



Original Research Article

Impact of Antihypertensive Treatment in COVID-19 Patients in a Tertiary Care Hospital

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Abstract: Hypertension is among the most common comorbidities observed in hospitalized COVID-19 patients, raising questions about the impact of ongoing antihypertensive therapy on outcomes. This study reviews recent evidence from tertiary care settings to evaluate the effects of antihypertensive regimens—such as ACE inhibitors (ACEIs), angiotensin receptor blockers (ARBs), calcium channel blockers (CCBs), and beta-blockers—on COVID-19 severity, length of hospital stay, and mortality. Regular control of hypertension is strongly correlated with better outcomes, while the disruption of treatment and irregular therapy elevate risks of severe disease and mortality. The choice of antihypertensive class, particularly decisions regarding renin-angiotensin-aldosterone system (RAAS) inhibition, plays an important but nuanced role in patient prognosis.

Keywords: Hypertension, Cardiovascular disease, COVID-19, ACEIs and ARBs, ACE2.

INTRODUCTION

Hypertension and cardiovascular disease have been widely reported as risk factors for severe COVID-19 outcomes. During the initial phases of the pandemic, uncertainties regarding the safety of ACEIs and ARBs fueled debate due to their interaction with ACE2, the viral entry receptor for SARS-CoV-2. As tertiary care hospitals manage heterogeneous populations—often with multiple comorbidities and requiring complex interventions—the impact of antihypertensive treatment deserves special scrutiny. Understanding which therapeutic approaches yield optimal outcomes is critical for evidence-based management.

METHODS

This review synthesizes peer-reviewed research published between 2021 and 2024 on the topic of antihypertensive therapy among COVID-19 patients admitted to tertiary care settings. Cohort studies, retrospective analyses, meta-analyses, and hospital-based observational data were collected, focusing on the following parameters:

- Prevalence and types of antihypertensive therapy in hospitalized COVID-19 patients.
- Outcomes including: severity of disease, need for intensive care, mortality, and complications.
- Influence of adherence/continuity of antihypertensive treatment.
- Comparative effects of various drug classes.

RESULTS

1. Prevalence of Hypertension in COVID-19 Hospitalizations

- Hypertension was present in approximately 46% of COVID-19 hospitalizations in one large study, rising to 75% among fatal cases^[1].
- Most patients receiving antihypertensive drugs fell into ACEI/ARB or CCB cohorts, with many on multi-drug therapy^{[2][3]}.

2. Association of Antihypertensive Therapy with COVID-19 Outcomes

Regular vs. Irregular Treatment

- Discontinuation or irregular antihypertensive therapy is associated with increased in-hospital mortality and worse prognosis^{[1][4]}.
- Duration of therapy also matters: patients on long-term therapy (>4.5 years) showed differences in outcome, with greater risk accumulation with age and inflammatory activity^[2].

Drug Classes and Outcomes

Drug Class	Primary Findings	Evidence
ACEIs/ARBs	Regular use not associated with increased mortality or severity ^{[5][3]} ; may reduce severity and inflammatory markers ^[3]	[5][3]
CCBs	Observed higher rates of critical cases and mortality ^[2]	[2]
Any first-line drug	Treatment reduces mortality relative to no treatment ^[5]	[5]

Antihypertensive Treatment Continuity Chart

The graph below illustrates outcomes for hypertensive COVID-19 patients who continued versus discontinued antihypertensive therapy.

3. Comorbidity Interactions

- Diabetes mellitus, advanced age, and hypertension have compounded effects on mortality, making strict antihypertensive management vital in these groups^[1].
- COVID-19 itself is associated with increased prevalence of acute complications such as ARDS and cardiac injury, especially in hypertensive and older patients^{[2][6]}.

4. Antihypertensive Therapy and Hospital Stay

- No significant differences in hospital stay or ICU admission rates have been conclusively demonstrated between different antihypertensive classes^[7].
- Patients on antihypertensive therapy often presented with higher blood pressure on admission, likely reflecting more advanced disease rather than pharmacologic effects^[5].

5. Long-Term Effects and Post-COVID Considerations

- Patients may develop new-onset hypertension post-COVID-19, particularly after severe or hospitalized episodes, supporting ongoing monitoring and early antihypertensive intervention^[6].

DISCUSSION

During the COVID-19 pandemic, management of hypertension in hospitalized patients remains crucial. The majority of current studies advocate for the continuation of chronic antihypertensive therapy—even for RAAS blockers such as ACEIs/ARBs—due to the absence of evidence showing harm, and some evidence suggesting benefit, especially in terms of inflammatory modulation^[3].

Adherence is critical: Disruptions in therapy increase mortality and lead to poor outcomes^{[1][4]}. Hospitalized patients with regular, long-term antihypertensive treatment are more likely to survive severe COVID-19. There is no compelling evidence that certain antihypertensive drug classes significantly worsen COVID-19 outcomes; rather, untreated or irregularly treated hypertension is more dangerous.

Because tertiary care hospitals encounter populations with multiple comorbidities, patient stratification—considering age, comorbid conditions, inflammatory markers, and treatment history—is essential. Modern guidelines advise the continuation, rather than discontinuation, of antihypertensive medications in the absence of contraindications.

CONCLUSION

- Hypertension is a major risk factor for severe COVID-19 outcomes in tertiary care COVID-19 wards.

- Continuation of any first-line antihypertensive therapy confers survival benefit; irregular or interrupted treatment is associated with higher mortality.
- No consistent evidence supports discontinuing ACEIs/ARBs or any major antihypertensive class during COVID-19, and RAAS blockade may be beneficial.
- Multi-morbidity, advanced age, and inflammatory status compound risks—highlighting the need for aggressive and consistent blood pressure management in COVID-19 inpatients.
- Strategies for improved adherence and early post-discharge screening for new-onset hypertension are warranted.

Recommendations

- **Continue regular antihypertensive therapy** throughout COVID-19 illness unless contraindicated.
- Screen for hypertension in all hospitalized COVID-19 patients and monitor closely post-discharge^[6].
- Further research is needed to identify differential effects among antihypertensive drug classes and to optimize treatment in populations with complex comorbidities^{[5][2][3]}.

Graphical Summary

- **Figure 1:** Mortality rates in COVID-19 patients (controlled vs. uncontrolled hypertension).
- **Figure 2:** Proportion of patients by antihypertensive therapy class and outcome severity.

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