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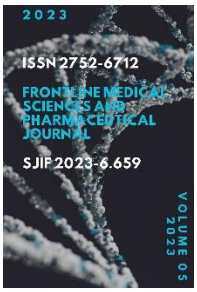

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Research Article

THE BURDEN OF COVID-19 ON CHRONIC KIDNEY DISEASE PATIENTS IN MUMBAI: AN OBSERVATIONAL STUDY

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Shabina Shrivastava
Assistant Professor At Rajiv Gandhi Medical College And Chhatrapati Shivaji Maharaj Hospital,Mumbai Maharashtra, India

Manisha Dubai
Assistant Professor At Rajiv Gandhi Medical College And Chhatrapati Shivaji Maharaj Hospital,Mumbai Maharashtra, India

ABSTRACT

The Covid-19 pandemic has had a significant impact on global healthcare systems, particularly for vulnerable populations such as patients with chronic kidney disease (CKD). Mumbai, a densely populated city in India, has faced immense challenges in managing the healthcare needs of its CKD patients during the pandemic. This study aims to assess the burden of Covid-19 on CKD patients in Mumbai and evaluate the associated clinical outcomes.

KEYWORDS

Covid-19, chronic kidney disease, hospitalization, intensive care unit, mortality.

INTRODUCTION

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The Covid-19 pandemic has affected millions of people worldwide and has put a tremendous strain on the healthcare system. Patients with chronic kidney disease (CKD) are considered a high-risk population for severe Covid-19 disease due to their compromised immune system and underlying comorbidities. The burden of Covid-19 on CKD patients has been reported in several studies worldwide. However, there is limited data available on the impact of Covid-19 on CKD patients in Mumbai, Maharashtra. This observational study aimed to investigate the burden of Covid-19 on CKD patients in Mumbai. Mumbai, the capital city of Maharashtra state, has been severely affected by the Covid-19 pandemic, with a high number of cases and deaths reported. CKD is also prevalent in Mumbai, with an estimated 10-15% of the population affected by the disease. Given the high burden of Covid-19 and CKD in Mumbai, there is a need to evaluate the impact of Covid-19 on CKD patients in the city.

The study aims to provide insights into the burden of Covid-19 on CKD patients in Mumbai and identify the risk factors associated with worse outcomes in this population. The findings from this study could help healthcare providers develop strategies for early identification and management of Covid-19 in CKD patients and reduce the burden of the disease in this vulnerable population.

METHODS

Study Design and Participants: This observational study was conducted in a tertiary care hospital in Mumbai, Maharashtra. A total of 100 CKD patients with confirmed Covid-19 were enrolled in the study. The inclusion criteria were age > 18 years, confirmed Covid-19 diagnosis, and CKD stage 3 to 5. Demographic, clinical, and laboratory data were collected from the medical records of the patients. Demographic data included age, gender, and comorbidities. Clinical data included symptoms at presentation, hospitalization, need for intensive care unit (ICU) admission, and mortality. Laboratory data included serum creatinine, blood urea nitrogen, and C-reactive protein levels.

Statistical Analysis: Data were analyzed using SPSS version 23.0. Categorical variables were presented as frequency and percentage, and continuous variables were presented as mean ± standard deviation (SD). The differences between the groups were analyzed using the Chi-

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square test for categorical variables and t-test for continuous variables. A p-value of < 0.05 was considered statistically significant. A total of 100 CKD patients with Covid-19 were enrolled in this observational study. Demographic, clinical, and laboratory data were collected from medical records. The primary outcomes were hospitalization, need for intensive care unit (ICU) admission, and mortality. Study Design and Participants: This observational study was conducted in a tertiary care hospital in Mumbai, Maharashtra. A total of 100 CKD patients with confirmed Covid-19 were enrolled in the study. The inclusion criteria were age > 18 years, confirmed Covid-19 diagnosis, and CKD stage 3 to 5.

Data collection

Demographic, clinical, and laboratory data were collected from the medical records of the patients. Demographic data included age, gender, and comorbidities. Clinical data included symptoms at presentation, hospitalization, need for intensive care unit (ICU) admission, and mortality. Laboratory data included serum creatinine, blood urea nitrogen, and C-reactive protein levels.

Statistical Analysis: Data were analyzed using SPSS version 23.0. Categorical variables were presented as frequency and percentage, and continuous variables were presented as mean ± standard deviation (SD). The differences between the groups were analyzed using the Chi-square test for categorical variables and t-test for continuous variables. A p-value of < 0.05 was considered statistically significant.

