

The Role of Nutrition in the COVID-19 Pandemic



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Editorial

On March 11, 2020, the World Health Organization (WHO) announced that the COVID-19 outbreak can be characterized as a pandemic [1]. A disease caused by the SARS-CoV-2 that can spread from person to person, affecting primarily to older people, immunocompromised persons, individuals who have existing medical conditions such as heart or lung disease or diabetes, and undernutrition patients [2]. These characteristics are not specific to the Chinese population because they have been reported also in North American and European patients with COVID-19. Older age is associated with impaired nutritional status and sarcopenia, also high body mass index score appears to be related to a poor prognosis in comorbid patients with COVID-19. Albumin circulating levels should not be considered as a nutritional marker in patients with inflammatory response, but a low prealbumin level predicts progression to acute respiratory distress syndrome (ARDS) [3].

The disease primarily involves the respiratory tract but it may deteriorate to multi-organ failure and be fatal [3]. Nutritional status appears a relevant factor influencing the outcome of patients with COVID-19, but not much information has emerged so far on the impact of early nutritional support in patients with COVID-19. People with an adequate nutritional status, a right balance between macronutrients (Protein, lipids, and carbohydrates), showed a lower probability of developing a severe stage of this disease [4]. Besides, patients under a long hospitalization lapse can reduce their nutritional status until developing intra-hospital undernutrition.

For these reasons, nutrition and healthy food habits become a priority role at this time. Currently, there is not a vaccine for

COVID-19, and many treatment options have been testing in some countries. Neither food, nutrients nor supplements can prevent SARS-CoV-2 infection, therefore, nutritional advice is considered appropriate at this time. Many studies around the world statement that eating an adequate quantity of fruits and vegetables, as a font of vitamins, minerals, and bio-components with an antioxidant function is a very important nutritional recommendation because they can boost immune function [5].

The body requires optimal levels of micronutrients for effective immune function, with different requirements throughout every stage of life. It is well established that clinical micronutrient deficiencies adversely affect the immune system, predispose individuals to infections and increase the risk of morbidity and mortality associated with the disease. It has been established that immune system needs multiple micronutrients and other bio-active substances, including vitamins A, D, C, E, B6, and B12, folate, zinc, iron, copper, selenium, beta-carotene, polyphenols, and flavonoids, which play vital, often synergistic roles at every stage of the immune response. These diet components can increase the number of T-cell subsets, enhance lymphocyte response to mitogen, reducing concentrations of pro-inflammatory cytokines that produce the inflammation, increased interleukin-2 production and potentiated natural killer cell activity [6].

Beta-carotene can be found in carrot, papaya, mango, sweet potatoes, and green leafy vegetables. Vitamin C supports a reduction in the risk, severity, and duration of upper and lower respiratory tract infections, so requirements for vitamin C increase during infection. Daily intake is 40mg a day, but some researchers recommended intake of 1-2g during infections.

Natural sources of vitamin C include guava, red peppers, oranges, strawberries, broccoli, mangoes, lemons, and most fruits and vegetables. Also, foods that contain vitamin D include bluefish, liver, egg yolk, and enriched foods as milk, yogurt, and fruit juices. Daily supplementation of vitamin D (50 mg/day) reduces the risk of upper respiratory tract infections. Vegetable oils as soybean, sunflower, corn, wheat germ, and nuts, seeds, spinach, and broccoli, are the major dietary sources of Vitamin E. Finally, poultry, red meat, nuts, beans, and lentils are good sources of iron and zinc. Marginal zinc deficiency can impact immunity. Those deficient in zinc, particularly children, are prone to increase diarrheal and respiratory morbidity [7].

There is no evidence that fermented dairy products or supplements of probiotics, prebiotics or symbiotics can help, prevent or decrease the risk of infections in general. However, some studies identified microbial dysbiosis in several patients with COVID-19. Therefore, prebiotics or probiotics could prevent secondary infection by bacterial translocation, although the evidence is not enough to recommend its use [8].

There is no scientific evidence supporting the use of alternative remedies to prevent or cure the illness caused by COVID-19. On the other hand, recent evidence indicates that there is some evidence that supplementation with multiple micronutrients may modulate immune function and reduce the risk of infection. Micronutrients with the strongest evidence for immune support are vitamins C, zinc [9] and vitamin D [10]. Nevertheless, better design of clinical studies of micronutrients in different populations is required to substantiate the benefits of supplementation against COVID infection. Some of these trials are registered on the web: ClinicalTrials.gov

Another nutritional recommendation includes proper hydration, drinking enough water every day (near 8-10 cups/day). Water is fundamental because it transports nutrients and compounds in blood, regulates your body temperature, gets rid of waste, and lubricates and cushions joints [1]. Fats are another nutrient of interest, people should avoid processed meats, trans fats and prefer unsaturated fats (e.g. found in fish, avocado, nuts, olive oil, soy, canola, sunflower and corn oils), especially the Omega-3 fatty acids which support an effective immune system, including by helping to resolve inflammation [7].

In conclusion, nutrition plays a fundamental role in this SARS-CoV-2 pandemic. Keeping fresh foods that are good sources of immuno-supportive nutrients, planning times to eat, meals, portions and emphasize whole grains, fruits, and vegetables are the most functional and frequent nutritional advice around the world. Subjects with malnutrition should try to optimize their nutritional status, ideally by diet counseling from an experienced professional (Dietitians, clinical nutritionists or specialized physicians).

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