Article: RT0267

How to cite this article?

Das and Kumar, 2020. Need for Promoting Vitamin C Rich Foods for Combating Detrimental Effects of COVID-19. Biotica Research Today 2(8): 742-744.

Biotica Research Today

Vol 2:8 742/744

2020

Need for Promoting Vitamin C Rich Foods for Combating Detrimental Effects of COVID-19

Rajeswari Das* and Mukesh Kumar

Dept. of Soil Science, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar (848 125), India

Open Access

Corresponding Author

Rajeswari Das

e-mail: das.rajeswari2008@gmail.com

Keywords

Ascorbic acid, COVID-19, Dietary source, Immunity

Abstract

As we know a strong immune system is something that acts as a barrier against any furious disease affecting human body. In the start of the year 2020, COVID 19 pandemic has created havoc in life and lifestyles of we humans mostly. As per our Ayurveda and scientific researches nutrition play a key role in building our immunity system. Among these essential nutrients there are few vitamins which add on to boost the defense system of our body. Vitamin C is none other than these essential vitamins whose main function is to boost the immune system via its various functions in human body. This article provides a general discussion on role of vitamin C dietary sources in boosting immunity and acting against COVID-19 corona virus infection.

Introduction

The novel corona virus disease (COVID-19) pandemic caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) has engulfed the world, affecting more than 180 countries. As a result, there has been considerable economic distress globally and a significant loss of life. Sadly, the vulnerable and immune-compromised in our societies seem to be more susceptible to severe COVID-19 complications (Wang *et al.,* 2020). Global public health bodies and governments have ignited strategies and issued advisories on various handwashing and hygiene guidelines, social distancing strategies, and, in the most extreme cases, some countries have adopted "stay in place" or lockdown protocols to prevent COVID-19 spread. Notably, there are several significant risk factors for severe COVID-19 infection. These include the presence of poor nutritional status and pre-existing noncommunicable disease such as diabetes mellitus, chronic lung diseases, cardiovascular diseases, obesity, and various other diseases that render the patient immune-compromised. These diseases are characterized by systemic inflammation, which may be a common feature of these noncommunicable diseases, affecting patient outcomes against COVID-19.

The recognition of vitamin C is associated with a history of an unrelenting search for the cause of the ancient haemorrhagic disease scurvy. Isolated in 1928, vitamin C is essential for the development and maintenance of connective tissues. It plays an important role in bone formation, wound healing and the maintenance of healthy gums. Vitamin C plays an important role in a number of metabolic functions including the activation of the B vitamin, folic acid, the conversion of cholesterol to bile acids and the conversion of the amino acid, tryptophan, to the neurotransmitter, serotonin. It is an antioxidant that protects body from free radical damage. It is used as therapeutic agent in many diseases and disorders.

Article History

Received in 04th August 2020

Received in revised form 07th August 2020

Accepted in final form 08th August 2020

E-mail: *bioticapublications@gmail.com*

Vitamin C protects the immune system, reduces the severity of allergic reactions and helps to fight off infections. Therefore, many times it has been debated to protect human being from the ferocious impact of COVID 19 but still there is controversy regarding its direct impact towards the disease.

Role of Vitamin C in Fighting Diseases: Controversy of Its Role against COVID 19

Vitamin C has been studied for many years and we know that it is an important co-factor involved in the formation of blood vessels, cartilage, muscle and collagen in bone and is vital for the healing process. As an anti-oxidant, the vitamin might help protect cells from damage by chemical free radicals. It is thought that these chemicals contribute to heart disease, cancer and other diseases. Possible beneficial effects attributed to vitamin C include reducing endothelial dysfunction, managing hypertension, reducing cardiovascular disease risk, and preventing stroke, certain types of cancer, diabetes, gout and possibly even Alzheimer's disease. The data on these possible uses is often controversial and/or conflicting and it is not entirely clear if benefits are at least partially the result of improved nutrition. Overall, regular use of vitamin C supplements shortens the duration of the common cold but does not reduce the risk of contracting a cold except in persons undergoing heavy physical stress (e.g. marathon runners, skiers, or soldiers in subarctic conditions) where the incidence of colds is cut in half. Taking vitamin C supplements once cold symptoms have already begun has no proven benefits. Rather than any direct effect on COVID-19 the antiviral effect is the reason why vitamin C has attracted interest as a possible treatment of COVID-19.

