

Vitamins Play a Role in Covid-19

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Date of Submission: 01-07-2021

Date of Acceptance: 13-07-2021

ABSTRACT; A **vitamin** is a organic molecule (or a set of molecules closely related chemically, i.e. vitamins) that is an essential micronutrient which an organism needs in small quantities for the proper functioning of its metabolism. Essential nutrients cannot be synthesized in the organism, either at all or not in sufficient quantities, and therefore must be obtained through the diet.

The COVID-19 pandemic has created a global health crisis posing an unprecedented public health emergency. The number of deaths and people being infected is increasing daily throughout the globe. This situation is much more severe due to possible devastating situations because of several social and economic factors. Effective management to address this infection is still evolving, and attempts are being made to integrate traditional interventions along with standard of care. Though in the treatment the vitamins are must obtained through the diet as the immune boosters.

I. INTRODUCTION :

Currently entire world is experiencing the desolation and devastation of a deadly virus, new disease of COVID -19. . It had found its origin in Wuhan city of China. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the causative agent for the COVID-19. In India, its route starts with the first migrant come from Wuhan city of China was a medical student who was first identified patient of COVID-19. The government of India introduces to lockdown in the country from 17th March 2020. After that rapid increase in COVID-19 patients had been observed. Ministry of information and Broadcasting in July 2020 had declared that the mortality rate in India due to COVID-19 is lowest as compared to the rest of the world at 2.41%.

In India, the spread of the corona virus had been observed through peoples who had travel history to the affected countries in March. Then some peoples had also been attended the various functions that also leads to the rapid transmission of COVID-19 in India. The festive season and unlock in India again created second wave of

COVID-19. Immunity boosting is the only way to combat COVID-19 infection as it is most effective way for the treatment of COVID-19. As there is non-availability of any vaccines for the treatment of COVID-19. In the first wave of COVID-19 the treatment was vitamin tablets and immunity boosting food as the all the state governments provided to the quarantined hospitals.

II. VITAMINS USED IN TREATMENT OF COVID -19 :

1. **VITAMIN D :** Vitamin D is a fat-soluble nutrient essential to the health and functioning of your immune system. Vitamin D enhances the pathogen-fighting effects of monocytes and macrophages — white blood cells that are important parts of our immune defense and decreases inflammation, which helps promote immune response .Many people are deficient with this important vitamin, which may negatively affect immune function. In fact, low vitamin D levels are associated with an increased risk of upper respiratory tract infections, including influenza and allergic asthma . vitamin D may improve immune response. In fact, recent research suggests that taking this vitamin may protect against respiratory tract infection. Supplementing with VIT.D significantly decreased the risk of respiratory infections in people deficient in this vitamin and lowered infection risk in those with adequate vitamin D levels. This suggests an overall protective effect. Other studies note that vitamin D supplements may improve response to antiviral treatments in people with certain infections, including hepatitis C and HIV . Depending on blood levels, anywhere from 1,000 to 4,000 IU of supplemental vitamin D per day is sufficient for most people, though those with more serious deficiencies often require much higher doses .Vitamin D has been highly researched in connection with COVID-19 because of its effect on the immune system. Studies have shown that Vitamin D can expedite healing and stall inflammation in the respiratory system .many professionals within the health and science community argue that supplementing with Vitamin

D is generally safe and could possibly help protect individuals from the virus .



The patients hospitalized with COVID-19 who had sufficient levels of VITAMIN D had a decreased risk for adverse outcomes and death.

2.VITAMIN C : Vitamin c is a water – soluble vitamin that is thought to have beneficial effects in patients with severe and critical illness.It is an antioxidant and free radical scavenger that has anti-inflammatory properties influences cellular immunity and vascular integrity and serves as a cofactor in the generation of endogenous catecholamines because humans may require more vitamin C in states of oxidative stress vitamin C supplementation has been evaluated in numerous disease states including serious infections and sepsis Because SARS-CoV-2 infection may cause sepsis and acute respiratory distress syndrome (ARDS).

Administration of vitamin C to patients with pneumonia can decrease the severity and duration of disease.These includes its antioxidant,anti-inflammatory,antithrombotic and immuno-modulatory function.

