

LETTER TO EDITOR

Do we need vitamin D screening and supplementation in critically ill patients?

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Dear Editor

Vitamin D deficiency or insufficiency affects about 30% of children and 60% of adults across the world (1). This condition also occurs in about 70% of critically ill patients (2). Although vitamin D is typically known as a fat-soluble vitamin in bone metabolism, it is a steroid hormone with pleiotropic effects (3). Vitamin D deficiency can lead to cardiovascular, neurological, and autoimmune diseases and different types of cancers, including the breast, prostate, lung, colon, and renal cancers. Accordingly, this deficiency has a direct correlation with mortality (4-6).

Many critically ill patients enter the Intensive Care Unit (ICU) with a deficient level of vitamin D. Disrupted metabolism of vitamin D in some critically ill patients results in a fast decrease in vitamin D levels after ICU admission (7). It has been well documented that vitamin D deficiency is associated with increased morbidity, mortality, and ICU length of stay (8, 9). The randomized clinical trials having been performed in recent years are indicative of no significant improvement in the clinical outcome of critically ill patients supplemented with vitamin D (10).

The ICU admission can be predicted in several conditions, such as some elective surgeries and intensive chemotherapies (7). Furthermore, one of the problems of the studies performed till now is that they have not exclusively investigated the

patients with vitamin D deficiency. However, the exclusive inclusion of patients with vitamin D deficiency can lower the sample size for a clinical trial.

It is required to perform randomized clinical trials with a reasonable sample size to investigate the effect of vitamin D supplementation among vitamin D deficient patients who are in a critical medical state. These studies will be useful for the better conceptualization of treatment with vitamin D in critically ill patients.

Conflicts of Interest

There is no conflict of interest to be declared.

References

1. Daly RM, Gagnon C, Lu ZX, Magliano DJ, Dunstan DW, Sikaris KA, et al. Prevalence of vitamin D deficiency and its determinants in Australian adults aged 25 years and older: a national, population-based study. *Clin Endocrinol (Oxf)*. 2012; 77(1):26-35. [PMID: 22168576](#) [DOI: 10.1111/j.1365-2265.2011.04320.x](#)
2. Dickerson RN, Van Cleve JR, Swanson JM, Maish GO 3rd, Minard G, Croce MA, et al. Vitamin D deficiency in critically ill patients with traumatic injuries. *Burns Trauma*. 2016; 4(1):28. [PMID: 27833924](#) [DOI: 10.1186/s41038-016-0054-8](#)
3. Christakos S, Dhawan P, Verstuyf A, Verlinden L, Carmeliet G. Vitamin D: metabolism, molecular mechanism of action, and pleiotropic effects. *Physiol*



- Rev. 2015; 96(1):365-408. [PMID: 26681795](#) [DOI: 10.1152/physrev.00014.2015](#)
4. Mondul AM, Weinstein SJ, Layne TM, Albanes DJ. Vitamin D and cancer risk and mortality: state of the science, gaps, and challenges. *Epidemiol Rev.* 2017; 39(1):28-48. [PMID: 28486651](#) [DOI: 10.1093/epirev/mxx005](#)
 5. Mozos I, Marginean OJ. Links between vitamin D deficiency and cardiovascular diseases. *Biomed Res Int.* 2015; 2015:109275. [PMID: 26000280](#) [DOI: 10.1155/2015/109275](#)
 6. Mpandzou G, Ait Ben Haddou E, Regragui W, Benomar A, Yahyaoui M. Vitamin D deficiency and its role in neurological conditions: a review. *Rev Neurol (Paris).* 2016; 172(2):109-22. [PMID: 26867662](#) [DOI: 10.1016/j.neurol.2015.11.005](#)
 7. Amrein K, Papinutti A, Mathew E, Vila G, Parekh D. Vitamin D and critical illness: what endocrinology can learn from intensive care and vice versa. *Endocr Connect.* 2018; 7(12):R304-15. [PMID: 30352414](#) [DOI: 10.1530/EC-18-0184](#)
 8. Zhang YP, Wan YD, Sun TW, Kan QC, Wang LX. Association between vitamin D deficiency and mortality in critically ill adult patients: a meta-analysis of cohort studies. *Crit Care.* 2014; 18(6):684. [PMID: 25498305](#) [DOI: 10.1186/s13054-014-0684-9](#)
 9. de Haan K, Groeneveld AB, de Geus HR, Egal M, Struijs A. Vitamin D deficiency as a risk factor for infection, sepsis and mortality in the critically ill: systematic review and meta-analysis. *Crit Care.* 2014; 18(6):660. [PMID: 25475621](#) [DOI: 10.1186/s13054-014-0660-4](#)
 10. Langlois PL, Szwec C, D'Aragon F, Heyland DK, Manzanares W. Vitamin D supplementation in the critically ill: a systematic review and meta-analysis. *Clin Nutr.* 2018; 37(4):1238-46. [PMID: 28549527](#) [DOI: 10.1016/j.clnu.2017.05.006](#)