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LETTER TO THE EDITOR

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Comment on "Organ-protective effect of angiotensin-converting enzyme 2 and its effect on the prognosis of COVID-19"

Dear Editor,

I read with this informative review article by Cheng et al "Organ-protective effect of angiotensin-converting enzyme 2 (ACE2) and its effect on the prognosis of COVID-19." They mentioned that the protective effect of ACE2 on heart and lung. However, it is still under discussion whether the COVID-19 patients could be beneficial from a high level of ACE2 expression. Furthermore, it is still unclear whether hypertension-linked COVD-19 patients should continue to take ACEI/ARBs. Here, I would like to talk about the role of ACE2 concerning endothelial cell function. Besides, I would like to mention that COVID-19 patients might benefit from ACEI/ARBs concerning improving endothelial dysfunction in COVID-19.

It is well studied that SARS-CoV-2 infects the host by binding ACE2 receptor,[1] which is widely expressed in endothelial cells.[1] The evidence was further shown that endothelial cells were infected by the virus leading to endothelial dysfunction in COVID-19 patients.[2] Therefore, improving endothelial function may open a new therapeutic avenue in COVID-19 patients.

It is well established that Angiotensin II (ANG II) is one of the main effectors of endothelial dysfunction and is mainly regulated by the renin-angiotensin system (RAS)[3]

ACE2 played as a negative regulator of the RAS, which promotes the degradation of ANG II and maintains endothelium homeostasis.[1] Several studies have shown overexpression of ACE2 could improve endothelial repair and regeneration.[3,4] In addition, virus-induced ACE2 abscission and a decrease in the level of ACE2 contribute to developing pulmonary edema and acute respiratory distress syndrome.[5] Taken together, above studies indicate that the approaches to increase ACE2 may provide effective therapy for improving endothelial dysfunction in COVID-19.

Regarding whether COVID-19 patients with hypertension should continue to take ACEI/ARBs. On the one hand, studies have shown ACEI/ARBs increase ACE2 level,[6] which protects heart and lung functions.[1] Furthermore, animal and human studies confirm that the beneficial effects of ACEI in reversing endothelial dysfunction.[7] On the other hand, regarding the concerning that the high level of ACE2 expression might facilitate infection with COVID-19, there is no direct evidence shown that ACE2 level is positively correlated with the infection risk. Several studies reported that COVID-19 related mortality was higher in men and the elderly than women and the young, but the level of ACE2 was shown oppositely.[6,8] Moreover, Zhang et al[9] have reported that ACEI/ARB was associated with lower mortality in COVID-19 patients with hypertension. In conclusion, COVID-19 patients with hypertension may benefit from ACEI/ARBs by increasing ACE2 and improving endothelial functions. Besides, other antihypertension drugs, such as amiloride, might be used to treat hypertension-linked COVID, which has shown improved endothelial functions.[6,10]

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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