Advances in Bioresearch
Adv. Biores., Vol 11 (4) July 2020: 01-03

Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.11.4.13

Advances in Bioresearch

REVIEW ARTICLE

Role of Vitamins and nutrition in Pandemic CoVID-19 as immune modulator with future prospective

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ABSTRACT
The emergence and occurrence of outbreak caused by SARS-CoV-2 is mainly due to disruption of the host system by the Corona virus. The virus strain has been determined to disturb the system by evasion of the response once an individual is infected. Immunopathology studies of malady caused by SARS-CoV-2 still being investigated globally. However, with regard to the studies done to this pandemic, there are few of the mechanisms that justify the severity of the Infectious disease as association with Immunodeficiency. Studies shows that in CoVID -19 host Immune response is weaken by the virus(SARS-CoV-2).AT present, the management of infective agent Corona virus is important so as to limit the transmission of infection and it is required to strengthen the Immune system by various mean. Use of health fod and Anti oxidant like Vitamin D , C and E can help the body immune response against Virus. The Present Study discuss the role of these vitamin to for Host immune against SAR-COV 2
Keywords: COVID-19; SARS-CoV-2; 2019-nCoV; Zinc , Vitamin C ; Intervention, lipo-polysaccharide-stimulated cells

Received 12.04.2020 Revised 18.04.2020 Accepted 26.05.2020

How to cite this article:
Shimaa M Aboelnaga , S T Obeidat, S Pandey and F Khatoon. Role of Vitamins and nutrition in Pandemic CoVID-19 as immune modulator with future prospective. Adv. Biores., Vol 11 (4) July 2020: 01-03

INTRODUCTION

Certain Infection like corona virus may impairs the immune system, suppressing immune functions that are fundamental to host protection against pathogenic organisms. SAR-COV 2 infection like other viral agent damage Immunity [1].Impairment of immune function can be due to insufficient intakes of energy and macronutrients and/or due to decencies in specific micronutrients (vitamins and minerals). Often these occur in combination. Clearly the impact of deficiency of these Vitamins is greatest in developing countries, but it is also important in developed countries especially amongst the elderly, individuals with eating disorders, Individuals with Comorbidity , patients with certain allergy or Chronic diseases, and premature and small-for-gestational-age babies. Many studies of the interaction between nutrient availability and immune function have been performed in animals and these have often compared the effects of diets containing insufficient, sufficient and, in some cases, excess amounts of an individual nutrient under study. Such studies are valuable because they allow the effect.[2]
Identifying effective therapeutic regimen along with some antiviral trails and Vitamins are on clinical trial to combat the Corona epidemics. Current guidelines [3] recommend some Vitamins and antiviral therapies and oxygen inhalation and non pharmaceutical measures as supportive care for Pandemic Covid-19.[3]

EFFECT OF VITAMIN D3 SUPPLEMENTATION IN UPPER RESPIRATORY TRACT INFECTION

Vitamin D deficiency has been associated high susceptibility to Upper Respiratory Tract Infection. It has been shown by various studies that Impair absorption of Vitamin D has associated with low physical performance. There was a negative linear association between serum vitamin D levels and pulmonary infections in British adults [4], and vitamin D-deficient athletes were more likely to present URTI symptoms than optimal vitamin D groups [5]. It has been recognized that vitamin plays a vital role in

modulating and enhancing the innate immune functions and antibody production. Liuand colleagues reported that the activation of toll-like receptors was linked with vitamin D-mediated antimicrobial protein (AMP) production [4], and the concentration of AMPs, including secretory immunoglobulin A (SIgA) and plasma cathelicidin, was positively associated with vitamin D status in endurance sports athletes[12]. However, it is still debatable whether correcting vitamin D insufficiency reduces URTI and improves salivary immune functions. Recently, meta-analysis studies have found that vitamin D supplementation prevents the acute URTI [6], but the subjects in the selected studies were primarily children or patients. We believe that lack of studies with sports athletes may limit confirmation of the efficacy of vitamin D supplementation on URTI in the athletic communities. Previous studies have found that while 14 weeks of vitaminD3 supplementation improve the resistance to respiratory infections in athletes[7].

