

Preventive Nutritional Style for New Type 2019 Coronavirus SARS-CoV-2 (COVID-19) Pandemic

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Article info

Review article

Received :19.09.2020
Received in revised form :16.11.2020
Accepted :19.11.2020
Available online :05.01.2021

Keywords

COVID-19
Coronavirus
Pandemic
Preventive
Nutrition

Abstract; The COVID-19 infection, which emerged at the beginning of 2020 and spread all over the world, led to the global pandemic. The destructive effects of the pandemic are tried to be stopped all over the world. In this process, scientific methods should be applied to combat the pandemic. Personal precautions are personal hygiene, apply social isolation and strengthen the immune system, support a natural, balanced, healthy diet, support nutrition with exercise and have a healthy lifestyle. Strong individual immunity is the main factor in avoiding virus infection or the severity of the infection. Social isolation advice has changed the lifestyle of some individuals and brought with a sedentary lifestyle and an irregular diet. As an expected result of this condition, the immune system has been weakened. Therefore, switching to a natural and balanced diet that will create a strong immune system will protect against the destructive effects of the new type of coronavirus pandemic. It is very important to supplement food containing vitamins, minerals, prebiotics and probiotics naturally with adequate water intake. Vitamin C, probiotics, prebiotics, thymoquinone, selenium and zinc supplements will strengthen the immune system, increase body resistance, thereby activating possible protective effects mechanisms for COVID-19 infection.

INTRODUCTION

Coronavirus pandemic has spread to the whole world, starting from the Far East countries at the end of 2019. Covid-19 infection effects the cytokines and chemokines levels. High cytokines and chemokines levels enhance the inflammation and cause organ and tissue failure. With a very rapid spread and destructive effect, the pandemic has been struggled against by many countries which have been affected by it. In this process, scientific methods should be applied to combat the pandemic. Personal precautions are personal hygiene, apply social isolation and strengthen the immune system, support a natural, balanced, healthy diet, support nutrition with exercise and have a healthy lifestyle. Strong individual immunity is the main factor in avoiding virus infection or the severity of the infection. Social isolation advice has changed the lifestyle of some individuals and brought with a sedentary lifestyle and an irregular diet. As an expected result of this condition, the immune system has been weakened. Therefore, switching to a natural and balanced diet that will create a strong immune system will protect against the destructive effects of the new type of corona virus pandemic. It is very important to

supplement food containing vitamins, minerals, prebiotics and probiotics naturally with adequate water intake¹⁻⁸. We aimed to give information about preventive nutritional style against coronavirus

Probiotics and prebiotics

The origin of the word probiotic is in Latin and it means life. Probiotics can be found more often in traditional and complementary medical advice. It is recommended to consume probiotics and prebiotics a lot for health. Fermented milk products are the most common way of consuming probiotics. There are some good bacteria in probiotic foods that are beneficial for digestion. Probiotics also have properties that reduce weight gain and prevent obesity. Food and drinks such as yoghurt, buttermilk, kefir, cheese, pickle, vinegar, boza, turnip produced by fermentation are very rich sources of probiotics. Probiotics are very valuable to keep the microbiota healthy and thus to have a strong immunity. However, in order to benefit from probiotics, prebiotics should be taken in nutrition. Strong prebiotic foods can be listed as onion, garlic, Jerusalem artichoke, leek, banana, apple, barley, oats, flaxseed

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and cocoa. To summarize, fruits, vegetables and cereals are powerful prebiotic foods. They are helpful in digestion thanks to their fibrous structure. Prebiotics that support probiotics and microbiota should be taken daily. In several studies, the efficacy of probiotics in viral infection treatments has been tried and proved. Probiotics reduce the severity of the disease in various viral infections, shorten the duration and help the symptoms improve quickly. Probiotic supplementation increases interferon, T lymphocyte and B lymphocyte levels in individuals who have an infection, thereby strengthening immunity⁹⁻¹². Probiotics fight with pathogens for food and stops their proliferation and interaction with the intestines. Probiotics induce intestinal epithelial cells by interacting to secrete IL-6. Furthermore probiotics improve IgA secretion in intestines and the other organs. In this way probiotics induce immune stimulation¹³.

Zinc

Zinc is the second most common trace element in the human body, after iron, which is considered essential, must be taken daily with nutrition for a healthy life. Zinc, which participates in the structure of many large molecules such as enzymes, hormones, proteins, etc., performs important functions. Zinc is involved in more than three hundred enzymatic reactions. Zinc has been shown to play a role in the immune-boosting and supportive system. Unhealthy nutrition plays an important role in zinc deficiency. Which nutrients contain what level of zinc has been determined by previous studies. In developing countries, zinc deficiency has been observed as a result of a high phytate protein based diet¹⁴⁻¹⁶. Zinc is very important for cell proliferation and effects congenital immunity and acquired immunity. In addition to taking part in cytosolic defense against oxidative stress, it takes part in the regulation of cytokine release and contributes to the continuation of mucosal membrane integrity¹⁷. Zinc has multiple antiviral effects in a lot of viral species including nidoviruses which coronavirus belongs to. This antiviral effects include effecting the immunity, cell membrane integrity which inhibits the entry of the virus and inhibiting RNA synthesizing activity of nidovirus (including coronavirus) by altering RNA-dependent RNA polymerase activity. Zinc also effects protein translation and protein processing¹⁸. Therefore, adequate zinc intake with nutrition is very important to strengthen immunity and support

health. Recommended daily zinc intake for adult men and women respectively; is 8 and 11 mg¹⁹.

