

Chapter 10

Clinical Characteristics and Relationship of Acute Kidney Injury With the Severity of Disease and Death in COVID-19 Patients: A Review

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ABSTRACT

Globally, the coronavirus disease 2019 (COVID-19) pandemic has adversely affected healthcare with significant morbidity and mortality among patients due to the virulent effects of the severe acute respiratory syndrome coronavirus 2 (SARS-

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CoV-2). The kidneys and other organs are infected and the development of renal disorders such as acute kidney injury (AKI) and subsequently chronic renal disease if there is no clinical intervention. There is increasing evidence of more COVID-19 patients developing AKI, and incidence of mild, moderate and severe stages of the disease. There is also evidence of significant morbidity and mortality, especially in patients with severe AKI admitted to the intensive care units (ICU). We reviewed the recent publications in PubMed, Google Scholar, Embase and Cochrane library relating to AKI in COVID-19 patients. This review examines (i) multifactorial causes of AKI in COVID-19 and the pathophysiology of this renal disorder, (ii) incidence of AKI in COVID-19 as well as the same in mild, moderate and severe disease, (iii) the association between the incidence of AKI and disease severity as well as mortality in patients with confirmed COVID-19, and (iv) incidence of renal replacement therapy among COVID-19 patients with AKI. The evidence points to the need for early therapeutic intervention and multidisciplinary supportive care for COVID-19 patients. This is critical for COVID-19 patients with comorbidities such as diabetes mellitus, hypertension and cardiovascular diseases as their renal function may be compromised.

INTRODUCTION

In December 2019, several patients in Wuhan, Hubei province, China, presented to hospitals with unknown causes of infectious viral pneumonia (Li et al., 2020). The causative agent of this viral illness with severe respiratory tract association was identified and named by the International Committee on Taxonomy of viruses as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is the pathogen responsible for the coronavirus disease 2019 (COVID-19) (Coronaviridae Study Group, 2020).

Globally, there has been a fast and significant spread of SARS-CoV-2 since its description in December 2019, and on March 11, 2020, the World Health Organization (WHO) declared COVID-19 an international public health emergency. The WHO encouraged all countries to take the necessary precautions to prevent and contain the spread of the SARS-CoV-2 viral infection (WHO, 2020). As of May 3, 2021, the WHO reported that SARS-CoV-2 has spread to 216 countries and worldwide, there have been 152,534,452 established cases of COVID-19. There were also 319,852 deaths, with the majority in the United States of America, Brazil, India, Mexico and the United Kingdom (WHO, 2021).

The clinical expressions of COVID-19 patients comprise symptoms of a viral infection such as fatigue, dyspnea, myalgia, fever, dry or unproductive cough, and the most common serious clinical manifestation of the disease is pneumonia with chest

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