(24) infection in children. These studies with controversial results indicate that vitamin D effect on prevention of infections including respiratory infections is too small and larger sample size is needed to clarify possible roles of this vitamin. It should be remember that respiratory infections are the leading cause of sepsis in US which indirectly demonstrate the Vitamin D could partly prevent sepsis at least by declining respiratory infections incidences (25).

Vitamin D and the Seasonal Variation in Sepsis

In a large prospective study in USA between 1979 and 2003, a seasonal variation observed about sepsis incidence in national hospitals setting. In this way, the heaviest load of patients with sepsis and severe sepsis was related to winter, though the least patients administered to hospitals with sepsis related to fall. This difference was statistically significant and it was more prominent in Northeast USA (26). The same seasonal pattern was seen in patients with respiratory infections, as the most prevalent cause of sepsis (26).

Serum 25(OH)D levels varied annually as well, which is in the highest level in fall and its lowest serum level could be seen at the end of winter (27). This variation could be explained by variation of solar zenith angle in different seasons and subsequent variation of the amount of ultraviolet-B (UVB) radiation which is necessary in order to vitamin D is produced through the skin (28). Variation in amount of UVB is more prominent in the regions farther to equator. It seems that this hypothesis could relate parallel seasonal variation of vitamin D to respiratory infections and sepsis. However it should be remind that there are numerous defined and undefined factors which could play role in vitamin D synthesis (28,29).

Conclusion

Various roles of vitamin D in different body systems and especially immune system raise attentions to this hypothesis that vitamin D is a key component in defending against invading pathogens. Both basic science and clinical studies emphasize on immunomodulatory functions of vitamin D in preventing infections including respiratory infections which are the leading cause of sepsis. No study is available right now which demonstrate an obvious relationship between sepsis incidence and severity and vitamin D serum levels. Parallel seasonal patterns of sepsis and vitamin D serum levels and also the results of some observational and interventional studies could be enough reasons in order to conduct studies to uncover possible relationships between vitamin D and sepsis. If any relationships found, vitamin D supplementation could be an effective and safe way in order to decrease economical and social burden of sepsis as well as promoting hygiene level of society.

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Conflict of Interest

The authors declare no conflict of interest.

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