

Renal Disorders among Corona Virus Disease Patients: A Lethal Condition

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1.Introduction

Corona infection may spread by human-to-human transmission through droplet, oral and direct contact. The incubation period of corona infection is approximately 2-14 days [1] [2] [3]. The World Health Organization (WHO) used the term novel corona virus 2019 to concern to the virus that impact on the lower respiratory tract of patients with pneumonia in Wuhan, China in December 2019.

Although corona virus infection is characterized mainly by diffuse alveolar damage and acute respiratory failure, acute kidney injury (AKI) has developed in a high percentage of cases. As AKI has been shown to be associated with worse prognosis [4]. Apart from pulmonary disorders, acute kidney injury (AKI) is one of the most common and most severe organ complications in COVID-19. The corona virus has been identified in kidney tissues. Moreover, various studies from autopsy and renal biopsy had highlighted the impact of the virus on renal system [5].

Tissue inflammation and local immune cell infiltration have been repeatedly observed and might have a critical role in kidney injury, as might endothelial injury and microvascular thrombi [6]. Among the patients with both at the cellular and systemic levels, the host has evolved mechanisms to counter viral subversion strategies for mutual survival [7]. The aim of this study was to provide a review of renal disorder's prevalence among COVID-19 patients.

2.Methodology

The present study was planned to provide a review of COVID-19 disease's impact on renal system. The databases Web of Science, Scopus, Google Scholar, and PubMed were all thoroughly searched. The research looked at articles about nephropathy, coronavirus disease (COVID-19), kidney injury, and renal diseases. The first search yielded 137 results. Ten publications were chosen and included in this review research after a preliminary screening of titles, abstracts, and full texts and the removal of duplicates.

Inclusion criteria:

A study was included if:

- It focuses on the acute renal injury.
- The sample was composed of COVID-19.
- COVID-19 Patients who develop kidney disease due to COVID-19 infection.
- It includes only COVID-19 patients admitted in hospitals or health institutes.

Exclusion criteria:

If the patient is:

- Suffering from chronic renal disease
- On dialysis
- On ventilator
- Multiple organ failure
- Known case of renal failure

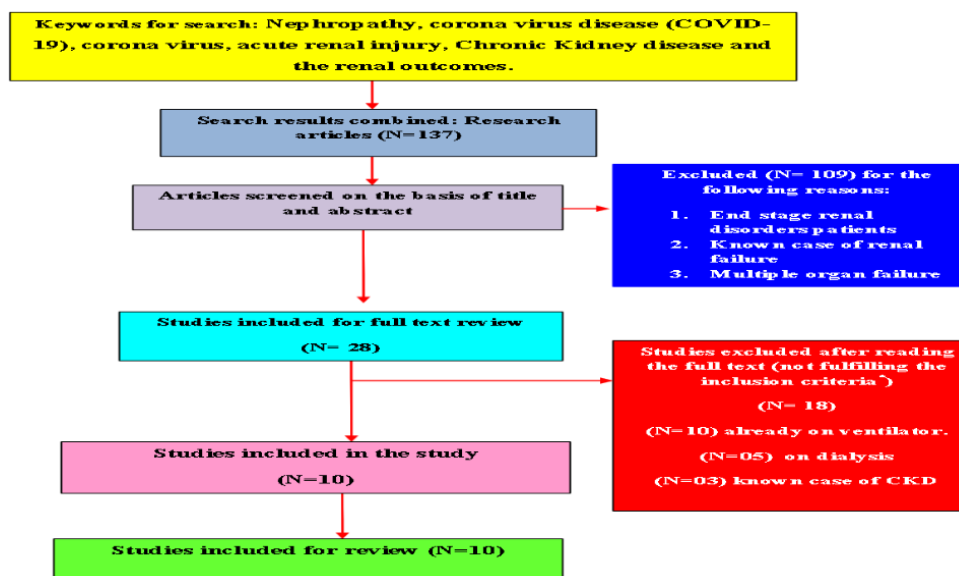


Figure 1: Flow diagram describing process of articles being reviewed and selected for the prevalence of renal disorders among COVID-19 patients

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3.Result

Table 1: Prevalence of renal disorders among COVID-19 patients, N=36026

S. No.	Authors	Type of study	Patients with renal disorders	Sample size	Prevalence
1.	Gupta S. et al ⁸ 2021	Observational study	637	3099	20.6%
2.	Lumlertgul N. et al ⁹ 2021	Retrospective study	240	313	76.7%
3.	Hirsch J. et al ¹⁰ 2020	Retrospective study	1993	5449	36.58%
4.	Chan L. et al ¹¹ 2020	Observational study	1406	3235	43.46%
5.	Minami T. et al ¹² 2020	Systemic review	592	2701	21.92%
6.	Chen T. et al ¹³ 2020	Case series	29	274	10.58%
7.	Wang H. et al ¹⁴ 2020	Retrospective study	4369	19249	22.70%
8.	Zahid U. et al ¹⁴ 2020	Retrospective study	128	469	27.3%
9.	Shen X. ¹⁶ 2020	Retrospective study	56	355	15.78%
10.	Yan Q. ¹⁷ 2020	Retrospective study	115	882	13.04%
Overall prevalence			9565	36026	26.55%

4.Discussion

The findings from various studies expressed that morbidity and mortality levels among patients with renal disorders in COVID-19 infection are higher. A study by Zahid U, et al (2020) [15] explored that AKI in the hospitalized COVID-19 patients was common and carried a high mortality, especially in patients with AKI stage 3. Our findings also revealed that prevalence of Renal disorder was more than 25% among COVID-19 patients.

Another study by Gupta S, et al (2021) 8 highlighted that AKI and renal replacement therapy are common among critically ill patients with COVID-19 and is associated with a hospital mortality rate of >60%. The incidence of COVID-19 among CKD patients was strongly related to the spread of the infection in the community, while its lethality is associated with the underlying kidney condition and comorbidities.

For this reason, it is urgent to offer a direct protection to CKD patients by prioritizing their vaccination [18]. Lotfi B et al (2020) [19] stated that AKI occurs because of the novel corona virus, the mortality rate will be very high. Therefore, further investigations and more studies are needed to recognize the extent and the cause of renal involvement in COVID-19 patients.

The present study concluded that corona virus infection is characterized mainly by diffuse alveolar damage and acute respiratory failure, renal disorders developed in a high percentage of cases. The prevalence of renal disorders among the selected patients was higher. There is need to identify the factors and early management of renal disorders among patients with COVID-19. Hence, clinicians should increase their awareness of kidney disease in patients with COVID-19.

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