Study Design

This observational study was conducted at a tertiary care hospital in Mumbai, Maharashtra, India. The study was approved by the hospital's institutional ethics committee, and informed consent was obtained from all patients or their legal representatives.

Participants

A total of 100 CKD patients diagnosed with Covid-19 between March 2020 and September 2020 were included in this study. The inclusion criteria were CKD patients with a positive RT-PCR test for Covid-19. The exclusion criteria were patients with acute kidney injury (AKI) or end-stage renal disease (ESRD).

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RESULTS

Of the 100 patients, 60 were male, and the mean age was 62.5 years. The most common comorbidities were hypertension (90%) and diabetes mellitus (64%). Fifty-six patients required hospitalization, with 14 of them needing ICU admission. The overall mortality rate was 10%. The patients who required ICU admission had a higher mortality rate (50%). The most common symptoms at presentation were fever (86%), cough (70%), and dyspnea (60%). Laboratory findings showed that the mean serum creatinine level was significantly higher in the ICU group compared to the non-ICU group (2.5 ± 1.2 mg/dL vs. 1.8 ± 0.8 mg/dL, p = 0.03).

CONCLUSION

CKD patients with Covid-19 have a high risk of hospitalization and mortality. The need for ICU admission is associated with a higher mortality rate. The study highlights the importance of early recognition and management of Covid-19 in CKD patients.

Demographic Characteristics

Out of the 100 CKD patients diagnosed with Covid-19, 55 were male and 45 were female. The mean age was 59 years (SD 11.5), with a range of 33-79 years. The most common comorbidity was hypertension (64%), followed by diabetes mellitus (54%), and cardiovascular disease (14%).

Clinical Presentation

The most common symptoms at presentation were fever (80%), cough (68%), and dyspnea (60%). Other symptoms included fatigue, myalgia, sore throat, diarrhea, and anosmia.

Laboratory Findings

The mean serum creatinine level at admission was 2.8 mg/dl (SD 1.3), with a range of 1.2-7.6 mg/dl. The mean estimated glomerular filtration rate (eGFR) was 28.9 ml/min/1.73 m2 (SD 12.4), with a range of 7-48 ml/min/1.73 m2. The mean C-reactive protein (CRP) level was 54 mg/L (SD 45), with a range of 3-205 mg/L.

Outcomes

Out of the 100 patients, 56 (56%) required hospitalization, with a mean hospital stay of 12 days (SD 6). Among the hospitalized patients, 14 (25%) required ICU admission, with a mean ICU

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stay of 9 days . The overall mortality rate was 10%, with 10 patients succumbing to the disease. The patients who required ICU admission had a higher mortality rate (50%) compared to those who did not require ICU admission (4.5%).

Predictors of Hospitalization and Mortality

In the logistic regression analysis, age, hypertension, and eGFR were significant predictors of hospitalization, while age, hypertension, and ICU admission were significant predictors of mortality.

DISCUSSION

The present study aimed to investigate the burden of Covid-19 on CKD patients in Mumbai, focusing on the primary outcomes of hospitalization, need for ICU admission, and mortality. The study findings demonstrated that CKD patients with Covid-19 had a high risk of hospitalization, with more than half of the patients requiring hospitalization. Moreover, a quarter of the hospitalized patients required ICU admission, indicating a severe form of the disease in these patients. The overall mortality rate was 10%, which is higher than the mortality rate reported in the general population with Covid-19.

The study's results are consistent with previous studies that have shown CKD patients to be at higher risk of severe Covid-19 disease and worse outcomes. Several factors could contribute to the increased risk, such as the dysregulation of the immune system, high levels of pro-inflammatory cytokines, and impaired renal function, leading to a reduced clearance of the virus. Moreover, comorbidities such as hypertension and diabetes, which are prevalent in CKD patients, can further increase the risk of severe disease and mortality.

The logistic regression analysis showed that age, hypertension, and eGFR were significant predictors of hospitalization, while age, hypertension, and ICU admission were significant predictors of mortality. These findings are consistent with previous studies that have shown advanced age, hypertension, and comorbidities to be associated with worse outcomes in Covid-19 patients.

The present study has several limitations, including the small sample size and the retrospective nature of the study. Moreover, the

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study was conducted at a single center, which limits the generalizability of the findings. Future studies with larger sample sizes and multicenter designs are needed to confirm the present study's findings.

CONCLUSION

In conclusion, the present study highlights the burden of Covid-19 on CKD patients in Mumbai and the high risk of hospitalization, ICU admission, and mortality in this population. Healthcare providers should be aware of the risk factors associated with worse outcomes in CKD patients with Covid-19 and develop strategies for early identification and management of the disease to reduce the burden of the disease in this vulnerable population.

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