

Association of Inpatient Use of Angiotensin Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers with Mortality Among Patients With Hypertension Hospitalized With COVID-19

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ABSTRACT

Rationale: Use of angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II receptor blockers (ARBs) is a major concern for clinicians treating coronavirus disease 2019 (COVID-19) in patients with hypertension.

Objective: To determine the association between in-hospital use of ACEI/ARB and all-cause mortality in COVID-19 patients with hypertension.

Methods and Results: This retrospective, multi-center study included 1128 adult patients with hypertension diagnosed with COVID-19, including 188 taking ACEI/ARB (ACEI/ARB group; median age 64 [IQR 55-68] years; 53.2% men) and 940 without using ACEI/ARB (non-ACEI/ARB group; median age 64 [IQR 57-69]; 53.5% men), who were admitted to nine hospitals in Hubei Province, China from December 31, 2019 to February 20, 2020. Unadjusted mortality rate was lower in the ACEI/ARB group versus the non-ACEI/ARB group (3.7% vs. 9.8%; $P = 0.01$). In mixed-effect Cox model treating site as a random effect, after adjusting for age, gender, comorbidities, and in-hospital medications, the detected risk for all-cause mortality was lower in the ACEI/ARB group versus the non-ACEI/ARB group (adjusted HR, 0.42; 95% CI, 0.19-0.92; $P = 0.03$). In a propensity score-matched analysis followed by adjusting imbalanced variables in mixed-effect Cox model, the results consistently demonstrated lower risk of COVID-19 mortality in patients who received ACEI/ARB versus those who did not receive ACEI/ARB (adjusted HR, 0.37; 95% CI, 0.15-0.89; $P = 0.03$). Further subgroup propensity score-matched analysis indicated that, compared to use of other antihypertensive drugs, ACEI/ARB was also associated with decreased mortality (adjusted HR, 0.30; 95%CI, 0.12-0.70; $P = 0.01$) in COVID-19 patients with hypertension.

Conclusions: Among hospitalized COVID-19 patients with hypertension, inpatient use of ACEI/ARB was associated with lower risk of all-cause mortality compared with ACEI/ARB non-users. While study interpretation needs to consider the potential for residual confounders, it is unlikely that in-hospital use of ACEI/ARB was associated with an increased mortality risk.