

Lifestyle4Covid: Exploratory Study among Infected Portuguesees

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On March 3rd, 2020, the Portuguese Health Minister published the 1st Covid-19 situation Report. At that time point, there were 4 confirmed cases and 101 suspected. Four months later, there were 43.569 confirmed cases, with 1605 deaths [1].

Comparing with Italy and Spain, the first wave of Sars-Cov-2 was smaller in Portugal. Possible explanation might arise from the timely and aggressive containment efforts, geographical location, low population density, especially in the countryside, and lower adherence and penetration of public transport systems.

The case-fatality ratio has however been similar to that of other countries and dominated by very old patients. National infographics data at the time of the production of this document, show that Covid-19 is more prevalent within the 40 to 49 age group [1], despite the volatile and rapidly evolving situation.

Earlier outbreaks such as the severe acute respiratory syndrome, the Middle East respiratory syndrome, and even the influenza pandemic made it clear that emergent transmittable agents still represent a continued and significant risk to human health. Furthermore, it was clearly demonstrated from the present outbreak, that our ability to detect and predict the initial emergence of a novel infectious agent, and our capacity to observe and project its transmission and spread among human populations, remains limited.

By now, Covid-19 still without specific treatment, and the WHO has organized the SOLIDARITY randomized trial, aiming to check the effectiveness of drugs that have been widely used to mitigate the effects of the disease, regardless of their side effects [2].

The role of a healthy lifestyle has been consistently and repeatedly emphasized in the fight against many noncommunicable diseases [3]. Conversely, the link between lifestyle and its effect on communicable disease is still far from being unveiled, and somewhat difficult to study and understand. In this sense, in less frequent situations, young and adult healthy patients, with an appropriate lifestyle profile, and without known diseases risk factors, suddenly develop a dangerous immune response to infections, called as cytokine storm, linked to very severe disease manifestation and possibly even death [4].

In this particular outbreak, a proper lifestyle has been advertised as a strategy to improve immune system and mental health [5], but there is still limited data on how pre infection lifestyle profile might hamper Covid-19 severity. Additionally, lifestyle is a multifactorial concept involving many behaviors that are difficult

to be precisely evaluated, representing an additional barrier in epidemiological studies. The available data about lifestyle risk factors and Covid-19 are mainly focused on tobacco use history [6] and obesity related to energy unbalance [7].

Tobacco is a risk factor for respiratory infections, such as colds, influenza, pneumonia and tuberculosis [8]. Corroborating this, seminal studies along this outbreak have been demonstrating that history of tobacco usage is linked to superior risk of pneumonia development [6], and eventually also mortality. Notwithstanding, evidence on links between tobacco consumption and Covid-19 prognostic are still lacking what might explain the reason why official reports do not present this particular factor as one of those related with higher mortality.

In the same direction, the few available epidemiological data from obesity and Covid-19 have highlighted that obesity-related conditions seem to worsen the infection. According to Centers for Disease Control and Prevention, patients with severe obesity have high risk for complications from Covid-19 [9], as well as obese patients with heart disease, diabetes, or fatty liver disease [7].

By definition, physical activity is any bodily movement produced from the skeleton muscles that results in energy expenditure. Physical activity is consistently shown to reduce the risk for developing systemic inflammation, excess body mass, non-communicable diseases, and premature mortality [10]. Health-related benefits provided by physical activity are dose-dependent [10], and probably mediated via a number of mechanisms, including the modulation of the immune system [11,12].

Despite the huge development in the past years in the field of exercise-induced positive immunology response [11,12], and the strong evidence on the beneficial effects of regular physical activity in all-cause mortality and in several health outcomes [10], there is still no research-based data on the direct effect of physical activity or exercise on COVID-19. The same is true for emergent lifestyle risk factors, such as sedentariness.

Considering the physiological plausibility of the immune system modulation in infectious diseases via lifestyle variables, we believe that the first important step would be to carry out descriptive epidemiological studies. Expected association results might be useful in terms of public health in order to develop strategies to promote a better health state, leading to better prognosis such lower severity and higher survival rates during outbreaks. In this sense, the LIFESTYLE4COVID project was

developed aiming to obtain descriptive epidemiological information about the pre-infection lifestyle characteristics of infected Covid-19 patients. Second, to observe possible associations between indicators of severity and duration of the disease with indicators of the pre-infection lifestyle. Third, to observe any changes in lifestyle after infection, despite the constraints of social isolation. For the purposes, physical activity, sleep quality, alcohol and tobacco consumption, along with Covid-19 severity and duration will be screened in pre and post infection moments in a representative Portuguese sample..

References

1. DGS. COVID-19 Relatório da Situação. 2020 [cited 2020 06 July]; Available from: <https://covid19.min-saude.pt/>.
2. WHO. "Solidarity" clinical trial for COVID-19 treatments. 2020 April 22th 2020]; Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/solidarity-clinical-trial-for-covid-19-treatments>.
3. WHO, Global status report on noncommunicable diseases. 2010: Geneve.
4. Licciardi F, Giani T, Baldini L, Favalli EG, Caporali R, et al. COVID-19 and what pediatric rheumatologists should know: a review from a highly affected country. *Pediatr Rheumatol Online J*. 2020; 18: 35.
5. WHO. Connecting the world to combat coronavirus / #HealthyAtHome. 2020; Available from: <https://www.who.int/news-room/campaigns/connecting-the-world-to-combat-coronavirus/healthyathome>.
6. Liu W, Tao ZW, Wang L, Yuan ML, Liu K, et al. Analysis of factors associated with disease outcomes in hospitalized patients with 2019 novel coronavirus disease. *Chin Med J (Engl)*. 2020; 133: 1032-1038.
7. Zheng KI, Gao F, et al., Obesity as a risk factor for greater severity of COVID-19 in patients with metabolic associated fatty liver disease. *Metabolism*. 2020; 154244.
8. National Center for Chronic Disease, P., S. Health Promotion Office on, and Health, Reports of the Surgeon General, in The Health Consequences of Smoking-50 Years of Progress: A Report of the Surgeon General. 2014, Centers for Disease Control and Prevention (US): Atlanta (GA).
9. CDC. Coronavirus Disease 2019 (COVID-19). 2020 April 24th 2020]; Available from: <https://www.cdc.gov/coronavirus/2019-nCoV/index.html>.
10. Ekelund, U., et al., Dose-response associations between accelerometry measured physical activity and sedentary time and all cause mortality: systematic review and harmonised meta-analysis. *Bmj*. 2019; 366: l4570.
11. Simpson RJ, Campbell JP, Gleeson M, Kruger K, Nieman DC, et al. Can exercise affect immune function to increase susceptibility to infection? *Exerc Immunol Rev*. 2020; 26: 8-22.
12. Walsh NP, Gleeson M, Shephard RJ, Gleeson M, Woods JA, et al. Position statement. Part one: Immune function and exercise. *Exerc Immunol Rev*. 2011; 17: 6-63.

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