamin D compared to patients in countries that were not as severely affected.

[REFERENCE.](#)

Another recent Indonesian retrospective cohort study of 780 Covid-19 patients indicated that the majority of death cases had below-normal vitamin D levels and that vitamin D status was strongly associated with Covid-19 mortality.

[REFERENCE.](#)

In the meta-analysis, vitamin D supplementation has been shown as safe and effective against acute respiratory tract infections. Thus, people who are at higher risk of vitamin D deficiency during this global pandemic should consider taking vitamin D supplements to maintain the circulating 25(OH)D in the optimal levels (75-125nmol/L).

[REFERENCE.](#)

Vitamin D deficiency that is not sufficiently treated is associated with COVID-19 risk. We concluded that the daily supplementation of 2000-5000 IU/day of vitamin D3 in older adults with PD (Parkinson's Disease) has the potential to slow the progression of PD while also potentially offering additional protection against COVID-19.

[REFERENCE.](#)

Vitamin D proved to interact both with the innate immune system, by activating Toll-like receptors (TLRs) or increasing the levels of cathelicidins and β -defensins, and adaptive immune system, by reducing immunoglobulin secretion by plasma cells and pro-inflammatory cytokine production, thus modulating T cell function.

[REFERENCE.](#)

A study published on May 6th, has produced optimism that vitamin D may help to prevent serious infections of the COVID-19 virus. Researchers from the UK have compiled data on the incidence of COVID-19 infections and correlated it to the blood levels of vitamin D in people from 20 European nations. The results show that as vitamin D serum levels increase, the incidence of infection decreases

[REFERENCE.](#)

Vitamin D supplementation was safe and it protected against acute respiratory tract infection overall.

[REFERENCE.](#)

Researchers found that in countries that were hit particularly hard by the virus, the population had, on the average, lower levels of vitamin D. For instance, in Italy the average is 28 nmol/L, whereas in the Nordic countries, which fared much better, the average is 45 nmol/L

[REFERENCE.](#)

ZINC

In a retrospective analysis of symptomatic COVID-19 patients admitted to a tertiary university hospital in Barcelona, Spain from March 15 to April 30, 2020, it was found that having a plasma zinc level lower than 50µg/dl at admission was associated with a 2.3 times increased risk of in-hospital death compared with patients with a plasma zinc level of 50µg/dl or higher. Each unit increase of plasma zinc at admission to hospital was associated with a 7% reduced risk of in-hospital mortality.

[Reference](#)

Due to its direct antiviral properties, it can be assumed that zinc administration is beneficial for most of the population, especially those with suboptimal zinc status.

[Reference](#)

Zinc may possess protective effect as preventive and adjuvant therapy of COVID-19 through reducing inflammation, improvement of mucociliary clearance, prevention of ventilator-induced lung injury, modulation of antiviral and antibacterial immunity.

[Reference](#)