AB022. Angiotensin receptor blocker (ARB) versus angiotensin-converting enzyme inhibitor (ACE-I) use for new-onset pneumonia and lung infections: a propensity score-matched population-based cohort study with competing risk analyses

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Background: The effects of angiotensin receptor blockers (ARB) and angiotensin-converting enzyme inhibitors (ACE-I) on new-onset respiratory tract infections remain unclear. This study aimed to compare the risks of pneumonia and lung infections between ARB and ACE-I users.

Methods: This retrospective cohort study included patients who were prescribed ARB/ACE-I in Hong Kong between 1st January 2000 and 31st August 2020. The primary outcomes were new-onset pneumonia and new-onset bacterial, viral, and influenza lung infections. The secondary outcomes were pneumonia, cardiovascular, and all-cause mortality. Patients <18 years old or with prior diagnoses of the above events were excluded. A one-year lag time since initial ARB/ACE-I use was introduced to account for the latency of outcomes and reverse causality. 1:1 propensity score matching was performed based on demographics, prior comorbidities, use of other medications, and laboratory tests.

Results: After 1:1 propensity score matching, the study cohort consisted of 54,436 ARB users (45.9% male, mean age: 69.3±13.6 years, median follow-up time: 4.8 years [interquartile range (IQR): 3.1–7.8)] and 54,436 matched ACE-I users [54.0% male, mean age: 68.3±13.6 years, median follow-up time: 7.6 years (IQR: 4.3–13.5)]. ARB use was associated with higher risks of pneumonia [hazard ratio (HR): 5.73, 95% confidence interval (CI): 4.49–7.32, P<0.0001], bacterial lung infection (HR: 4.17, 95% CI: 2.94–5.91, P<0.0001), viral lung infection (HR: 4.02, 95% CI: 1.83–8.83, P=0.0005), influenza lung infection (HR: 9.84, 95% CI: 6.61–14.63, P<0.0001), pneumonia mortality (HR: 2.86. 95% CI: 2.78–2.95, P<0.0001), cardiovascular mortality (HR: 2.36, 95% CI: 2.30–2.42, P<0.0001), and all-cause mortality (HR: 1.82, 95% CI: 2.30–2.42, P<0.0001) than ACE-I use. These associations remained significant across follow-up times since initial ARB/ACE-I use. However, in the first three years, there were no significant differences in the risks of bacterial and viral lung infections, and mortality between ARB and ACE-I users. The results were confirmed by sensitivity analyses with cause-specific hazard models and sub-distribution hazard models.

Conclusions: The use of ARB was associated with higher risks of pneumonia, lung infections, and mortality than ACE-I use. The decision whether to prescribe ARB or ACE-I for short-term treatment should be made by weighing pneumonia and mortality risks.

Keywords: Angiotensin receptor antagonists; angiotensin-converting enzyme inhibitors; pneumonia; influenza; mortality

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related

to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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