

Role of Blood Levels for Vitamin D₃ and Viral Infections: COVID-19 and Influenza

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Abstract

The global COVID-19 pandemic has been devastating in terms of illness and loss of life. Although deaths have gone down substantially since the beginning of the pandemic, COVID-19, along with influenza, continues to have a significant impact on global health. Recent studies have shown a strong correlation between Vitamin D₃ blood levels before infection and severity of symptoms and mortality, for both viruses. Preliminary research findings suggest that proactive Vitamin D₃ supplementation should be considered as a measure to fight infection and prevent death.

Introduction

Vitamin D is an essential component of the immune system and may have a role in mitigating severe infections, particularly COVID-19 and influenza. Both viral infections are associated with deficiencies in Vitamin D₃ (Grant et al, 2020). Preventative measures such as lockdowns and social distancing limited sunlight exposure, posing a challenge to maintain adequate levels of Vitamin D₃. Strategies are needed to ensure sufficient Vitamin D₃ levels.

Vitamin D₃ is synthesized in our bodies in response to skin exposure to sunlight and is also available from dietary sources and via supplementation. Notably, it is estimated that as much as 24 percent of the US population is deficient (Cui et al, 2022). The RDA for Vitamin D₃ is 600 (IU)/day for adults and 800 (IU)/day if over 70. For adults, a serum Vitamin D₃ concentration of 20 (ng/mL) or above is considered sufficient. Given the potential of Vitamin D₃ in improving immune system health and its involvement in fighting infections, maintaining appropriate blood levels of Vitamin D₃ is very important.

Discussion

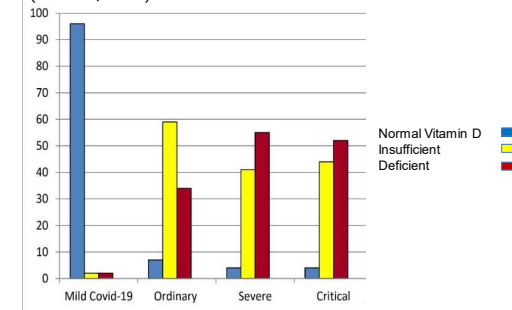
- Meta analysis showed an association between Vitamin D deficiency and COVID-19 infection, COVID-19 related hospitalization, COVID-19 related ICU admission and COVID-19 related mortality (Chiodini et al, 2021).
- As depicted in Figure 1, in a study of 212 hospitalized COVID-19 patients, 96% of those with mild COVID-19 had normal vitamin D levels. In contrast, over 50% of the patients with severe or critical COVID-19 were vitamin D deficient (Benskin, 2020).
- Raising serum Vitamin D levels above 50 ng/mL prior to infection has been shown to prevent or mitigate COVID-19 (Borsche et al., 2021).
- Patients on Vitamin D supplementation prior to infection showed greater risk reduction in mortality risk in older populations and at higher altitudes. (D'Ecclesiis et al., 2022).
- It has been recommended that people at risk for influenza and COVID-19 take 10,000 IU/d of Vitamin D₃ for a few weeks to raise their serum levels to 40-60 ng/mL, as a preventative measure (Grant et al, 2020).
- Maintaining appropriate Vitamin D₃ levels through sun exposure, diet and supplementation is an important strategy in reducing the severity of COVID-19 and influenza. Maintaining optimal levels should be a public health priority.



References

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Figure 1: Severity of COVID-19 and Vitamin D Levels (Benskin, 2020)



Conclusion

The COVID-19 pandemic has highlighted the critical role of Vitamin D₃ in infection prevention and severity. Convincing new evidence indicates a correlation between pre-infection Vitamin D levels and a better prognosis for COVID-19 and influenza. While Vitamin D₃ supplementation during infection hasn't shown improvement in outcomes, individuals maintaining the recommended 40-60 ng/mL Vitamin D levels before infection have a markedly lower risk of mortality. Strategies to ensure adequate Vitamin D₃ levels through sunlight, diet and supplementation are crucial for mitigating severe infections. It is vitally important for individuals to have their vitamin D₃ blood levels checked annually and to work with their health care provider to reach and maintain optimal blood levels of this life-saving vitamin.

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