EFFECT OF VITAMIN E SUPPLEMENTATION ON HEALTH

Vitamin E. Vitamin E is one of the lipid-soluble antioxidant in the body and is required for protection of membrane lipids from peroxidation. Since free radicals and lipid peroxidation are immunosuppressive, it is considered that vitamin E should act to optimize and even 'enhance' the immune response [8]In laboratory animals, vitamin E deficiency decreased spleen lymphocyte proliferation, natural killer cell activity, specific antibody production following vaccination, and phagocytosis by Macrophages neutrophils [9] The effects of vitamin E deficiency are more marked if animals are fed a diet containing a high level of poly unsaturated fatty acids and raised LDL lipids .Vitamin E deficiency increases susceptibility of animals toward infectious pathogens like bacterial and viral agents [8]. Vitamin E supplementation of the diet of laboratory animals have increased antibody production, it help in lymphocyte proliferation, better performance of natural killer cell , and help macrophage to process of phagocytosis [9].Adding vitamin E to the diet of certain animal like mice increased lymphocyte proliferation, IL-2 production [10,11]. A raised level of vitamin E in the daily diet (500mg/kg food) also increased natural killer cell activity of spleen cells from old, but not young, mice [12]. Dietary vitamin E promotes their immunity and increase resistance to pathogens in chickens, turkeys, mice, pigs, house pets and cattle [10,11] Recent studies report improved immune cell functions and response in the animals receiving additional vitamin E [13]. Vitamin E prevented the retrovirus-induced decrease in production of IL-2 and interferon-g (IFN-g) by spleen lymphocytes and in natural killer cell activity in mice . In another study by Baker , Adult and old mice were fed diets containing adequate (30mg/kg diet) or high (500mg/kg diet) levels of vitamin E for 6 weeks and infected with influenza A virus. Young or old mice fed the high level of vitamin E had lower lung titres of virus than old mice fed the adequate vitamin E diet. The high level of vitamin E caused increased production of IL-2 and IFN-g by spleen lymphocytes from influenza-infected old mice [13]. These observations suggest that increasing vitamin E intake above habitual levels might enhance immune function and improve resistance and that vitamin E supplementation might be particularly beneficial in the elderly age.

ROLE OF VITAMIN ZINC SUPPLEMENTATION

Zn deficiency in human is associated with a wide range of immune impairments and Host response .Zn deficiency has a marked impact on bone marrow, decreasing the number of stem cells and the number and proportion of cells which are lymphoid precursors and germ cells [12]. In patients with Zn deficiency related to sickle cell disease, natural killer cell activity is reduced , but can be returned to normal by Zn supplementation and adding essential vitamins in their diets [13]. In acrodermatitis enteropathica, there is reduced level of serum zinc ,it is characterised by low intestinal Zn absorption, thymic atrophy, impaired lymphocyte development, decreased numbers of CD4þ cells and reduced lymphocyte responsiveness[14.15]. Moderate or mild Zn deficiency or in some clinical trials experimental Zn deficiency in man results in decreased thymulin activity and make them more susceptible for Infections , decreased Phagocytosis response and cell activity, and decreased lymphocyte proliferation, IL-2 production ,all can be link by Zn deficiency [16]. Experimental low serum Zn levels in man decreased IL-2, IFN-g and TNF-a production by mitogen-stimulated lymphocytes but did not affect IL-4, IL-6 or IL-10 production by these cells or IL-1b production by lipopolysaccharide-stimulated cells [17].

CONCLUSION

Vitamins are essential for healthy status and play crucial role for immunity Therefore it is needed to add these necessary vitamin in daily dietary habits, Use of these vitamin may play an supportive role for strengthen our immunity which help to Prevent individuals form Various infections and during out break of diseases like covid-19.

FUTURE PERSPECTIVES

There are many hurdles in designing a vaccine against CoVID-19 due to the reason that different age group and individuals with pre-existing immune status react differently to this disease because of their differences in immune responses, vaccine will not be enough to show proper pharmacokinetics but still research groups are indulged in screening vaccine Development. Due to the lack of many failed antiviral strategies in order to efficiently treat infections by coronavirus, scientists are trying to come up with preventive measure such as vaccination. This is possibly a positive outcome for the vaccine candidate for SARS-CoV-2 disease in the future.

ACKNOWLEDGMENTS AND DISCLOSURES

The authors are grateful to the Dr Fahmida and Dr Moonashaheen for encouraging this work. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed. There is a need to monitor the long-term impact of the virus exposure on the growth, development and other health measures. There is also an intense need to explore treatment options and vaccination for the effective control of coronavirus infection

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