

## Perturbations about the COVID-19 and Kidney

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### Abstract

Coronaviruses belong to the Coronavirinae subfamily, which is divided into four genera based on their phylogenetic relationships and genomic structures: Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus. Only mammals can be infected by alphacoronaviruses and betacoronaviruses. Distance learning has its strengths and limitations. A few are enumerated. Gammacoronaviruses and deltacoronaviruses can infect mammals in some cases. Human respiratory diseases are commonly caused by alphacoronaviruses and betacoronaviruses. The two viruses, SARS-CoV and MERS-CoV are highly pathogenic forms and can lead to severe respiratory syndrome in humans, but other human coronaviruses strains like (HCoV-NL63, HCoV-229E, HCoV-OC43 and HKU1) can also cause mild upper respiratory diseases. The origin of SARS-Cov-2 is unknown at this time, but genomic studies indicate that it evolved from a strain found in bats (BatCov RaTG13). Human-to-human transmission, like that of other respiratory pathogens, is primarily via aerosol. Clinical reports suggest that the most frequent symptoms of COVID-19 are fatigue, fever, dry cough, sore throat, dyspnoea, and diarrhea.

**Keywords:** COVID-19; Kidney disease

### Introduction

Leukopenia is the commonly reported laboratory abnormality. Computerized tomography (CT) of the chest is characterized by consolidation or multiple ground-glass opacities involving bilateral sides. Predominantly causing acute respiratory illness, COVID-19 is not confined to only the respiratory system; it may also damage other organs, for instance, the kidneys, heart, gastrointestinal tract, immune, blood, and nervous system. This article attempts to highlight the effect of COVID 19 on the kidneys, with a focus on vulnerable patients undergoing dialysis and renal transplantation.

### Infection with COVID-19 affects the Kidneys

The full pathogenesis of COVID-19 kidney injury is still unknown, but it appears to be multifactorial and disparate. To

begin with, some antecodal reports had shown PCR fragments of coronavirus in the blood and urine of patients infected with SARS and COVID-19, suggesting that novel coronavirus could have a direct cytopathic effect on kidney resident cells. SARS-spike CoV-2's (S) protein employs angiotensin-converting enzyme II (ACE2) as a cell entry receptor and TRMPSS as a cell entry receptor. 12 In the liver, ACE2 is highly expressed. Second, although there is no histological evidence in the literature, immune complexes deposition of viral antigen or virus-induced antibody can cause kidney damage. Another theory is that in severe cases of COVID-19, very high levels of proinflammatory factors like IL2, IL10, IL7, GSCF, MCP1, and TNF were discovered, implying the occurrence of a cytokine storm that can cause injury to the kidney, heart, lung, and other body cells.

### Diagnosis

Clinical presentation, history of contact (epidemiological data), and laboratory parameters such as leukopenia, CT scan, nucleic acid detection, serology (IgM/IgG), and enzyme-linked immunosorbent assay are used to diagnose COVID-19 (ELISA). To test SARS-CoV-2, a nasopharyngeal swab specimen is collected according to CDC guidelines. Real-time quantitative polymerase chain reaction (RT-PCR) and gene sequencing are two key technologies for nucleic acid detection. COVID-19 detection assays are currently being developed both in-house and commercially. C-reactive protein, interleukin-6, serum amyloid A, lactate dehydrogenase, neutrophil-to-lymphocyte ratio, cardiac troponin, lymphocytes, platelet count, and D-dimer are just a few of the biomarkers that have been investigated in COVID-19 patients. In serious patients, two of these, namely a lower total lymphocyte count and a lower platelet count, are seen. Nonetheless, more research and data are needed to understand how different biomarkers behave during the course of illness in COVID-19.

### Dialysis patients with COVID-19

In dialysis patients, fighting SARS-CoV-2 infection is more difficult. Dialysis patients are more susceptible to serious infectious diseases than the general population due to a less effective immune system. COVID-19 infection in dialysis patients may be asymptomatic or have a subtle manifestation. Dialysis centres must be ready to avoid a COVID19 outbreak. 18 During

the COVID-19 epidemic, the Chinese Society of Nephrology and the Taiwan Society of Nephrology issued guidelines for dialysis facilities.

### COVID-19 in renal transplant patients

Owing to the effect of long-term use of immunosuppressants, they may have an atypical presentation of the infection and are also at high risk of developing severe disease. While there is no consensus on how to treat COVID-19 in RAR patients, lowering immunosuppressants with low-dose methylprednisolone is a viable option.

### Conclusion

Kidney dysfunction is common in COVID-19 patients, and it is an independent predictor of death. The pathophysiology of COVID19 kidney involvement is diverse and complex. To intervene and avoid further renal impairment, early detection is critical. To reduce the risk of infection in dialysis patients, strict protocols should be followed.