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Effect of mineralocorticoid receptor antagonists on proteinuria and progressionof chronic kidney disease: a systematic review and meta-analysis

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Abstract

Background: Hypertension and proteinuria are critically involved in the progression of chronic kidney disease.Despite treatment with renin angiotensin system inhibition, kidney function declines in many patients.
Aldosterone excess is a risk factor for progression of kidney disease. Hyperkalaemia is a concern with the use of mineralocorticoid receptor antagonists. We aimed to determine whether the renal protective benefits of mineralocorticoid antagonists outweigh the risk of hyperkalaemia associated with this treatment in patientswith chronic kidney disease.

Methods: We conducted a meta-analysis investigating renoprotective effects and risk of hyperkalaemia in trials of mineralocorticoid receptor antagonists in chronic kidney disease. Trials were identified from MEDLINE (1966–2014), EMBASE (1947–2014) and the Cochrane Clinical Trials Database. Unpublished summary data were obtained from investigators. We included randomised controlled trials, and the first period of randomised cross over trials lasting ≥4 weeks in adults.

Results: Nineteen trials (21 study groups, 1 646 patients) were included. In random effects meta-analysis, addition of mineralocorticoid receptor antagonists to renin angiotensin system inhibition resulted in a reduction from baseline in systolic blood pressure (−5.7 [−9.0, −2.3] mmHg), diastolic blood pressure (−1.7 [−3.4, −0.1] mmHg) and glomerular filtration rate (−3.2 [−5.4, −1.0] mL/min/1.73 m^2). Mineralocorticoid receptor antagonism reduced weighted mean protein/albumin excretion by 38.7 % but with a threefold higher relative risk of withdrawing from the trial due tohyperkalaemia (3.21, [1.19, 8.71]). Death, cardiovascular events and hard renal end points were not reported in sufficient numbers to analyse.

Conclusions: Mineralocorticoid receptor antagonism reduces blood pressure and urinary protein/albumin excretionwith a quantifiable risk of hyperkalaemia above predefined study upper limit.

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