

COVID-19 PANDEMIC: WHAT ELSE CAN I DO?

PANDEMIA COVID-19: ¿QUÉ MÁS PUEDO HACER?

Lujhon G. Flórez G.^{1,2,a}

EDITORIAL

In these last weeks about by the COVID-19 pandemic, a phrase has become popular in Europe that, translated from its Italian antive says: ***“Remember that our grandparents were ordered to go to war; “all that is asked of us, is just to stay on the couch!”***

Although scientists from different countries and organizations are working rapidly to develop an effective vaccine and to have drugs that help treat this disease, until now the best thing to do to prevent the rapid spread of the virus is through measures hygienic and preventive distancing. However, many of us wonder what else we can do besides avoiding or delaying infection? Is it possible to improve our chances of successfully dealing with this disease?

Among the risk factors for having a worse prognosis in case of SARS-CoV-2 virus infection are the following: smoking, age over 60 years (due to the phenomenon known as immunosenescence⁽¹⁾), cardiovascular disease, diabetes, high blood pressure, lung diseases, cancer and obesity. It is also known that these mentioned diseases are related to each other because they share a common origin in metabolic disorders that underlie insulin resistance (Metabolic Syndrome). This resistance to the action of insulin has been identified as a conditioning factor of the immune response necessary to fight infections⁽⁴⁾.

Below, data are presented that show how some simple choices in our daily life, can help our body to be better prepared to resist or combat not only chronic diseases such as obesity, diabetes, cardiovascular disease, cancer, dementia, etc. but also to acute conditions like COVID-19:

Dietary decisions

Increasing the daily consumption of fruits and vegetables has been shown to induce benefit in different aspects of immune function such as:

- Proliferation of T lymphocytes and production of immunoreactive cytokines such as Interleukins 2 and 4^(5,6) with the intake of carotenoids and lycopenes, present in tomatoes, pink grapefruits, watermelons, plums, as well as in other fruits and vegetables of red or orange.
- Significant increase in the lytic activity of Natural Killer cells⁽⁷⁾ with the intake of polyphenols, which is abundantly present in multiple reddish fruits and vegetables, legumes such as lentils, beans, peas and soybeans, onions, garlic, peppers, tea and cocoa.
- Increase of more than 50% in the concentration of Immunoglobulin A, with the intake of mushrooms⁽⁸⁾, among other vegetables. Increased IgA secretion decreases the risk of developing viral respiratory infections.
- The consumption of cruciferous vegetables, such as broccoli, cabbage, and kale, facilitates the activation of intestinal lymphocytes, which in turn control the bacterial load and composition of the microbiota, relating our food intake to the activity of our immune system⁽⁹⁾.
- Increasing fiber intake by consuming fruits, vegetables, legumes and whole grains induces changes in

¹ Lifestyle Medicine Clinic, La Carlota Hospital, Montemorelos University, Mexico.

² Latin American Lifestyle Medicine Association.

^a MD, DipBLM.

Cite as: Lujhon G. Flórez G. COVID-19 pandemic: What else can I do?. Rev. Rev. Fac. Med. Hum. April 2020; 20(2):175-177. DOI 10.25176/RFMH.v20i2.2941

Journal home page: <http://revistas.urp.edu.pe/index.php/RFMH>

Article published by the Journal of the Faculty of Human Medicine of the Ricardo Palma University. It is an open access article, distributed under the terms of the Creative Commons License: Creative Commons Attribution 4.0 International, CC BY 4.0 (<https://creativecommons.org/licenses/by/4.0/>), which allows non-commercial use, distribution and reproduction in any medium, provided that the original work is duly cited. For commercial use, please contact magazine.medicina@urp.pe

the microbiota that favor multiple positive effects on the immune system⁽¹⁰⁾.

- It is recommended to avoid the consumption of carbohydrates and refined sugars, since they have been associated with a decrease in the response capacity of leukocytes, both in laboratory studies and in vivo studies, thus increasing the risk of developing infections^(11,12).

It is recommended to take for a varied diet, based on plants, with whole foods as little processed as possible, to achieve the known synergistic effects between different foods. This is much better than searching for "miracle effects" from specific nutrients⁽¹³⁾.

Physical activity

There is evidence showing that people who exercise regularly at a moderate intensity suffer from fewer infections than those who are sedentary⁽¹⁴⁾.

Regular exercise has been shown to have a favorable impact on the functioning of the immune system, even mitigating the effect of immunosenescence⁽¹⁵⁾, so that its practice is highly recommended in all age groups. It is necessary to clarify that high-performance physical activity is related to a decrease in immune function, so moderate-intensity exercise is recommended.

Sleep and Rest

Insufficient sleep increases the risk of developing infectious diseases, because it alters the immune system in different ways:

- Decreasing response to vaccines⁽¹⁶⁾.
- 300% increase in rhinovirus infection in people who sleep less than 7 hours compared to people who sleep more than 7 hours per night^(17,18).
- Lack of sleep decreases endogenous melatonin secretion which can have negative effects on the immune system. This is because melatonin can decrease inflammation and lung injury during viral infections⁽¹⁹⁾, in addition to being a stimulator of both innate and adaptive immunity⁽²⁰⁾.

