

The Significance Of Vitamin C And Vitamin D Supplements In The Prevention And Treatment of COVID-19

Ashok.M

Department of Community Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, (Deemed to be University), Wardha, Maharashtra, India

Authors:

Ashok.M

Department of Community Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, (Deemed to be University), Wardha, Maharashtra, India

Received Date: Dec 30, 2022

Accepted Date: Jan 10, 2023

Published Date: Jan 28, 2023

Abstract

The Corona virus sickness, which was first publicly announced as a health emergency in January 2020 and was then designated a pandemic on March 11, 2020, is currently wreaking havoc over the world and has mutated quickly, making it a full nuisance for the medical community. Symptoms consist of a severe respiratory distress syndrome, a dry cough, weakness and exhaustion, fever, severe pneumonia, loss of taste or smell, and possibly even death. By releasing nln amounts of chemokines and ponlmmo cytokines, this virus induces systemic immunological feedback or a cytokine storm. Nutrition is important since new variations are being identified, such omicron, which is known to have shown resistance to the vaccines now being utilised.

Unquestionably a crucial aspect of keeping a robust and long-lasting immunity against the Corona virus disease. The best strategy to support infected people's immunity among the broader community is becoming a challenge. Important dietary ingredients like vitamin C and vitamin D have well-documented effects related to immunomodulation, increased immunity, and attenuation of heavy and unrestrained immune response activation, which leads to a decrease in viral yield and an increase in the survival rates of people with corona virus infection. The role and significance of vitamins C and D in connection to the prevention and treatment of infection have been highlighted and explored in the review that follows. Efforts to support immunity are facing difficulties. ideally, in the population at large, of affected people.

Discussion

By consuming enough vitamin D and getting enough sun, one can achieve healthy levels of vitamin D in the body. The National Health and Nutrition Survey (NHANES) 2001–2006 found an inverse relationship between 25-hydroxy vitamin D levels and acute respiratory illness [67]. The virus particle's binding receptor, ACE II, balances the activity of

the renin-angiotensin system and, as a result, plays a protective function hostile to the growth of viral illness sequelae. Additionally, a number of studies have linked a lack of vitamin D to COVID-19 [69,70]. Importantly, states with high latitudes (>37 degrees) have a higher death prevalence rate from COVID-19 than ones with low altitudes. Antimicrobial properties of vitamin D can be seen in the body by creating peptides like catholicity and defence that have antibacterial properties [78].

References:

1. McIntosh K, Perlman S. Coronaviruses, including Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). Mandell, Douglas, and Bennett's principles and practice of infectious diseases. Elsevier, 2 nd Edition, 2015; 1928-1936.
2. Fields NB, Knipe MD, Howley MP. Fields virology. Lippincott Williams and Wilkins, 5 th Edition, Philadelphia, 2006.
3. Peters BM, Shirtliff ME, Jabra Rizk MA. Antimicrobial peptides: Primeval molecules or future drugs? Plos Pathog 2010; 6:e1001067.
4. Bonilauri P, Rugna G. Animal Coronaviruses and SARS-CoV-2 in animals, what do we actually know? Life 2021; 11:123.
5. World Health Organisation (WHO). Coronavirus (COVID-19) dashboard. Department of Human Health Srvce, 2021.
6. Perez Saez J, Lauer SA, Kaiser L, et al. Serology informed estimates of SARS-CoV-2 infection fatality risk in Geneva, Switzerland. Lancet Infect Dis 2021; 21:e69-70.
7. Gold MS, Schayek D, Gabrielli S, et al. COVID-19 and comorbidities: A systematic review and metaanalysis. Postgrad Med 2020; 132:749–755.
8. Jain V, Yuan JM. Predictive symptoms and comorbidities for severe COVID-19 and intensive care unit admission: A systematic review and meta-analysis. Int J Public Health 2020; 65:533–546.
9. Pan D, Sze S, Minhas JS, et al. The impact of ethnicity on clinical outcomes in COVID-19: A systematic review. E Clin Med 2020; 23:100404.
10. Barazzoni R, Bischoff SC, Breda J, et al. ESPEN expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection. Clin Nutr 2020; 39:1631–1638.
11. Zhang L, Liu Y. Potential interventions for novel Coronavirus in

