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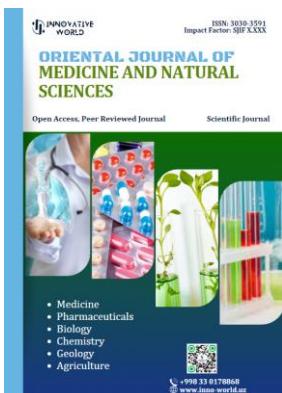
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## PREVALENCE OF ARTERIAL HYPERTENSION AMONG ELDERLY COVID-19 PATIENTS AND ITS IMPACT ON CARDIOVASCULAR OUTCOMES

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**Abstract:** Arterial hypertension is a prevalent comorbidity among elderly COVID-19 patients and has been linked to increased disease severity and adverse cardiovascular outcomes. Studies indicate that hypertension affects a significant proportion of elderly COVID-19 patients, with prevalence rates varying from 25% to 58.6%. Hypertensive patients are at higher risk of requiring ICU admission, developing cardiovascular complications, and experiencing increased mortality. Antihypertensive medications, particularly ACE inhibitors and ARBs, have been associated with improved outcomes, including reduced mortality and hospitalization risks. Continuation of antihypertensive therapy during COVID-19 infection is recommended to mitigate adverse cardiovascular effects and improve patient prognosis.

**Keywords:** hypertension, elderly, COVID-19, cardiovascular outcomes, antihypertensive therapy

### Introduction

Arterial hypertension is a prevalent comorbidity among elderly patients with COVID-19 and has been extensively studied for its impact on disease severity and outcomes. This response synthesizes findings from multiple studies to provide a comprehensive overview of the prevalence of hypertension in elderly COVID-19 patients and its effects on cardiovascular outcomes.

### Prevalence of Arterial Hypertension in Elderly COVID-19 Patients

#### Overall Prevalence

- Hypertension is a common comorbidity in elderly COVID-19 patients, with studies reporting varying prevalence rates. A retrospective observational study found that 45.3% of elderly COVID-19 patients had hypertension [1].
- A meta-analysis of 1468 studies involving 1,281,510 patients reported a pooled prevalence of hypertension in COVID-19 patients as 25% [12].
- Another systematic review and meta-analysis estimated the prevalence of hypertension in hospitalized COVID-19 patients to be 31% [13].

#### Age-Related Prevalence

- Elderly patients (aged 60 years and older) with COVID-19 are more likely to have hypertension compared to younger patients. A study conducted in a Russian cohort found that 55.9% of elderly COVID-19 patients had hypertension [6].
- Similarly, a study from Bangladesh reported that 58.6% of hypertensive COVID-19 patients were elderly [19].

### Gender Differences

- Male patients are more likely to have hypertension than females. A study from Bangladesh found that 71.8% of hypertensive COVID-19 patients were male [19].
- However, another study found no significant gender-specific differences in the prevalence of hypertension among COVID-19 patients [6].

## Impact of Hypertension on Cardiovascular Outcomes in Elderly COVID-19 Patients

### Severity of COVID-19

- Hypertension is independently associated with more severe forms of COVID-19 in elderly patients. A retrospective cohort study found that hypertensive patients had higher neutrophil-to-lymphocyte ratios, lactate dehydrogenase levels, and severity of lung lesions compared to non-hypertensive patients [1].
- Hypertensive patients are more likely to require intensive care unit (ICU) admission and invasive ventilation. A study from Russia reported that 22.9% of hypertensive patients required ICU admission compared to 11.0% of non-hypertensive patients [6].

### Mortality Risk

- Hypertension significantly increases the risk of in-hospital mortality in elderly COVID-19 patients. A study from Portugal found that hypertensive patients had a higher odds ratio (OR) of 4.540 for in-hospital death compared to non-hypertensive patients [3].
- A case-control study from Indonesia reported that hypertensive patients had a 6.71-fold increased risk of death compared to non-hypertensive patients [11].

### Cardiovascular Complications

- Hypertensive COVID-19 patients are at higher risk of developing cardiovascular complications such as acute left ventricular failure, cardiogenic shock, and arrhythmias. A study from Bangladesh found that 12.3% of hypertensive COVID-19 patients developed acute left ventricular failure compared to 5.5% of non-hypertensive patients [19].
- Hypertensive patients are also more likely to experience sepsis and multi-organ failure, which are associated with poor outcomes [9].

### Role of Antihypertensive Medications in COVID-19 Outcomes

#### Protective Effects of Antihypertensive Agents

- The use of antihypertensive medications, particularly angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin receptor

blockers (ARBs), has been associated with improved outcomes in hypertensive COVID-19 patients. A meta-analysis found that ACEIs and ARBs reduced the risk of in-hospital mortality by 29% and 31%, respectively [17].

- A study from Spain reported that enalapril and candesartan, specific ACEIs and ARBs, were associated with a significant reduction in the risk of hospitalization, mortality, and disease progression [15].

### Benefits of Continuing Antihypertensive Therapy

- Continuing antihypertensive therapy during COVID-19 hospitalization is associated with a lower risk of in-hospital death. A study from Poland found that patients receiving any first-line antihypertensive medication had a 75% lower risk of in-hospital death compared to untreated hypertensive patients [5].
- A systematic review and meta-analysis confirmed that continuous administration of antihypertensive agents significantly reduced in-hospital mortality among hypertensive COVID-19 patients [17].

### Specific Cardiovascular Outcomes in Hypertensive COVID-19 Patients

#### Acute Kidney Injury (AKI)

- Hypertensive COVID-19 patients are at higher risk of developing AKI, which is associated with poor outcomes. A study from China found that elderly hypertensive patients with COVID-19 had higher serum creatinine levels and lower estimated glomerular filtration rates (eGFR) compared to non-hypertensive patients [10].

#### Cardiac Biomarkers and Myocardial Injury

- Hypertensive COVID-19 patients are more likely to have elevated cardiac biomarkers such as troponin and lactate dehydrogenase, which are associated with myocardial injury and poor prognosis. A study from the United Kingdom found that hypertensive patients with COVID-19 had higher troponin levels and were more likely to experience myocardial injury [14].

#### Vascular Stiffness and Microalbuminuria

- COVID-19 exacerbates vascular stiffness and microalbuminuria in hypertensive patients, which are markers of cardiovascular disease progression. A study from Russia found that hypertensive patients who had COVID-19 had higher levels of microalbuminuria and pulse wave velocity compared to those who did not have COVID-19 [16].

**Table 1.0 Summary of Key Findings**

Study	Prevalence of Hypertension	Key Outcomes
Retrospective Cohort Study	45.3%	Higher ICU admission (22.9% vs. 11.0%) and mortality (15.2% vs. 2.4%) [1]

Meta-Analysis	25%	Increased risk of death (RR: 1.79), disease severity (RR: 1.74), and ICU admission (RR: 1.91) [12]
Case-Control Study	54%	6.71-fold increased risk of death in hypertensive patients [11]
Prospective Observational	58.6%	Higher in-hospital complications (12.3% vs. 5.5%) and death (4.7% vs. 2.9%) [19]

## Conclusion

Arterial hypertension is a prevalent comorbidity among elderly COVID-19 patients and is associated with more severe disease, higher rates of ICU admission, and increased mortality. The use of antihypertensive medications, particularly ACEIs and ARBs, has been shown to improve outcomes in hypertensive COVID-19 patients. Continued antihypertensive therapy during COVID-19 hospitalization is strongly recommended to reduce the risk of adverse cardiovascular outcomes.

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