Potential Dietary Interventions for the Prevention and Treatment of Coronavirus Disease 2019

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Introduction:

Coronavirus disease 2019 (COVID-19) is a viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The present outbreak of this novel disease has been labeled as a global pandemic by the World Health Organization. Therefore, there is an urgent need to identify potential interventions for the management of COVID-19. It is noteworthy that some micronutrients can function as immunity enhancers or antiviral agents and help the human body to fight against this communicable disease.

Vitamin D:

SARS-CoV-2 infects cells through binding to angiotensin-converting enzyme 2 (ACE2) and simultaneously disturbs the renin-angiotensin system to produce more angiotensin II. This phenomenon results in vasoconstriction, inflammation, oxidative stress, and apoptosis. Vitamin D can induce the expression of ACE2, decrease the formation of angiotensin II, and reduce injuries caused by COVID-19.

Vitamin C:

Tissue and serum concentrations of lactate rise in COVID-19 critically ill patients. Lactate reduces the production of type I interferon, and therefore, decreases viral clearance. Vitamin C can lower lactate levels and help patients to survive.

Alpha-lipoic acid:

It seems that low intracellular pH is the most important factor for SARS-CoV-2 cellular entry. Alpha-lipoic acid can increase intracellular pH by the activation of Na^+/K^+-ATPase and inhibit the virus entry.

Zinc:

Viral replication plays a critical role in disease progression. Interestingly, increasing the concentration of intracellular zinc can efficiently impair or inhibit the replication of a variety of RNA viruses, including SARS-CoV-2.

Selenium:

As we mentioned before, viral replication plays a key role in disease progression. Selenium may indirectly interact with the main protease of SARS-CoV-2. In addition, its deficiency induces not only impairment of host immune system, but also rapid mutation of benign variants of RNA viruses to virulence.

Conclusion:

In conclusion, it seems that some dietary supplements have a potential to prevent and treat COVID-19.

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