- China: A systematic review. *J Med Virol* 2020; 92:479–490.
12. Fowler AA, Truwit JD, Hite RD, et al. Effect of vitamin C infusion on organ failure and biomarkers of inflammation and vascular injury in patients with sepsis and severe acute respiratory failure: The CITRIS-ALI randomized clinical trial. *JAMA* 2019; 322:1261–1270.
 13. Waqas Khan HM, Parikh N, Megala SM, et al. Unusual early recovery of a critical COVID-19 patient after administration of intravenous vitamin C. *Am J Case Rep* 2020; 21:e925521.
 14. Drouin G, Godin JR, Page B. The genetics of vitamin C loss in vertebrates. *Curr Genomics* 2011; 12:371–378.
 15. Milton K. Micronutrient intakes of wild primates: Are humans different? *Comp Biochem Physiol A Mol Integr Physiol* 2003; 136:47–59.
 16. Milton K. Nutritional characteristics of wild primate foods: Do the diets of our closest living relatives have lessons for us? *Nutrition* 1999; 15:488–498.
 17. EFSA Panel on Dietetic Products, Nutrition and Allergies. Scientific opinion on dietary reference values for vitamin C. *EFSA J* 2013; 11.
 18. Bates B, Collins D, Cox L, et al. National diet and nutrition survey years 1 to 9 of the rolling programme (2008/2009–2016/2017): Time trend and income analyses. *Public Health England: London, UK*, 2019:56.
 19. Levine M, Conry Cantilena C, Wang Y, et al. Vitamin C pharmacokinetics in healthy volunteers: Evidence for a recommended dietary allowance. *USA. Proc Natl Acad Sci* 1996; 93:3704–3709.
 20. Levine M, Wang Y, Padayatty SJ, et al. A new recommended dietary allowance of vitamin C for healthy young women. *Proc Natl Acad Sci USA*. 2001; 98:9842–9846.
 21. Padayatty SJ, Sun H, Wang Y, et al. Vitamin C pharmacokinetics: Implications for oral and intravenous use. *Ann Intern Med* 2004; 140:533–537.
 22. de Grooth HJ, Manubulu Choo WP, Zandvliet AS, et al. Vitamin C pharmacokinetics in critically ill patients: A randomized trial of four IV regimens. *Chest* 2018; 153:1368–1677.
 23. Hume R, Weyers E. Changes in leucocyte ascorbic acid during the common cold. *Scott Med J* 1973; 18:3–7.
 24. Evans Olders R, Eintracht S, Hoffer LJ. Metabolic origin of hypovitaminosis C in acutely hospitalized patients. *Nutrition* 2010; 26:1070–1074.
 25. Teixeira A, Carrie AS, Genereau T, et al. Vitamin C deficiency in elderly hospitalized patients. *Am J Med* 2001; 111:502.
 26. Fain O, Paries J, Jacquart B, et al. Hypovitaminosis C in hospitalized patients. *Eur J Intern Med* 2003; 14:419–425.
 27. Gan R, Eintracht S, Hoffer LJ. Vitamin C deficiency in a university teaching hospital. *J Am Coll Nutr* 2008; 27:428–433.
 28. Ravindran P, Wiltshire S, Das K, et al. Vitamin C deficiency in an Australian cohort of metropolitan surgical patients. *Pathology* 2018; 50:654–658.
 29. Hemila H, Louhiala P. Vitamin C may affect lung infections. *J R Soc Med* 2007; 100:495–498.
 30. Myint PK, Wilson AM, Clark AB, et al. Plasma vitamin C concentrations and risk of incident respiratory diseases and mortality in the European prospective investigation into cancer norfolk population based cohort study. *Eur J Clin Nutr* 2019; 73:1492–1500.
 31. Hemila H, Louhiala P. Vitamin C for preventing and treating pneumonia. *Cochrane Database Syst Rev* 2013; 8:CD005532.
 32. Marik PE. Vitamin C: An essential “stress hormone” during sepsis. *J Thorac Dis* 2020; 12:S84–S88.
 33. Marik PE. Vitamin C for the treatment of sepsis: The scientific rationale. *Pharmacol Ther* 2018; 189:63–70.
 34. Colunga Biancatelli RML, Berrill M, Marik PE. The antiviral properties of vitamin C. *Expert Rev Anti Infect Ther* 2020; 18:99–101.
 35. Thomas WR, Holt PG. Vitamin C and immunity: An assessment of the evidence. *Clin Exp Immunol* 1978; 32:370–379.
 36. Dahl H, Degre M. The effect of ascorbic acid on production of human interferon and the antiviral activity in vitro. *Acta Pathol Microbiol Scand B* 1976; 84B:280–284.
 37. Webb AL, Villamor E. Update: Effects of antioxidant and non-antioxidant vitamin supplementation on immune function. *Nutr Rev* 2007; 65:181–217.
 38. Hemila H. Vitamin C and infections. *Nutrients* 2017; 9:339.
 39. Carr A, Maggini S. Vitamin C and immune function. *Nutrients* 2017; 9:1211.
 40. Wang Y, Russo TA, Kwon O, et al. Ascorbate recycling in human neutrophils: Induction by bacteria. *USA. Proc Natl Acad Sci* 1997; 94:13816–13819.
 41. Nualart FJ, Rivas CI, Montecinos VP, et al. Recycling of vitamin C by a bystander effect. *J Biol Chem* 2003; 278:10128–10133.