

Nut Consumption in the Time of COVID-19

PHD STUDENT INDIRA PAZ GRANIEL and PROF. JORDI SALAS-SALVADÓ

Human Nutrition Unit, Department of Biochemistry and Biotechnology, Hospital Universitari de Sant Joan de Reus, Faculty of Medicine and Health Sciences, IISPV, Institut d'Investigació Sanitària Pere Virgili, Universitat Rovira i Virgili, Reus (Spain). CIBER, Centro de Investigación Biomédica en Red Fisiopatología de la Obesidad y Nutrición, Institute of Health Carlos III, Madrid (Spain).



Prof. Jordi Salas-Salvadó

Thousands of years ago, Hippocrates said, "Let food be thy medicine and medicine be thy food", today in 2020, we are still a long way from knowing how food can improve our immune system.

In the last months, along with the COVID-19 worldwide epidemic, the interest in strategies to prevent the infection appeared immediately. Consequently, some media sources published recommendations in various fields, including diet, to prevent COVID-19 infection. Although there is not enough scientific evidence that only one food could help avoid infections in the respiratory system, neither for COVID-19 nor other viruses, suggestions on the consumption of specific foods were made.

Over the last few decades, researchers have explored the possible effects of physical activity, exercise, nutrition, psychological stress, and age on the immune response. Consequently, multiple possible mechanisms have been identified that can mediate the effect between lifestyle and the immune response to infection. Diet is one of the determinants of the immune response that acts through different mechanisms.

Some years ago the term "immuno-nutrition" was introduced in the scientific and clinical field, as a science whose objective was to study the modulation of either the immune system activity or modulation of the consequences of

activation of it, by nutrients or specific food items⁽¹⁾. It helped to give some clarity regarding diet and nutrient interventions, especially in the clinical field. In an illness situation, our immune system becomes activated, which often gives place to an inflammation process, in order to protect us from the invaders (virus, bacteria, chemicals, plant-pollen, etc.). During this process, oxidant molecules are also produced. Nutrients with antioxidant and anti-inflammatory properties may contribute to the body's antioxidant defenses and thereby limit the ability of oxidants, released during inflammation. Omega-3 fatty acids, minerals such as selenium and zinc, and vitamins A, B6, B12, C and D, are all nutrients with some of these properties.

Therefore, it is recognized that almost all nutrients in the diet play a crucial role in maintaining an "optimal" immune response^(2,3), some of them at a higher implication level⁽⁴⁾. It is also known that malnutrition is associated with a higher risk of illness, either a deficient or excessive intake may have negative consequences on immune status and susceptibility to a variety of pathogens⁽²⁾. For example, malnourished individuals may have an increased risk of infection. However, in relation to diet, as far as we know, there are few specific studies that have explored the association between a specific food group and the immune system. Also, few clinical trials demonstrate beneficial effects of a single food, or a food group, on the risk of infection or complications after infection and among these studies there are inconsistencies. Therefore, we do not have enough scientific evidence to give clear recommendations at population level.

It has been reported that a Western Diet combined with chronic overnutrition and a sedentary lifestyle may induce



a constant inflammation status⁽⁵⁾ with harmful effects on the organism. On the contrary, dietary patterns, such as the Mediterranean Diet based on the consumption of high amounts of vegetables, fruits, cereals, legumes, nuts, fish and the use of olive oil, had been negatively correlated with serum markers of inflammation⁽⁶⁾. This leads us to hypothesize, that diets may provide resources of biologically active substances with local and systemic effects on immune function.

Nuts, which are included in most of the healthy dietary patterns, are characterized by their high energy density as a result of their high lipid content (especially from unsaturated fatty acids). They also contain plant-protein and significant amounts of polyphenols, phytosterols, vegetable fiber, and micronutrients (folates, vitamin E, selenium, magnesium, among other minerals and vitamins)⁽⁷⁾ that may interact synergically to benefit our health. Almonds, walnuts, hazelnuts, cashews, pistachios, peanuts, Brazil nuts, macadamias, pine nuts and pecans, contain all these nutrients, therefore the consumption of this food group might help regulate immunologic and inflammatory responses⁽⁸⁾. Indeed, an in-vitro study reported that pistachio polyphenol extracts had an inhibitory effect of HSV-1 (Herpes simplex virus type 1) through the modulation of the expression of some of its proteins⁽⁹⁾. Unfortunately, no human studies have been conducted investigating the possible effects of nut consumption against viral or bacterial infection, nor on the potential complications of these infections.

“Due to a lack of scientific evidence, we cannot recommend nuts to prevent COVID-19 infection as has been stated in some media in the last months. However, nut consumption has especially been shown to have beneficial effects on the cardiovascular system.”

In large epidemiologic studies, the frequency of nut consumption was consistently related to lower rates of coronary heart disease, cardiovascular disease (CVD) and mortality, but also total death⁽¹⁰⁾. Additionally, in some studies the frequency of nut consumption has also been inversely related to sudden death, peripheral artery disease and arrhythmia. Nuts have also demonstrated potential beneficial effects on the function of vessels, in reducing postprandial glycaemia and insulin resistance when substituting bad carbohydrates, in reducing the risk of certain types of cancer, delaying the age-related cognitive decline, decreasing the risk of depression, and improving sperm motility and some parameters of fertility⁽¹¹⁾.

The exceptional COVID-19 pandemic makes us realize that the field of nutrition and its association with the immune system, especially regarding respiratory illnesses, has been barely explored. Previously, in 2015 the European Food Safety Authority (EFSA) Panel on Dietetic Products, Nutrition and Allergies made the claim for health research related to the immune system defense against pathogens in the respiratory tract⁽¹⁰⁾, but research on the subject has not advanced since then. Meanwhile, the recommendation to adhere to a healthy lifestyle (characterized by a healthy dietary pattern such as the Mediterranean Diet including nuts and physical activity practice) seems to be the best option to keep our immune system functioning well. ■

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