

Comparative Effectiveness of Different Antihypertensive Agents in Kidney Transplantation: A Systematic Review and Meta-Analysis

Anna Pisano ¹, Davide Bolignano ¹, Francesca Mallamaci ¹, Graziella D'Arrigo ¹, Jean-Michel Halimi ², Alexandre Persu ^{3 4}, Gregoire Wuerzner ⁵, Pantelis Sarafidis ⁶, Bruno Watschinger ⁷, Michel Burnier ⁵, Carmine Zoccali ¹

Affiliations + expand

PMID: 31143926 DOI: [10.1093/ndt/gfz092](#)

Abstract

Background: We conducted a systematic review and meta-analysis to compare benefits and harms of different antihypertensive drug classes in kidney transplant recipients, as post-transplant hypertension (HTN) associates with increased cardiovascular (CV) morbidity and mortality.

Methods: The Ovid-MEDLINE, PubMed and CENTRAL databases were searched for randomized controlled trials (RCTs) comparing all main antihypertensive agents versus placebo/no treatment, routine treatment.

Results: The search identified 71 RCTs. Calcium channel blockers (CCBs) (26 trials) reduced the risk for graft loss [risk ratio [RR] 0.58 [95% confidence interval (CI) 0.38-0.89]], increased glomerular filtration rate (GFR) [mean difference (MD) 3.08 mL/min (95% CI 0.38-5.78)] and reduced blood pressure (BP). Angiotensin-converting enzyme inhibitors (ACEIs) (13 trials) reduced the risk for graft loss [RR 0.62 (95% CI 0.40-0.96)] but decreased renal function and increased the risk for hyperkalaemia. Angiotensin receptor blockers (ARBs) (10 trials) did not modify the risk of death, graft loss and non-fatal CV events and increased the risk for hyperkalaemia. When pooling ACEI and ARB data, the risk for graft failure was lower in renin-angiotensin system (RAS) blockade as compared with control treatments. In direct comparison with ACEIs or ARBs (11 trials), CCBs increased GFR [MD 11.07 mL/min (95% CI 6.04-16.09)] and reduced potassium levels but were not more effective in reducing BP. There are few available data on mortality, graft loss and rejection. Very few studies performed comparisons with other active drugs.

Conclusions: CCBs could be the preferred first-step antihypertensive agents in kidney transplant patients, as they improve graft function and reduce graft loss. No definite patient or graft survival benefits were associated with RAS inhibitor use over conventional treatment.

Keywords: antihypertensive agents; kidney transplantation; meta-analysis; systematic review.