DO Angiotensin Receptor Blockers (ARBs) reduce severity of pneumonia in 2019-nCov course of illness and improve survival?

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Abstract:

Cases of pneumonia of unknown etiology detected in Wuhan City, Hubei Province of China had been reported to World Health Organization (WHO) on 31 December 2019. A novel coronavirus (2019-nCov) was identified and isolated by Chinese health authorities on 7 January 2020, and it was reported to share the same receptor, Angiotensin-converting enzyme 2 (ACE2) as SARS-CoV do, ACE2 RNA expression profile in the normal human lung and ACE2 virus receptor expression is concentrated in a small population of type II alveolar cells, recalling lessons from SARS, we can postulate that the use of ARBs empirically for patient infected with 2019-nCoV will stimulate AT2 receptor, and at the same time the free Angiotensin II can compete to the viral receptor site, therefore, we will promisingly noticed reduce in pneumonia severity, increase the recovery rate and improve overall survival**.**

Key words: 2019-nCov**,** AT2 receptor**,** Wuhan City**.**

Introduction:

Cases of pneumonia of unknown etiology detected in Wuhan City, Hubei Province of China had been reported to World Health Organization (WHO) on 31 December 2019. A novel coronavirus (2019-nCov) was identified and isolated by Chinese health authorities on 7 January 2020, and it was reported to share the same receptor, Angiotensin-converting enzyme 2 (ACE2), with SARS-Cov (Zhao, Zhao et al. 2020). A study reporting that ACE2 and the angiotensin II type 2 receptor (AT2) protect mice from severe acute lung injury induced by acid aspiration or sepsis. However, other components of the renin-angiotensin system, including ACE, angiotensin II and the angiotensin II type 1a receptor (AT1a), promote disease pathogenesis, induce lung oedemas and impair lung function(Imai, Kuba et al. 2005). The AT2-receptor belongs to the family of seven-transmembrane domain receptors that spanning the cell membrane with both intracellular and extracellular loops (Unger and Sandmann 2000). A preprint study not certified by peer review, analyzed the ACE2 RNA expression profile in the normal human lung and they reported that the ACE2 virus receptor expression is concentrated in a small population of type II alveolar cells (AT2)(Zhao, Zhao et al. 2020).

Interestingly, “when the AT1 receptor is blocked, local free Ang II levels will rise, leading to increased concentration of Ang II around the AT2 receptors and to concomitant greater stimulation” this phenomenon was termed yin–yang effect (Siragy 2002). The AT2-receptor seems to have a role in apoptosis, embryonal development, and neuronal regeneration of tissues after injury, in angiogenesis, cellular differentiation, growth inhibition and possibly vasodilatation (Unger and Sandmann 2000). Moreover,

studies during SARS outbreak have demonstrated that ACE2 protects murine lungs from acute lung injury as well as SARS-Spike protein-mediated lung injury, suggesting a dual role of ACE2 in SARS infections and protection from Acute Respiratory Distress Syndrome ARDS (Imai, Kuba et al. 2007). A case control study among ARDS found that the RAS inhibitor group showed better survival rates than the non-RAS group ($P < 0.001$), and this study concluding that ACE inhibitor or ARB may have beneficial effect on ARDS patients (Kim, Choi et al. 2017).

Conclusion:

Taking in the consideration that AT2 receptor is highly expressed in Asian comparing to other ethnic group, we can conclude that the use of ARBs empirically for patient infected with 2019-nCoV will stimulate AT2 receptor, and at the same time the free Angiotensin II can compete to the viral receptor site, therefore, we will promisingly noticed reduce in pneumonia severity, increase the recovery rate and improve overall survival.

Recommendation:

1. Empirical use of one ARBs along with evidently confirmed measures can improve the survival rate of 2019-nCoV.
2. Retrospective cohort study can be conducted to pick-up the effect of ARBs on the survival rate among 2019-nCoV who using those drug for other condition before the course of illness.

Acknowledgement:

I would like to acknowledge and appreciate the effort of Dr. John Campbell and Dr. Roger Seheult for their thoroughly updates on 2019-CoV through social media that encouraged me to write this short communication.

Conflict of interest:

Author declares that there is no conflict of interest.

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