Selenium

Selenium is a trace element necessary for making important antioxidant enzymes such as glutathione peroxidase. They also play an important role in the regulation and balance of the antioxidant system. Selenium helps to prevent free radical cell damage with its antioxidant feature. Trace elements including selenium, can modulate cell membrane permeability, regulate gene expression, participate in electron transport, and participate in the synthesis of hormones and vitamins²⁰⁻²³. Selenium deficiency is known to increase the severity and development of viral infections such as influenza, HIV, Coxsackie virus²⁴. Selenium supplementation has been shown to increase neutrophil function, antibody production, T and B lymphocyte proliferation, Natural Killer-mediated cell destruction, and lymphokine production²⁵. The decrease in cellular immunity due to aging can be reduced with Se support²⁶. Due to all these features, sufficient selenium should be taken within nutrition. In this way, it will be possible to strengthen the immune system. Recommended daily selenium intake for adults is 55 microgram¹⁹.

Thymoquinone

Thymoquinone is the most important bioactive component found in black seed (*Nigella sativa*) essential oil in the ratio of 18.4-24%. For this reason, thymoquinone can be considered as the main active ingredient of the black seed plant. *Nigella sativa* and isolated from black cumin seeds, thymoquinone has many beneficial effects such as being an antioxidant, antihyperlipidemic, antidiabetic, anti-inflammatory, gastroprotective and hepatoprotective. Researches on animals reveal that Thymoquinone has hypoglycemic, hypolipidemic and hypocholesterolemic effects²⁷⁻²⁹. Thymoquinone has been shown to regulate the production of antibodies. Thymoquinone has also been shown to support the cytotoxic activities of NK cells. Thymoquinone generates its immunomodulatory effects via the NF- κ B pathway. Thymoquinone has immune modulating functions in cellular and humoral immunity³⁰. Thanks to all these effects, consumption of thymoquinone is very important in strengthening immunity and protecting against infections

Vitamin C

Ascorbate is an antioxidant with no obvious toxic effects. Infectious diseases are often accompanied by oxidation, and infected individuals have a large amounts of free radicals. For this reason, ascorbate can both neutralize the abundant free radicals and reduce the tissue to the redox state of the patients. Vitamin C is very effective in reducing the redox environment due to the organism's strong response to oxidative stress, injury or damage during infection. A redox condition caused by vitamin C alters cellular signals caused by free radicals. Thanks to vitamin C, the immune response of the body is regulated correctly by preventing the shock situation that may occur due to infection and reducing the formation of inflammation. Previous studies have reported that high doses of vitamin C are effective against viral diseases. The antiviral capacity of vitamin C was thought to be proportional to the concentration and duration of treatment. Along with antiviral drug therapy, high doses of vitamin C have been reported to activate the body's immune and infection defense mechanisms. In other studies, inadequate vitamin C intake with foods has been shown to increase the mortality rate from infectious diseases. For all these reasons, it has been suggested to use vitamin C as an adjunct in treatment against a wide range of viral and bacterial diseases. High doses of vitamin C were recommended for many years, especially in all infectious diseases. Many scientific studies have shown that vitamin C has antiviral activity. This activity is directly proportional to the dose³¹⁻³⁸. Vitamin C decreases necrosis/NETosis by increasing apoptosis therefore it protects tissues against enhanced tissue damage³². Vitamin C provides resistance to infection with its high antioxidant and tissue integrity protective effects. There is a lot of data to think that vitamin C is protective and preventive for COVID-19 infection.

CONCLUSIONS

As a result, it can be thought that, considering our past researches and literature, vitamin C, probiotics, prebiotics, thymoquinone, selenium and zinc supplements will strengthen the immune system, increase body resistance, thereby activating possible protective effects mechanisms for COVID-19 infection. Evidence-based benefits should be demonstrated by testing the ideal mix ratio and scientific efficacy of the recommended food supplement for possible protective effect for COVID-19 infection with new projects and research. Vitamin C, probiotics, prebiotics, thymoquinone,

selenium and zinc components can all be taken with foods by naturally with a proper, balanced and healthy diet. If there are problems and deficiencies in this way, supplementation may be recommended with the indication to be placed by the physician. Thanks to the correct application of nutritional biochemistry information, preventive and protective effects can be achieved for various infections, including COVID-19.

Conflict of interest

The authors have no conflicts of interest to declare.

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