It is recommended to sleep between 7 and 8 hours each night as one of the fundamental practices to be able to enjoy our good health.

Stress management

The negative effect of chronic stress on our immune system is known, in such a way that the tension added by the current situation can raise our cortisol

levels and decrease the capacity of our body to fight infections⁽²¹⁾. Although it is true that we cannot "erase" the uncertainty typical of times like those we are experiencing, we can control our response to stress. In addition to healthy eating, moderate physical activity, and adequate sleep, there are other measures that can be helpful such as meditation and breathing exercises.

Supplements

- **Vitamin D:** Has a regulatory effect on various components of the immune system. Furthermore, its deficiency has been related to an increased risk for the severity of SARS-CoV-2 infection, for this reason it has been proposed to evaluate and supplement vitamin D in people with an increased risk of contracting the infection or developing complications⁽²²⁾.
- **Vitamin C:** Clinical trials have shown that supplementation with Vitamin C can decrease the frequency, duration and severity of the common cold and the incidence of pneumonia⁽²³⁾. Furthermore, it is known that vitamin C can modulate the activation of one of the pathways involved in the "cytokine storm" involved in the severity of COVID-19 disease⁽²⁴⁾.
- **Zinc:** There is evidence that Zinc supplementation during the first 24 hours after the onset of cold symptoms can significantly shorten its duration⁽²⁵⁾, and it can also prevent the entry of coronavirus into cells and decrease their virulence^(26,27) (These effects have been studied in other coronaviruses than SARS-CoV-2). The use of nasal supplements of zinc is not recommended due to the risk of loss of smell, as well as prolonged supplementation with Zinc, due to its potential neurological adverse effects with prolonged use.

It is very interesting to see that factors such as diet, sleep, physical activity and how to deal with stress can condition the risk of contagion and, to a greater extent, the way our body copes with acute diseases such as infections. We hope this editorial can help people who are motivated by the current crisis want to improve their health. In addition to the "Preventive Measures of Contagion" that have been determined to contain the transmission of the virus, the affected healthy habits have a role at the level of each person, without falling into a feeling of false security.

Let us be agents of care: of ourselves, those around us and our environment.

Correspondence: Lujhon G. Flórez G.

Address: Calle, Fraccionamiento Camino al Vapor #209, Zambrano, 67512 Montemorelos, N.L., México.

