Renal and cardiovascular benefits of treatment with angiotensin receptor blockers in patients with hypertension and chronic kidney disease: A systematic review and meta-analysis

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Topic(s):
Hypertension: Pharmacotherapy

Citation:

Background: Blood pressure (BP) control is critical in delaying the progression of chronic kidney disease (CKD), which otherwise results in an increased risk of cardiovascular morbidity and mortality. Angiotensin II receptor blockers (ARBs) or angiotensin-converting enzyme inhibitors, are recommended by several guidelines as first-line treatment for patients with hypertension and CKD.

Purpose: We reviewed and analysed the effect of ARB treatment on BP and renal outcomes (estimated glomerular filtration rate (eGFR), serum creatinine (SCr), creatinine clearance (CrCl) or proteinuria) in patients with hypertension and CKD with or without diabetes, including large clinical trials such as RENAAL and IDNT.

Methods: MEDLINE, EMBASE, and BIOSIS databases were searched for literature from the earliest available date to July 2017. Randomised (parallel-group) controlled trials of ≥8 weeks assessed the impact of ARBs on systolic/diastolic BP (SBP/DBP), eGFR, SCr, CrCl or proteinuria were included in the analysis. Meta-analysis (post- versus pre-treatment) and meta-regression were conducted in R-statistical software (v3.4.1) using meta- and metafor-packages. Mean difference (MD, generic inverse variance) with 95% confidence intervals (CIs) was used to pool data for an outcome in a single forest plot. The risk of bias (quality) of included studies was assessed by the six items of the Cochrane instrument.

Results: Of the 165 articles assessed for eligibility, 24 studies were included in the analysis (19 evaluated ARBs as monotherapy, 4 evaluated ARBs in combination with other antihypertensives and 1 evaluated ARBs both as mono- and combination therapy). Treatment with ARBs as monotherapy for ≥8 weeks to <1 year significantly reduced mean office SBP (MD, -12.60 mmHg; 95% CI, -18.53 to -6.67)/DBP (-6.52 mmHg; -11.27 to -1.77) (p<0.01). BP reduction was also significant (p<0.01) with ARB monotherapy for ≥1 year SBP (-14.84 mmHg; -17.82 to -11.85)/DBP (-10.27 mmHg; -12.26 to -8.27). ARBs also significantly reduced SBP/DBP when combined with other antihypertensive treatments for ≥8 weeks to <1 year as well as for ≥1 year (Figure). Moreover, ARBs induced significant reductions (p<0.01) in proteinuria (≥8 weeks to <1 year [MD, -0.6 g/L; 95% CI, -0.93 to -0.26; ≥1 year [-0.9 g/L; -1.22 to -0.59]), but no significant changes in eGFR, CrCl or SCr levels. The beneficial effect of ARBs was maintained overtime with no significant additional impact on SBP change (estimate: 0.025; 95% CI, -0.14 to 0.19) or eGFR (estimate: -0.068; 95% CI, -0.14 to 0.28; p=0.53). The overall risk of bias was judged to be low.

Conclusion: Treatment with ARBs effectively and sustainably lowered BP and proteinuria with no significant change in eGFR in patients with hypertension and CKD with or without diabetes.
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