Types of anti-hypertensive medication for post-transplant hypertension and risk of graft failure

Sehoon Park¹, Sung Jin Kang², Ji Eun Kim³, Yaerim Kim⁴, Kwangsoo Kim⁵, Minsu Park⁶, Yon Su Kim⁷,
Yaeji Lee², Hajeong Lee⁷

¹Division of Nephrology, Department of Internal Medicine, Korean Armed Forces Capital Hospital, Seongnam, Korea

²Department of Applied Statistics, Chung-Ang University, Seoul, Korea

³Division of Nephrology, Department of Internal Medicine, Hanyang University Guri Hospital, Guri, Korea

⁴Division of Nephrology, Department of Internal Medicine, Keimyung University School of Medicine, Daegu, Korea

⁵Transdisciplinary Department of Medicine & Advanced Technology, Seoul National University Hospital, Seoul, Korea

⁶Department of Statistics, Keimyung University, Daegu, Korea

⁷Division of Nephrology, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea

Background: Additional study is warranted to reveal an appropriate anti-hypertensive medication treatment strategy for post-transplant hypertension in kidney transplant recipients.

Methods: The study included transplant recipients who maintained functioning graft for at least 1 year from transplantation, collected from the nationwide claims database of South Korea during 2008 to 2017. The usage of antihypertensive medications between 6 months to 1 year was the main exposure, and those who had inconsistent/transient usage of antihypertensive drugs were excluded. The prognostic outcome was death-censored graft failure and we also investigated the post-transplant major adverse cardiovascular events (MACEs) outcome.

Results: We included 8,014 patients without post-transplant hypertension and 6,114 recipients who received treatments for hypertension in the post-transplant period. Among them, 1,972 patients (33%) received multiple anti-hypertensive medications, and among single-agent users, 1,690 patients (28%) received dihydropyridine-calcium-channel-blocker, 1,807 (30%) received beta-blockers, 475 (29%) received renin-angiotensin-aldosterone-blockers, and 170 (<1%) received other types of antihypertensive medications, respectively. Those with post-transplant hypertension had significantly worse risk of death-censored graft failure than those without (hazard ratio [HR], 1.25; 95% confidence interval [CI], 1.08–1.46) than those without. In addition, those who received multiple drugs showed significantly higher MACEs risk than those who did not require anti-hypertensive treatments (HR, 1.35; 95% CI, 1.01–1.81). Among the single-agent user, those who received beta-blocker showed significantly higher risk of death-censored graft failure (HR, 1.39; 95% CI, 1.12–1.72), while those who received calcium-channel blocker showed significantly lower risks (HR, 0.81; 95% CI, 0.65–1.00) than the others. The single-agent user who received renin-angiotensin-aldosterone-blockades showed similar graft prognosis with the other medication users (HR, 0.77; 95% CI, 0.52–1.14). Among the multi-agent users, no significant prognostic differences were identified according to the types of anti-hypertensive medications.

Conclusions: Post-transplant hypertension is associated with poor post-kidney transplant prognosis, particularly when multiple types of medications were required for treatment. This study supports that dihydropyridine calcium-channel-blocker may be considered as the initial choice for post-transplant hypertension.

Corresponding author: Sehoon Park

E-mail: mailofsehoon@gmail.com