Scientific statement of the Chinese Society of Cardiology (CSC) on using of renin angiotensin system blockers in patients with cardiovascular disease and COVID-19

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The coronavirus disease 2019 (COVID-19), which is caused by SARS-CoV-2, has become a worldwide public health crisis. Published clinical data from China and other countries have shown a much higher risk of developing COVID-19 and dying from the disease among the elderly, especially among those who had preexisting hypertension, cardiovascular diseases (CVD) and diabetes mellitus.[1]

Similar to SARS-COV-1, SARS-CoV-2 also belongs to beta-coronaviruses genera,[2,3] and both enter human cells through the angiotensin-converting-enzyme 2 (ACE-2) receptor.[4] ACE and ACE-2 are the two key regulatory enzymes that counter-balance each other in the renin-angiotensin system (RAS).[5,6]

Chinese physicians and scientists found that RAS played a significant role in the pathogenesis and pathophysiological development of COVID-19. A prospective observational study reported that 12 confirmed COVID-19 cases all developed pneumonia and half of them developed acute respiratory distress syndrome (ARDS). In addition, the angiotensin II level in the plasma sample from the COVID-19 patients was significantly elevated compared with healthy controls and linearly associated with viral load and lung injury.[7] It is suggested that SARS-CoV-2 might cause RAS over-activation to induce an inflammatory/cytokine storm, which leads rapidly to acute respiratory distress syndrome and even respiratory-circulatory failure.

Robust evidence from a lot of clinical studies has demonstrated that RAS inhibitors (ACE inhibitors (ACEI) and angiotensin receptor blockers (ARB)) are essential for controlling blood pressure and reducing the risks of adverse cardio- and cerebro-vascular and renal outcome events to improve the prognosis of patients with hypertension, diabetes, CVD as well as chronic kidney disease. Yet, there are minimal clinical studies with enough sample size that showed clear effects of ACEI or ARB on lung injury in patients with 2019-nCoV-2 infection. Recently, Chinese scholars reported the clinical characteristics and outcomes of 112 patients with COVID-19 infection and preexisting cardiovascular disease,[8] and found no significant differences in the proportion of patients using ACEI/ARB, neither between the serious and normal patient groups, nor between the death and recovery groups. It suggested that in patients with CVD, ACEI/ARB would not increase the incidence and mortality of COVID-19.

Recently, European Society of Cardiology, European Society of Hypertension, Heart Failure Society of American/American College of Cardiology/American Heart Association and International Society of Hypertension have issued statements respectively,[9–12] which expressed consistently that there is no clinical or scientific evidence to support the change or discontinuation of the use of ACEI/ARB in patients with COVID-19.

Therefore, the Chinese Society of Cardiology issued the statement with prudence and carefulness in clinical practice for patients with CVD (including hypertension, coronary heart disease, heart failure, etc.) and diabetes or kidney disease:
(1) Those who are not infected with SARS-CoV-2 should continue taking the previously effective ACEI/ARB.
(2) Those who are infected with SARS-CoV-2, even those with moderate pneumonia should continue taking ACEI/ARB.
(3) Regardless of whether the SARS-CoV-2 infection is confirmed, if there is an overt change in blood pressure or CVD symptoms, the patients should immediately see his physician or consult a cardiologist and then adjust the rele-
vant medications or dosage according to medical doctor’s advice.

(4) For COVID-19 patients with severe pneumonia, respiratory support, anti-infection, maintaining hemodynamics should be well implemented, meanwhile the use of ACEI/ARB should be individualized according to the disease status.

(5) COVID-19 patients should be managed based on evidence-based medicine in routine clinical practice. Further studies are necessary to explore the effects of RAS inhibitors on the COVID-19.

References

1. Shi HZ, Ma P, Gao FY, et al. [2019 novel coronavirus, angiotensin converting enzyme 2 and cardiovascular drugs]. Zhonghua Xin Xue Guan Bing Za Zhi. Published Online First: March 13, 2020. DOI: 10.3760/cma.j.cn112148-20200308-00171. [In Chinese].

2. Wu F, Zhao S, Yu B, et al. A new coronavirus associated with human respiratory disease in China. Nature 2020; 579: 265–269.

3. Zhou P, Yang XL, Wang XG, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature 2020; 579: 270–273.

4. Letko M, Marzi A, Munster V. Functional assessment of cell entry and receptor usage for SARS-CoV-2 and other lineage B betacoronaviruses. Nat Microbiol 2020; 5: 562–569.

5. Yang JM, Meng X, Xue F, et al. [ACE2 in the context of 2019-nCoV infection: friend or foe?]. Zhonghua Xin Xue Guan Bing Za Zhi. Published Online First: March 19, 2020. DOI: 10.3760/cma.j.cn112148-20200303-00149. [In Chinese].

6. Hou P, Xu Q, Na J, et al. [Angiotensin-converting enzyme 2 and coronavirus: research update on pathogenesis of the infection induced by this indissoluble bond]. Zhonghua Xin Xue Guan Bing Za Zhi. Published Online First: March 11, 2020. DOI: 10.3760/cma.j.cn112148-20200224-00121. [In Chinese].

7. Liu Y, Yang Y, Zhang C, et al. Clinical and biochemical indexes from 2019-nCoV infected patients linked to viral loads and lung injury. Sci China Life Sci 2020; 63: 364–374.

8. Peng YD, Meng K, Guan HQ, et al. [Clinical characteristics and outcomes of 112 cardiovascular disease patients infected by 2019-nCoV]. Zhonghua Xin Xue Guan Bing Za Zhi. Published Online First: March 2, 2020. DOI: 10.3760/cma.j.cn112148-20200220-00105. [In Chinese].

9. European Society of Cardiology. Position statement of the ESC Council on Hypertension on ACE-inhibitors and angiotensin receptor blockers. European Society of Cardiology Council on Hypertension of news Web site. https://www.es-cardio.org/Councils/Council-on-Hypertension-(CHT)/News/position-statement-of-the-esc-council-on-hypertension-on-ace-inhibitors-and-ang (accessed March 13, 2020).

10. European Society of Hypertension. Statement of the European Society of Hypertension (ESH) on hypertension, Renin Angiotensin System blockers and COVID-19. European Society of Hypertension Statement on COVID-19 Web site. https://www.eshonline.org/spotlights/esh-statement-covid-19/ (accessed April 15, 2020).

11. American College of Cardiology. HFSA/ACC/AHA statement addresses concerns reusing RAAS antagonists in COVID-19. Latest in cardiology Web site. https://www.acc.org/latest-in-cardiology/articles/2020/03/17/08/59/hfsa-acc-aha-statement-addresses-concerns-re-using-raas-antagonists-in-covid-19 (accessed March 17, 2020).

12. International Society of Hypertension. A statement from the International Society of Hypertension on COVID-19. International Society of Hypertension of news Web site. https://ish-world.com/news/a/A-statement-from-the-International-Society-of-Hypertension-on-COVID-19/ (accessed March 16, 2020).