

Diabetic nephropathy

Michael Shlipak

- Interventions
- Key points
- About this condition
- Updates (22)
- Guidelines (6)
- References
- Your responses

Type 1 diabetes and early nephropathy

ACE inhibitors in early nephropathy

In this section:

[Summary](#) | [Benefits](#) | [Harms](#) | [Comment](#)

[Top](#)

Summary

Progression to late nephropathy

Compared with placebo ACE inhibitors (captopril, lisinopril, enalapril, perindopril, and ramipril) reduce progression to macroalbuminuria and increase regression to normoalbuminuria in normotensive people with type 1 diabetes and microalbuminuria compared with placebo ([high-quality evidence](#)).

Note

We found no clinically important results about ACE inhibitors compared with angiotensin II receptor antagonists, or about the effects of combined ACE inhibitors plus angiotensin II receptor antagonists, in people with type 1 diabetes and early nephropathy.

For GRADE evaluation of interventions for diabetic nephropathy, [see table](#).

[Top](#)

Benefits

ACE inhibitors versus placebo:

We found one systematic review (search date not reported), which found that, compared with placebo, ACE inhibitors significantly reduced progression to late nephropathy and increased regression to normoalbuminuria in normotensive people with type 1 diabetes and microalbuminuria (individual patient data meta-analysis from 12 trials; 698 people; progression to macroalbuminuria: OR 0.38, 95% CI 0.25 to 0.57; $P < 0.001$; regression to normoalbuminuria: OR 3.07, 95% CI 2.15 to 4.44). [\[20\]](#) The included ACE inhibitors were captopril, lisinopril, enalapril, perindopril, and ramipril.

ACE inhibitors versus angiotensin II receptor antagonists:

We found no systematic review or RCTs.

ACE inhibitors plus angiotensin II receptor antagonists:

We found no systematic review or RCTs.

[Top](#)

Harms

ACE inhibitors versus placebo:

The review gave no information on adverse effects of ACE inhibitors in people with type 1 diabetes and microalbuminuria. [\[20\]](#)

ACE inhibitors versus angiotensin II receptor antagonists:

We found no RCTs.

ACE inhibitors plus angiotensin II receptor antagonists:

We found no RCTs.

[Top](#)

Comment

Clinical guide:

Most people with type 1 diabetes and early nephropathy should be offered initial treatment with an ACE inhibitor at a low dose, and then titrated to the maximum tolerated dose. Kidney function should be monitored during initiation of treatment and dose escalation. One expert recommends continuing the ACE inhibitor (or angiotensin II receptor antagonist), unless the serum creatinine increases by more than 30%; greater increases could lead to renal arterial stenosis. [\[21\]](#)

References

20. ACE Inhibitors in Diabetic Nephropathy Trialist Group. Should all patients with type 1 diabetes mellitus and microalbuminuria receive angiotensin-converting enzyme inhibitors? A meta-analysis of individual patient data [comment]. *Ann Intern Med* 2001;134:370–379. Search date not reported; primary source Medline. [\[PubMed\]](#)
21. Bakris GL. A practical approach to achieving recommended blood pressure goals in diabetic patients. *Arch Intern Med* 2001;161:2661–2667. [\[PubMed\]](#)