Vitamin C: Boosting Immune System

Vitamins are essential nutrients that are required for various biochemical and physiological processes in the body. It is well known that most of the vitamins cannot be synthesized in the body and hence their supplementation in diet is essential. Vitamins are classified on the basis of their solubility as water soluble (C and B complexes) and fat-soluble vitamins (A, D, E, K). Vitamin C or ascorbic acid (AA) was first isolated in 1923 by Hungarian biochemist and Nobel laureate Szent-Gyorgyi and synthesized by Howarth and Hirst. The body requires vitamin C for normal physiological functions. It helps in the synthesis and metabolism of tyrosine, folic acid and tryptophan, hydroxylation of glycine, proline, lysine carnitine and catecholamine (Strohle *et al.,* 2009). It facilitates the conversion of cholesterol into bile acids and hence lowers blood cholesterol levels. It also increases the absorption of iron in the gut by reducing ferric to ferrous state. As an antioxidant, it protects the body from various deleterious effects of free radicals, pollutants and toxins.

The human body doesn't have the capacity to generate Vitamin C. Therefore, it needs to be received through food and other supplements. Eat your fruits, you need to have enough vitamin C, we are sure most of you have seen your mothers chasing you with a bowl of fruits talking about how important this particular vitamin is in your growth and development. Vitamin C is one of the most important nutrients required by our body to carry out a variety of functions as shown in Figure 1. The human body doesn't have the capacity to generate Vitamin C. Therefore, it needs to be received through food and other supplements.

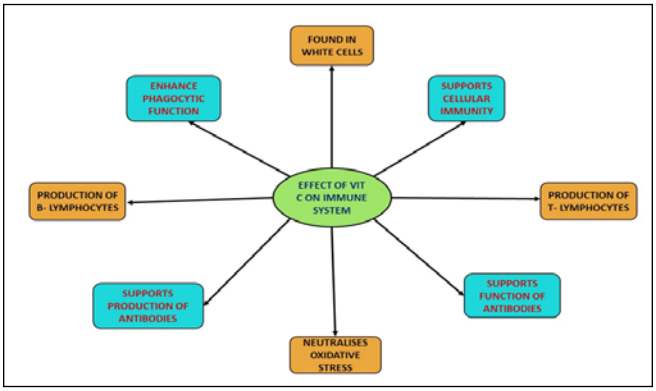

Figure 1: Various functions of Vitamin C inside human body which adds to a strong immunity system

Why Vitamin C?

Along with many benefits to human body as boosting immunity, fighting against free radicals and oxidative damage, keeping blood pressure levels in check, preventing cold and fever and helping in absorption of iron vitamin C prepares our body against any foreign invasion. Deficiency of this vitamin is often associated with anaemia, infections, bleeding gums, scurvy, poor wound healing, capillary haemorrhage, muscle degeneration, atherosclerotic plaques and neurotic disturbances. For the correction of deficiency, vitamin C is often supplemented in large doses and unlike fat soluble vitamins, toxicity is rare.

Dietary Source of Vitamin C

Vitamin C is found in citrus fruits, green peppers, red peppers, strawberries, tomatoes, broccoli, brussels sprouts, turnip, Indian gooseberry and other leafy vegetables. The animal sources are poor in vitamin C content and the level is usually <30–40 mg/100 g. Therefore plant sources become important because of high content of vitamin C up to 5,000 mg/100 g. It's absorption in the buccal cavity is by passive diffusion however in gastrointestinal tract absorption is by active sodium dependent vitamin C transporters.

The best source of vitamin C comes from fruits and vegetables. Eating a couple of citrus fruits every day will exceed your Recommended Dietary Allowance (RDA) for vitamin C or ascorbic acid. Citrus fruits such as orange, kiwi, lemon, guava,

grapefruit, and vegetables such as broccoli, cauliflower, Brussel sprouts and capsicums are rich, natural sources of vitamin C. Other vitamin C-rich fruits include papaya, cantaloupe and strawberries.

One cup of raw capsicums will provide 117 mg of vitamin C, which exceeds the RDA for both men and women. A combination of a kiwi fruit (75 mg of vitamin C) and a vegetable will provide all the vitamin C you need in a day.

Conclusion

To conclusively determine whether vitamin C therapy is beneficial for treatment of COVID-19 thorough study is needed. Of course, question will still remain whether more frequent intravenous dosing is effective or whether oral vitamin C should be given as a preventive measure for COVID-19 infection. Until then, individual need to make their own decisions based on available data and medical consultations. As with all medications, a key component of this decision will be an analysis of potential risk versus potential benefit.

References

Wang, L.S., Wang, Y.R., Ye, D.W., Liu, Q.Q., A review of the 2019 novel coronavirus (COVID-19) based oncurrent evidence. *Int. J. Antimicrob. Agents,* 2020, in press.

Strohle, A., Hahn, A., Vitamin C and Immunofunction. *Med Monatsschr Pharm*. 2009; 32(2): 49-56.