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Use of Spironolactone in SARS-CoV-2 ARDS Patients

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Dear Editor,

Since the end of 2019, a pandemic has emerged and spread around the globe with patients presenting with acute respiratory failure. The causative agent was defined as a novel coronavirus, hence Severe Acute Respiratory Coronavirus 2 (SARS-CoV-2), which has similar genetic properties compared with the previous outbreaks seen in the last two decades. It has affected more than a million patients and results in increased mortality, especially in elderly patients (1).

SARS-CoV-2 disturbs the mechanism of the renin-angiotensin-aldosterone (RAAS) system. RAAS is essential in regulating blood pressure, homeostasis and the electrolyte balance. SARS-CoV-2 enters the host cell, i.e. Type II pneumocytes, via an interaction between its spike proteins and Angiontensin Converting Enzyme II (ACE II) receptors. As a consequence these receptors downregulate, leading to disinhibition of Angiotensin Converting Enzyme I on the angiotensin II. Angiotensin II (AT-II) has a myriad of effects, both regional and systemic. A relative increase in the alveolar AT-II levels leads to pulmonary vasoconstriction, increase in capillary permeability, enhanced fibrosis and eventually cytokine storm. Also, it is a robust systemic vasoconstrictor and the primary inducer of aldosterone production (2).

In addition to hypoxemia, hypernatremia and hypokalaemia are also common in SARS-CoV-2 ARDS (3, 4). It is possible that the pathogenesis of the virus and the subsequent secondary hyperaldosteronism caused by increased AT-II levels might be responsible for the outcome (5, 6).

Spironolactone is an aldosterone antagonist which also has anti-inflammatory properties, and it is widely used in cardiac diseases (7, 8). In SARS-CoV-2 patients, diuretics like furosemide may have little value because of the profound electrolyte imbalance. On the other hand, spironolactone reverses this imbalance (9).

In addition to proning, use of neuromuscular blocking agents and a restrictive fluid policy, we opted for administration of spironolactone and observed an improvement in terms of oxygenation. A randomised controlled trial is on the way (NCT04345887) and we believe we may have an answer to this issue in close proximity.

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