Telephone: +52 826 263 3188

E-mail: lflorez@um.edu.mx

BIBLIOGRAPHIC REFERENCES

- Pawelec G. Age and immunity: What is "immunosenescence"? *Experimental Gerontology* 105 (2018) 4–9. DOI: 10.1016/j.exger.2017.10.024
- Reaven G.M. Role of Insulin Resistance in Human Disease. *Diabetes* (1988) Vol 37, 1595-1607. DOI: 10.2337/diab.37.12.1595
- Crofts C, Zinn C, Wheldon M, Schofield G. Hyperinsulinemia: A unifying theory of chronic disease? *Diabetes* (2015) 1 (4): 34-43. doi: 10.15562/diabetes.2015.19
- Tsai S, Clemente-Casares X, Zhou AC, Lei H, Ahn JJ, Chan YT et al. Insulin Receptor-Mediated Stimulation Boosts T Cell Immunity during Inflammation and Infection. *Cell Metab.* 2018 Dec 4;28(6):922-934.e4. doi: 10.1016/j.cmet.2018.08.003.
- Watzl B, Bub A, Brandstetter BR, Rechkemmer G. Modulation of human T-lymphocyte functions by the consumption of carotenoid-rich vegetables. *Br J Nutr.* 1999 Nov;82(5):383-9. DOI: 10.1017/s0007114599001634
- Watzl B, Bub A, Briviba K, Rechkemmer G. Supplementation of a low-carotenoid diet with tomato or carrot juice modulates immune functions in healthy men. *Ann Nutr Metab.* 2003;47(6):255-61. DOI: 10.1159/000072397
- Bub A, Watzl B, Blockhaus M, Briviba K, Liegibel U, Müller H et al. Fruit juice consumption modulates antioxidative status, immune status and DNA damage. *J Nutr Biochem.* 2003 Feb;14(2):90-8. DOI: 10.1016/s0955-2863(02)00255-3
- Jeong SC1, Koyyalamudi SR, Pang G. Dietary intake of *Agaricus bisporus* white button mushroom accelerates salivary immunoglobulin A secretion in healthy volunteers. *Nutrition.* 2012 May;28(5):527-31. doi: 10.1016/j.nut.2011.08.005.
- Li Y, Innocentin S, Withers DR, Roberts NA, Gallagher AR, Grigorieva EF et al. Exogenous Stimuli Maintain Intraepithelial Lymphocytes via Aryl Hydrocarbon Receptor Activation. *Cell* (2011) 147, 629–640. *Cell.* 2011 Oct 28;147(3):629-40. doi: 10.1016/j.cell.2011.09.025.
- Thaiss CA, Zmora N, Levy M, Elinav E. Diet, gut microbiota and immune responses. *Nature.* 2016 Jul 7;535(7610):65-74. doi: 10.1038/nature18847
- Sanchez A, Reeser JL, Lau HS, Yahiku PY, Willard RE, McMillan PJ, et al. Role of sugars in human neutrophilic phagocytosis. *Am J Clin Nutr.* 1973 Nov;26(11):1180-4. DOI: 10.1093/ajcn/26.11.1180
- Atamna A, Ayada G, Akirov A, Shochat T, Bishara J, Elis A. High blood glucose variability is associated with bacteremia and mortality in patients hospitalized with acute infection. *QJM.* 2019 Feb 1;112(2):101-106. doi: 10.1093/qjmed/hcy235
- Jacobs DR Jr, Gross MD, Tapsell LC. Food synergy: an operational concept for understanding nutrition. *Am J Clin Nutr.* 2009 May;89(5):1543S-1548S. doi: 10.3945/ajcn.2009.26736B.
- Campbell JP, Turner JE. Debunking the Myth of Exercise-Induced Immune Suppression: Redefining the Impact of Exercise on Immunological Health Across the Lifespan. *Front Immunol.* 2018 Apr 16;9:648. doi: 10.3389/fimmu.2018.00648.
- Duggal NA, Niemi G, Harridge SDR, Simpson RJ, Lord JM. Can physical activity ameliorate immunosenescence and thereby reduce age-related multi-morbidity?. *Nat Rev Immunol.* 2019 Sep;19(9):563-572. doi: 10.1038/s41577-019-0177-9.
- Taylor DJ, Kelly K, Kohut ML, Song KS. Is Insomnia a Risk Factor for Decreased Influenza Vaccine Response?. *Behav Sleep Med.* 2017 Jul-Aug;15(4):270-287. doi: 10.1080/15402002.2015.1126596.
- Cohen S, Doyle WJ, Alper CM, Janicki-Deverts D, Turner RB. Sleep Habits and Susceptibility to the Common Cold. *Arch Intern Med.* 2009 Jan 12;169(1):62-7. doi: 10.1001/archinternmed.2008.505.
- Prather AA, Janicki-Deverts D, Hall MH, Cohen S. Behaviorally assessed sleep and susceptibility to the common cold. *Sleep.* 2015 Sep 1;38(9):1353-9. doi: 10.5665/sleep.4968.
- Silvestri M1, Rossi GA. Melatonin: its possible role in the management of viral infections—a brief review. *Ital J Pediatr.* 2013 Oct 3;39:61. doi: 10.1186/1824-7288-39-61.
- Boga JA, Coto-Montes A, Rosales-Corral SA, Tan DX, Reiter RJ. Beneficial actions of melatonin in the management of viral infections: a new use for this "molecular handyman"? *Rev Med Virol.* 2012 Sep;22(5):323-38. doi: 10.1002/rmv.1714.
- Dahbhar FS. Enhancing versus suppressive effects of stress on immune function: Implications for immunoprotection versus immunopathology. *Allergy Asthma Clin Immunol.* 2008 Mar 15;4(1):2-11. doi: 10.1186/1710-1492-4-1-2.
- William B. Grant, Henry Lahore, Sharon L. McDonnell, Carole A. Baggerly, Christine B. French, Jennifer L. Aliano et al. Evidence that Vitamin D Supplementation Could Reduce Risk of Influenza and COVID-19 Infections and Deaths. *Nutrients* 2020, 12, 988; doi:10.3390/nu12040988.
- Hemila H., Vitamin C supplementation and respiratory infections: a systematic review. *Mil Med.* 2004 Nov;169(11):920-5. DOI: 10.7205/milmed.169.11.920.
- Choe JY, Kim SK. Quercetin and ascorbic acid suppress fructose-induced NLRP3 inflammasome activation by blocking intracellular shuttling of txnip in human macrophage cell lines. *Inflammation.* 2017 Jun;40(3):980-994. doi: 10.1007/s10753-017-0542-4.
- Hemilä H. Zinc lozenges and the common cold: a meta-analysis comparing zinc acetate and zinc gluconate, and the role of zinc dosage. *JRSM Open.* 2017 May 2;8(5):2054270417694291. doi: 10.1177/2054270417694291.
- Phillips JM, Gallagher T, Weiss SR. Neurovirulent murine coronavirus JHM. SD uses cellular zinc metalloproteases for virus entry and cell-cell fusion. *J Virol.* 2017 Mar 29;91(8). pii: e01564-16. doi: 10.1128/JVI.01564-16.
- Han YS, Chang GG, Juo CG, Lee HJ, Yeh SH, Hsu JT et al. Papain-like protease 2 (PLP2) from severe acute respiratory syndrome coronavirus (SARS-CoV): expression, purification, characterization, and inhibition. *Biochemistry.* 2005 Aug 2;44(30):10349-59. DOI: 10.1021/bi0504761