Association between angiotensin blockade and COVID-19 severity in Hong Kong

We read with interest the recent commentary by Quinn and colleagues[1] on the incidence and severity of coronavirus disease 2019 (COVID-19) in patients taking angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs). Recent observational studies did not show increased risk of disease severity with ACE inhibitor/ARB use,[2,3] and another observational study[4] even reported a lower mortality risk with ACE inhibitors (adjusted odds ratio [OR] 0.33). However, these studies did not adjust for laboratory parameters, which may confound the observed associations.

We conducted a retrospective cohort study using data from a territory-wide electronic health care database of the Hong Kong Hospital Authority. We identified all patients aged 18 years or older diagnosed with COVID-19 between Jan. 1, 2020, and Apr. 27, 2020. The primary outcome was severe disease, defined as severe pneumonia, critical complications (respiratory failure, septic shock and/or multiple organ dysfunction), ventilatory support (invasive or noninvasive), admission to the intensive care unit, or death. Drug exposure, including ACE inhibitors and ARBs, was defined as ever having taken these medications in the 5 years before admission. We performed multivariable logistic regression, adjusting for age, sex, comorbidities (diabetes mellitus, hypertension, ischemic heart disease, stroke and atrial fibrillation), other medication use (acetylsalicylic acid, statins, proton pump inhibitors) and laboratory tests (leukocyte, platelet, C-reactive protein, creatinine, sodium, potassium, alkaline phosphatase, alanine aminotransferase, albumin, globulin and lactate dehydrogenase levels).

Of 734 patients with COVID-19, 73 (9.9%) had severe disease. Thirteen were using ACE inhibitors and 18 were using ARBs. Use of ACE inhibitors was associated with a lower risk of severe disease (adjusted OR 0.14, 95% confidence interval [CI] 0.02–0.87), but there was no significant association between use of ARBs and severe disease (adjusted OR 1.86, 95% CI 0.31–9.97). Other independent risk factors for severe disease were leukocyte count greater than 11×10^9/L (adjusted OR 5.98, 95% CI 1.55–2.19), C-reactive protein greater than 1 mg/dL (adjusted OR 3.42, 95% CI 1.76–6.68), and lactate dehydrogenase greater than 280 U/L (adjusted OR 5.91, 95% CI 2.89–12.13).

Our findings corroborate the results of Mehra and colleagues,[4] who reported a lower mortality with use of ACE ihibitors. Although ACE inhibitors and ARBs should not be discontinued in COVID-19, further multicentre studies including patients of different ethnicities are needed to clarify the potential beneficial effects of these medications.

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