COVID-19 Kidney Damage: A Possible Tangle

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Everyone is talking about coronavirus disease 2019 (Covid-2019). It also known as novel coronavirus (CoV) named '2019-nCoV' or '2019 novel coronavirus' or 'COVID-19' by the World Health Organization (WHO).[1] There is a lot of information everywhere about this virus and how to protect oneself from it. Our recent health care system as well as health care professionals has been facing challenges due to this infectious virus.

Primarily the virus enters into the body through the nose, eyes, mouth and move into the lungs, where the most severe illness occurs. The virus replicates in cells, including the blood, and changes the blood's environment by disrupting the normal level of essential elements like oxygen, nitrogen, iron, and others essential for normal body function.[2]

This change negatively affect the body's ability to transfer oxygen from the lungs into the bloodstream and then into other organs. This can result in harming various organs like the kidneys, heart, gut, and pancreas.

Complications due to COVID-19

- Pneumonia
- Acute liver injury
- Acute respiratory failure
- Acute cardiac failure
- Acute kidney injury
- Secondary infection
- Septic shock [3]

The kidneys are the most important organs in Human Body. They remove wastes from the body, maintain balanced electrolyte levels and blood pressure, Secretion of active compounds (Erythropoietin, Renin, Calcitrol).[4]

Kidney involvement is frequent in COVID-19 with clinical expression from mild proteinuria to acute kidney injury (AKI) and finally renal replacement therapy (RRT).[6] Kidney cells have ubiquitous angiotensin-converting enzyme (ACE)-2 receptors in the proximal tubules and glomeruli that enable the new coronavirus to attach to them, invade, and make copies of itself, potentially damaging those tissues. These ACE-2 receptors expressed more in the kidney than in other organs (lung, heart, intestine, and endothelial cells).[5]

The Cytokine storms, which are produced in the host body that react to the infection, may also be responsible for renal damage. When that happens, the immune system sends a rush of cytokines into the body which can cause severe inflammation. This inflammatory reaction can destroy healthy tissue, including that of the kidneys.[6] Viruses can cause tiny clots to form in the bloodstream, which can clog the smallest blood vessels in the kidney and impair its function. It is common in COVID-19 patients facing Proteinuria, hematuria, and elevated blood urea nitrogen and elevated creatinine.[7] In a histopathological study, twenty six (26) deceased patients found acute proximal tubule damage along with clusters of SARS-CoV-2.[8] So, it is the matter of concern about renal damage and COVID 19 infection.

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Although the mechanism of renal damage and AKI due to COVID-19 is still emerging and there is no specific treatment exists for AKI due to COVID-19, intensive care is largely supportive in this time. The immune system's responses, cytokine storm, viral infection, and other hemodynamic factors might be responsible for AKI and leads to death of many patients due to kidney failure. Again research is needed nationally and internationally to obtain adequate evidence to support routine clinical practice and to develop new gateway to management.

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