Vitamin C causes a greater proliferation of natural killers without affecting their functionality Moreover the vitamin C reduces the production of ROS(reactive oxygen species) that contribute the activation of the inflammasome and in particular the NLRP3 that affects maturation and secretion of cytokines such as IL1 beta and IL-18 that are involved in the inflammatory systemic syndrome that characterized sepsis.Vitamin C blocks the expression of ICAM-1 and activation of NFκB that are involved in the inflammatory ,neoplastic,and apoptotic processes by the inhibition of TNF alpha .

For this reason, the use of vitamin C could be effective in terms of mortality and secondary outcomes in the cohort of patients with covid-19 pneumonia.Vitamin C supplementation is observed to reduce the length of ICU stay shorten the ventilation time in critical COVID-19 patients.Being water soluble and thus excreted within hours,dose frequency is important to maintain sufficient blood levels during active infection.



VITAMIN B : Vitamin B12 is one of the dietary requirements necessary in the treatment of corona virus patients. Cobalamin or vitamin B12 is one of the eight essential B group water-soluble vitamins,that helps to keep red blood cells oxygenated and prevents megaloblastic anaemia.

Vitamin B12 and TCS ,could alleviate severe systemic inflammation leading to ARDS following severe sepsis or septic shock can be summarized as follows: by selective inhibition of iNOS and reduction of excess NO,by decreasing RNS and ROS radicals,by sparing GSH,by stimulating oxidative phosphorylation ,coupled with the bacteriostatic role of TCS during phagocytosis.

Given its role as an antioxidant and an anti-inflammatory,B12 can protect against multiple organ dysfunction by modulating activity of certain cytokines ,growth factors and other substrates.It follows that high dose intravenous or intramuscular injections could be used in novel strategy against and ARDS in COVID-19 patients.

Vitamin B12 may regulate chemokine / cytokine formation and mediate the communication among immune cells.

Vitamin B9 (Folic acid ,folate) is essential for DNA an protein synthesis and plays a crucial role in the adaptive immune response.Folic acid inhibits the enzyme furin and blocks the binding of the SARS-CoV-2 spike protein,which makes it helpful in controlling respiratory disease in COVID-19.

Vitamin B6 (pyridoxine) influences innate / adaptive immunity and the proliferation of immune cells.Pyridoxine supplement relieves COVID-19 symptoms by reducing pro-inflammatory cytokines,improving immune responses,and preventing hypercoagulability.

Vitamin B3 (niacin (nicotinic acid ,pantothenic acid)has an anti-inflammatory impact ,and it can help reduce inflammation in patients with COVID-19 and can even be used as an adjunct therapy.

Vitamin B2 (riboflavin) is a neuroactive compound with immunomodulatory impressions and reduce pathogens in the blood of COVID -19 patients thus reducing transfusion-transmission risk in COVID-19.

Vitamin B1 thiamine is a co-enzymze that is important for the nervous and immune system functioning and has an anti-inflammatory effect,its deficiency affects the immune system leading to increased inflammation and oxidative stress.

Sufficient levels of thia,ine help build immunity against SARS-CoV-2 as it eliminates the SARS-CoV-2 virus by triggering humoral and cell –mediated immunity.



III. CONCLUSION :

Particular attention should be paid to the substances that play an important role in the regulation of the immune response, considering the possibility of reducing the risk of infection, and, at the same time, improving the health status of COVID-19 patients. The micronutrients with the strongest evidence for immune support are vitamins C, D, and B. To date, evidence has been published about the pivotal role of vitamin D: Its deficiency has been associated with increased susceptibility to respiratory infections. Considering that the main pathway of the SARS-CoV-2 infection is at the lung level, it is reasonable that the use of vitamin D supplements could improve the health status of COVID-19 patients, reducing the risk of infection for healthy individuals, helping COVID-19 survivors in the recovery of their lifestyle. In this way, it is important to consider supplementation in order to improve the recovery in the so-called COVID-19 survivors: With this definition we define a subject who has been

infected by the SARS-CoV-2 with a hospitalization period in the ICU, who is still living. The full recovery of COVID-19 survivors, or the implementation of their health status, represents a challenging research field for the scientific community in the near future.

Even if several measures such as the assumption of a specific diet regimen, the use of dietary supplements, and other similar interventions are promising for the prevention, management, and recovery of COVID-19 patients, it is important to highlight that strong data from randomized clinical trials are needed to support any such assumption.

IV. ACKNOWLEDGEMENT :

I Express my sincere thanks to DR.M.B.V Raju garu (principal) Avanthi Institute of pharmaceutical Sciences,Jawaharlal Nehru Technological University Kakinada and also thankful to my parents.

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