Letter

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Facts and reflections on COVID-19 and anti-hypertensives drugs

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SUMMARY Based on some publications that associate SARS-CoV-2 infection with the use of anti-hypertensive drug groups such as angiotensin-converting-enzyme inhibitors (*e.g*. enalapril) or angiotensin II receptor blockers (*e.g*. losartan), many patients from South America, Central America or Spain, have stopped or intend to interrupt their treatments with these drugs. Hence, it may exist ominous consequences due to this drop out. For this reason, it is necessary to quickly warn about this situation and the risks associated with it.

Keywords SARS-CoV-2, COVID-19, Anti-hypertensive drugs, ACE, ATII-RB

We would like to contribute with some reflections regarding the association of SARS-CoV-2 infection, hypertension and antihypertensive drugs.

It is a fact that SARS-CoV-2 enters to the cells by the same route as the SARS-CoV that is, through a binding with the angiotensin II converting enzyme (ACE-II) (*1-4*). Cells with large amounts of ACE-II are present in the salivary glands of the mouth, along all the respiratory tract, epithelial cells of the lung, intestine, kidney, and blood vessels (*5*). ACE-II expression increases when patients are treated with drugs that inhibits this enzyme or with angiotensin II receptor blockers (ATII-RB) (*5*). This is due to the properties of both groups to significantly increase mRNA expression for ACE, increasing in this way the amount of enzyme available in the cells (*6*). Consequently, some authors hypothesize that ACE-II or ATII-RB groups, increasing the expression of ACE II in some cells (particularly alveoli) may rise the risk of infection with SARS-CoV-2 (*4-6*). Likewise, 2 studies in patients with confirmed coronavirus disease 2019 (COVID-19), showed that up to 30% of people affected had chronic arterial hypertension disease hypothesizing that hypertension may favor infection or aggravation of COVID-19 symptoms (*7-9*).

From these data we can conclude that there is a "potential/theoretical" risk that drugs from the ACE inhibitors group (such as enalapril, ramipril, captopril, and lisinopril) and ATII-RB (such as losartan, candesartan, valsartan, ibersartan, and telmisartan) may favor the internalization of COVID-19 inside the cell. However, we must recognize that the scientific foundation of this theory is very weak to date (*10*). About the reports associating hypertension with COVID-infection, it could be said that although 23 to 30% of the patients hospitalized because of the virus, had hypertension, it should be recognized that the prevalence of hypertension in adults is around that same percentage; so, this epidemiological association is clearly objectionable.

The abrupt drop-out of anti-hypertensive treatment could be associated with serious risks such as acute myocardial infarction (AMI), stroke and death from cardiovascular causes. So, withdraw of hypertension therapy, might cause even more morbidity and mortality than COVID-19 itself. If patients or their doctors wish to change ACEII-ATII-RB therapeutics, it would be time to remember that other anti-hypertensive groups like thiazide diuretics are a rational, effective, cheap and safe option.

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