

# Review: Medical treatment and revascularization may be similar in atherosclerotic renal artery stenosis

Balk E, Raman G, Chung M, et al. Effectiveness of management strategies for renal artery stenosis: a systematic review. *Ann Intern Med.* 2006;145:901-12.

**Clinical impact ratings:** Nephrology ★★★★★☆

## QUESTION

In patients with atherosclerotic renal artery stenosis (RAS), how does medical treatment compare with revascularization for mortality and cardiovascular events?

## METHODS

**Data sources:** MEDLINE (to September 2005), reference lists of related studies and reviews, and experts in the field.

**Study selection and assessment:** English-language studies of adult patients with RAS that reported mortality rate, kidney function, blood pressure (BP), or cardiovascular events at  $\geq 6$  months. Eligible study designs varied according to interventions and included direct-comparison studies with medical treatment and angioplasty or surgery. Exclusion criteria included previous surgery or angioplasty for RAS and RAS with nonatherosclerotic causes in  $> 20\%$  of patients. 3 randomized controlled trials (RCTs) (medical treatment vs angioplasty without stent placement, 2 RCTs [ $n = 103$ ]; medical treatment vs surgical revascularization, 1 RCT [ $n = 52$ ]), 7 comparative studies, and 46 cohort studies

met the selection criteria. Predefined criteria were used to grade study quality as good, fair, or poor; applicability as high, moderate, or low; and strength of evidence as robust, acceptable, or weak. None was of high quality.

**Outcomes:** Mortality rate, kidney function, BP, cardiovascular events, and adverse events.

## MAIN RESULTS

None of the RCTs showed a difference between medical treatment and angioplasty without stent placement or surgical revascularization in kidney function or cardiovascular events. The RCTs were too small to detect differences in mortality rates. Among 22 cohort studies of angioplasty assessing kidney function, 2 showed improvement, 2 showed deterioration, and 18 showed no changes. Within these studies, kidney function improved in 8% to 51% and deteriorated in up to 31% of patients. Among 3 surgical cohort studies, kidney function improved in 43% of patients (1 study) and worsened in 10% to 28% of patients. Angioplasty with-

out stent placement led to a net reduction in diastolic BP of 6 mm Hg compared with medical treatment in 1 RCT ( $n = 48$ ) and a net reduction in BP of 26/10 mm Hg in patients with bilateral disease in another RCT ( $n = 55$ ). Cohort studies reported decreases in systolic BP of 20 to 50 mm Hg and in diastolic BP of 8 to 42 mm Hg with medical treatment, while angioplasty with stent placement led to decreases of 6 to 32 mm Hg and 0 to 17 mm Hg, respectively. Rates of adverse events between interventions could not be compared.

## CONCLUSION

In patients with atherosclerotic renal artery stenosis, limited evidence comparing medical treatment with angioplasty or surgical revascularization is available and does not support 1 approach over the others.

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## COMMENTARY

The main conclusion from the systematic review by Balk and colleagues is that insufficient evidence exists to support the choice of angioplasty or surgical revascularization over medical treatment in patients with atherosclerotic RAS. Furthermore, one should realize that only a few RCTs are available, and the conclusions rest mainly on observational studies. Most studies were of poor quality, and many did not report the degree of stenosis or the glomerular filtration rate. Inasmuch as the degree of stenosis was known, this was generally  $> 60\%$  or even  $70\%$  with a mean serum creatinine level  $> 125 \mu\text{mol/L}$  ( $1.4 \text{ mg/dL}$ ). In other words, the patients were likely to have had advanced disease, and no major improvement with either therapy could have been expected in the first place. This evidence, however, is valid only for those patients fulfilling the selection criteria in the studies that were included in the analysis: It is not justified to apply the results of the systematic review to patients with lesser degrees of stenosis or with better renal function. In these patients, even less evidence regarding benefits and harms is available.

Another limitation is that not all patients who were selected for therapy went through the same diagnostic protocol, which may have

led to unbalanced patient groups and bias in the results. In many cases, it is unclear whether RAS was the primary abnormality or simply the manifestation of complicated hypertensive disease.

The excellent overview by Balk and colleagues painfully shows how poor our knowledge is about atherosclerotic RAS. We urgently need RCTs comparing medical treatment with other treatments (including surgery) not only in the type of patients that were included in earlier studies and will be included in the CORAL (Cardiovascular Outcomes with Renal Atherosclerotic Lesions) trial (patients with systolic BP  $> 155 \text{ mm Hg}$  on  $\geq 2$  medications and creatinine level  $< 265 \mu\text{mol/L}$  [ $3 \text{ mg/dL}$ ]) (1) but also in patients in whom the atherosclerotic process is less advanced.

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## Reference

- Cooper CJ, Murphy TP, Matsumoto A, et al. Stent revascularization for the prevention of cardiovascular and renal events among patients with renal artery stenosis and systolic hypertension: rationale and design of the CORAL trial. *Am Heart J.* 2006;152:59-66.