Gender related of acute kidney injury in COVID-19 patients

Dear Editor,

The coronavirus disease 2019 (COVID-19) is well recognized as a global pandemic worldwide. Besides the significant prevalence of pneumonia and acute respiratory distress syndrome (ARDS), acute or chronic kidney diseases are subject of debate in patients with COVID-19. The 0.5%, 4.3%, 4.5%, 7%, 10.5%, 23%, or 34.6% prevalence of acute or chronic kidney diseases among the patients with COVID-19 were reported.[1-5] The major cause of acute kidney injury (AKI) was related to cytokine damage or organ cross-talk between the pulmonary and renal system and cardio-renal syndrome in COVID-19 patients.[1] Abnormal urine dipstick test or AKI were also detected in 75.4% of 333 patients with COVID-19.[3] The kidney histopathological investigation in 26 patients with COVID-19 showed the existence of proximal tubule injury with loss of brush border.[5] It seems that the cytokine storm induced tubular injury, cytopathic effect of virus, angiotensin-converting enzyme-2 (ACE2) expression effect on podocytes and tubular epithelial cell or viral tropism are the main important factors in the pathophysiology of AKI associated with COVID-19.[6] Generally, there is an association between ARDS and AKI, and the prevalence of AKI compared to ARDS is low. However, the occurrence of AKI in ARDS patients with COVID-19 must be monitored seriously for hospitalized patients to reduce the mortality rate during the COVID-19 crisis. In addition, the use of ACE inhibitors or angiotensin-receptor blockers may worse infection in COVID-19 patients, and the control of ACE2 is suggested.

Now, one question needs to be considered here. Does AKI in patient with COVID-19 occurs gender dependently or not? It is documented that cytokine storm is gender related,[7] and a higher ACE2 expression[8] was detected in old female rats than male and it contributes in SARS attacks. Increased ACE2 activity in male animals compare to females also is existed.[9] Although the existence of an equal prevalence of COVID-19 between males and females, however, the mortality rate in males is higher than females.[10] The activity of renin-angiotensin system (RAS) is gender related, while a lower level of angiotensin II type 2 receptor was detected in male, and the kidney injury also was altered by gender.[11] Collectively, it may be concluded that the AKI in COVID-19 patients is gender related, and the exact mechanisms should be determined. However, the gender dependence of ACE2 expression, RAS activity, and cytokine storm are good early reasons to accept the gender related of COVID-19 as well as AKI in COVID-19 patients.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Mehdi Nematbakhsh
Water and Electrolytes Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

Address for correspondence: Prof. Mehdi Nematbakhsh, Water and Electrolytes Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.
E-mail: nematbakhsh@med.mui.ac.ir

Submitted: 31-Aug-2020; **Revised:** 08-Sep-2020;
Accepted: 21-Sep-2020; **Published:** 30-Aug-2021

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Quick Response Code:

Website: www.jmsjournal.net

DOI: 10.4103/jrms.JRMS_1034_20

How to cite this article: Nematbakhsh M. Gender related of acute kidney injury in COVID-19 patients. J Res Med Sci 2021;26:64.