Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Antihypertensive drugs and risk of COVID-19?

Lei Fang and colleagues[1] extrapolated results from a molecular study of coronaviruses, which showed that this group of viruses uses angiotensin-converting enzyme 2 (ACE2) to target cells on the epithelium of the lungs, intestine, kidneys, and blood vessels.[2] Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), would probably share these properties.

ACE2 is upregulated by antagonists along the renin–angiotensin system, such as angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs), which are common antihypertensive drugs used to treat patients with hypertension and diabetes. Whether an association exists between increased ACE2 expression and risk of infection with SARS-CoV-2 or severity of COVID-19 is currently not understood. Nevertheless, Fang and colleagues[1] suggested alternative treatment could be sought for those at high risk of infection, and broader public knowledge of this hypothesis has led to increasing uncertainty and concern.

Clinical societies have reinforced that there is currently not enough information to make recommendations and have reiterated that patients should not discontinue treatment. Regardless, many patients are seeking strategies to reduce their risk and might discontinue treatment with or without direction from their care providers. In response to this action, it is prudent to consider whether discontinuation of ACEIs and ARBs is safe in such patients and if alternative drugs are needed. This information is intended not to supersede clinical society statements but, rather, supply information in situations in which patients are adamant in their desire to discontinue ACEIs or ARBs.

Discontinuation of antihypertensive drugs in response to pathogens and pandemics has not been recorded in published work. Thus, a review of studies investigating general discontinuation of antihypertensive drugs is warranted, including results from population-based hypertension studies that include washout periods. Although specific antihypertensive agents were not reported in a cohort of patients with previous cardiovascular disease,[3] discontinuation of antihypertensive drugs was well tolerated. However, 14% (82 of 604) of patients in that study had side-effects and needed so-called escape treatment to avoid dangerous blood pressure levels (>180/110 mm Hg) or other disorders. Common adverse events associated with discontinuation include some cardiovascular side-effects, headache, anxiety, chest pain, dizziness, and malaise.[3,4] In a study in which ACEIs were discontinued,[5] the effect on blood pressure was paradoxical, with an immediate increase over 48 h and then a return to baseline or even lower levels. Long-term effects on blood pressure after discontinuation might depend on patient factors, and as far as we know no studies have assessed long-term outcomes.

Caution must be practiced when recommending discontinuation or alternative treatment. For patients on multidrug therapy, other antihypertensive agents might not be safe to discontinue and should be continued, particularly central-acting agents such as β-blockers and α2-agonists, which can have severe withdrawal syndromes. Second, if alternative agents are to be suggested, clinical guidelines for selection of these treatments should be followed.

I declare no competing interests.

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1 Fang L, Karakiulakis G, Roth M. Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection? *Lancet Respir Med* 2020; published online March 11. https://doi.org/10.1016/S2213-2600(20)30116-8.

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4 van der Wardt V, Harrison JK, Welsh T, Conroy S, Gladman J. Withdrawal of antihypertensive medication: a systematic review. *J Hypertens* 2017; **35:** 1742–49.

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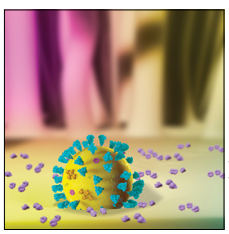
Related links

- The latest guidance from WHO on ibuprofen and COVID-19 (dated: 19.03.2020)
- Statement from Prof Michael Roth on how to interpret the original letter



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