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Editorial

Vitamin D supplementation for COVID-19: is it necessary?

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A B S T R A C T

The development of the COVID-19 vaccine is currently quite encouraging amid increasing mortality and transmission of the COVID-19 virus in various countries. Apart from vaccination, the government also needs to consider vitamin D supplementation policies because it has a significant role in boosting the immune system.

The world health organization (who) currently records as many as 79,673,754 patients confirmed positive for COVID-19 and the number of deaths reaching 1,761,381 people worldwide[1]. Several vaccines have been developed to prevent the transmission of COVID-19 by several pharmaceutical companies in various countries. It is recorded that more than 60 vaccine candidates have been being formulated, and some even have had their distribution permit from the food and drug administration of several countries[2]. However, implementation of the community has not been carried out yet due to several issues, including their effectiveness and safety of the vaccine itself.

Amid the increasing mortality and transmission of the COVID-19 virus and the fact that the vaccine is not ready, maintaining a robust immune system is the key to protecting our bodies. Vitamin D has a vital role in the case. Calcitriol (active vitamin D)-- 1,25-dihydroxycholecalciferol ($1,25(OH)_2D$)-- is the active form of vitamin D from 7-dehydrocholesterol from the consumption of milk, cereal, cheese, and fish oil plus ultraviolet B radiation (UVB) on the skin with the help of liver and kidney enzymes[3].

Previous studies have shown that vitamin D can reduce the risk of respiratory tract infections and increase adaptive cellular immunity[4–8]. Other studies with clinical outcomes of COVID-19 patients based on vitamin D status have proved their crucial role in the prevention measure and the treatment of COVID-19 patients. Its deficiency is significantly associated with an increased risk of COVID-19[9]. Patients with severe COVID-19 had more vitamin D deficiency than those with mild cases (OR = 1.64; 95% CI = 1.30-2.09) and increased hospitalization (OR = 1.81, 95% CI = 1.41- 2.21) and death (OR = 1.82, 95% CI = 1.06-2.58)[10].

Although no clinical trials have been conducted to determine the specific effects of vitamin D in suppressing COVID-19, a research with a quasi-experimental design regarding the provision of bolus vitamin D3 supplementation in the elderly with COVID-19 obtained results that giving vitamin D3 supplementation by bolus during or just before COVID-19 has an impact on the severity and better survival rates[11].

The policy of vitamin supplementation has been implemented in Indonesia, namely the Minister of Health Regulation number 21 of 2015 on the provision of vitamin A 100,000 IU supplementation for infants aged six to eleven months, vitamin a 200,000 IU for children of twelve to fifty-nine months, and high doses of post-partum mothers to reduce the risk of morbidity and mortality for mothers and children under five. However, for vitamin D supplementation policies, long-term prospective intervention studies are needed to ensure that it can help prevent and treat COVID-19.

Although specific clinical trials have not been undertaken, research reviews show that the vitamin is useful in increasing immunity. The recommendations of the studies can serve as a basis for consideration for vitamin D supplementation. They argue that an optimal vitamin D level in the body should be maintained in the range of 100–150 nmol/l (40–60 ng/ml). Taking vitamin D at doses of 1000–4000 IU/day can maintain vitamin D levels ≥30 ng/ml and is beneficial for patients with chronic disease. The sun exposure to the arms and legs (18% of body surface) at 11.00-14.00, until the skin turns slightly reddish, is equivalent to about 3600 IU of cholecalciferol supplementation. If this is regularly practiced three times a week, it will provide a good vitamin D[12].

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REFERENCES

1. World Health Organization. *WHO Coronavirus Disease (COVID-19) Dashboard*.; 2020. https://covid19.who.int.
2. World Health Organization. *Draft Landscape of COVID-19 Candidate Vaccines*.; 2020. https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines.
3. Bikle DD. Vitamin D metabolism, mechanism of action, and clinical applications. *Chem Biol*. 2014;21(3):319-329. doi:10.1016/j.chembiol.2013.12.016
4. Hughes DA, Norton R. Vitamin D and respiratory health. *Clin Exp Immunol*. 2009;158(1):20-25. doi:10.1111/j.1365-2249.2009.04001.x
5. Shi Y, Liu T, Yao L, et al. Chronic vitamin D deficiency induces lung fibrosis through activation of the renin-angiotensin system. *Sci Rep*. 2017;7(1):3312. doi:10.1038/s41598-017-03474-6
6. Zhou Y-F, Luo B-A, Qin L-L. The association between vitamin D deficiency and community-acquired pneumonia: A meta-analysis of observational studies. *Medicine (Baltimore)*. 2019;98(38):e17252-e17252. doi:10.1097/MD.0000000000017252
7. Bergman P, Lindh AU, Björkhem-Bergman L, Lindh JD. Vitamin D and Respiratory Tract Infections: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *PLoS One*. 2013;8(6):e65835-e65835. doi:10.1371/journal.pone.0065835
8. Jolliffe DA, Greenberg L, Hooper RL, et al. Vitamin D supplementation to prevent asthma exacerbations: a systematic review and meta-analysis of individual participant data. *Lancet Respir Med*. 2017;5(11):881-890. doi:https://doi.org/10.1016/S2213-2600(17)30306-5
9. Katz J, Yue S, Xue W. Increased risk for Covid-19 in patients with Vitamin D deficiency. *Nutrition*. December 2020:111106. doi:10.1016/j.nut.2020.111106
10. Pereira M, Dantas Damascena A, Galvão Azevedo LM, de Almeida Oliveira T, da Mota Santana J. Vitamin D deficiency aggravates COVID-19: systematic review and meta-analysis. *Crit Rev Food Sci Nutr*. November 2020:1-9. doi:10.1080/10408398.2020.1841090
11. Annweiler C, Hanotte B, Grandin de l'Eprevier C, Sabatier J-M, Lafaie L, Célarier T. Vitamin D and survival in COVID-19 patients: A quasi-experimental study. *J Steroid Biochem Mol Biol*. 2020;204:105771. doi:10.1016/j.jsbmb.2020.105771
12. Lahoor Basha S, Suresh S, Ashok Reddy V V, Surya Teja SP. Is the shielding effect of cholecalciferol in SARS CoV-2 infection dependable? An evidence based unraveling. *Clin Epidemiol Glob Heal*. 2021;9:326-331. doi:10.1016/j.cegh.2020.10.005