JOURNAL OF MULTIPROFESSIONAL HEALTH RESEARCH

Severity on COVID-19 and systemic arterial hypertension: The new hypotheses

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Studies have shown that comorbidities, such as hypertension, have been frequently observed in patients infected with Covid-19 and have been associated with the increased risk of infection, severity of the disease and mortality [1]. It has been hypothesized that the use of drugs with upregulation effects on ACE2 could be aggravating this infection [1]. However, this hypothesis has not been confirmed in recent clinical studies (human) [2] and thus the pathophysiological mechanisms are still unclear.

This way we have hypothesized that the severe form of the Covid-19 infection on hypertensive patients can occur in another way. A classical study has shown hypertension increases the expression of ICAMs [3]. It is known that inflammation is inherent to the pathophysiological process of hypertension and it can lead to an endothelium activation, which is able to increase the release of molecules such as VEGF and ICAMs. These molecules can bind the spike proteins constituents of the virus, and this adhesion can increase the infection by Covid-19 (Figure 1) [4].

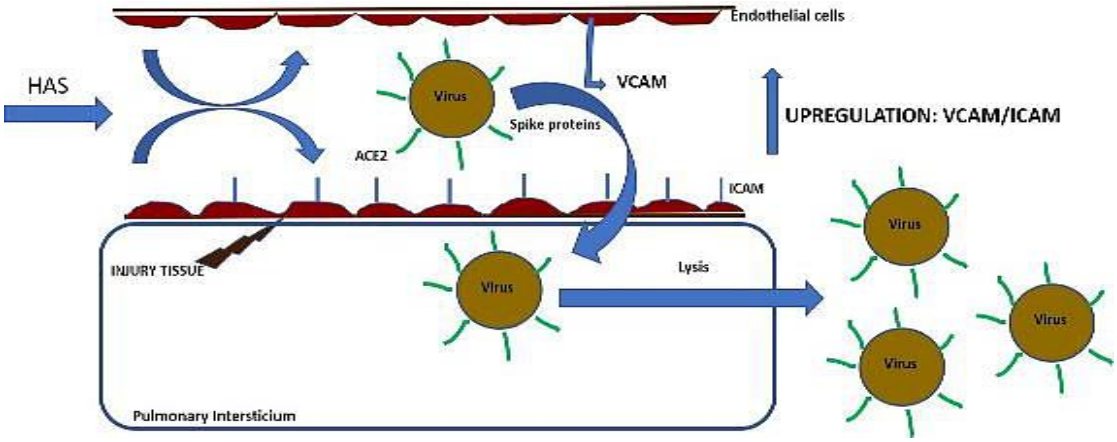

Figure 1. New hypothesis.
Source: The authors

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Received: Jan 11, 2021 Approved: Jan 12, 2021

Horby et al., 2020, has shown that to use dexamethasone decreased in 1/3 the mortality rate in patients with covid19 [5]. This reduction can be explained by the action mechanism of this drug that decreases the ICAMs expression. Moreover, the increased severity in other comorbidities such as: Diabetes, cardiovascular diseases and other inflammatory disorders can occur by increasing ICAMs also [6].

In this sense we have suggested that this inflammatory condition can be crucial in the development of the severe form of Covid-19 in hypertensive patients, so the use of inhibitors ACE and ABRs must be maintained in the infected patients. The use of anti-inflammatory drugs could be effective therapeutic agents in the clinical improvement of patients with this infection like the dexamethasone. Thus, this hypothesis could be testified by clinical trials in future studies.

REFERENCES

1. Fang, L, Karakiulakis, G, Roth, M. Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection?. The Lancet. Respiratory Medicine. 2020; 8(4): e21
2. de Abajo, FJ, Rodríguez-Martín, S, Lerma, V, Mejía-Abril, G, Aguilar, M, García-Luque, A, Elvira, C. Use of renin–angiotensin–aldosterone system inhibitors and risk of COVID-19 requiring admission to hospital: a case-population study. The Lancet. 2020.
3. Tadzic, R, Mihalj, M, Vcev, A, Ennen, J, Tadzic, A, Drenjancevic-Peric, I. The effects of arterial blood pressure reduction on endocan and soluble endothelial cell adhesion molecules (CAMs) and CAMs ligands expression in hypertensive patients on Ca-channel blocker therapy. Kidney and Blood Pressure Research. 2013; 37(2-3):103-15.
4. Noris, M, Benigni, A, Remuzzi, G. The case of Complement activation in COVID-19 multiorgan impact. Kidney International. 2020.
5. Horby, P, Lim, WS, Emberson, JR, Mafham, M, Bell, JL, Linsell, L, Landray, MJ. Dexamethasone in hospitalized patients with Covid-19-preliminary report. The New England journal of medicine. 2020.
6. Jilma, B, Blann, AD, Stohlawetz, P, Eichler, HG, Kautzky-Willer, A, Wagner, OF. Dexamethasone lowers circulating E-selectin and ICAM-1 in healthy men. Journal of Laboratory and Clinical Medicine. 2000; 135(3): 270-74.