FPIN's Clinical Inquiries

Alpha Blockers for Nephrolithiasis

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Clinical Question

How effectively do alpha blockers increase ureteral stone passage?

Evidence-Based Answer

The alpha blocker tamsulosin (Flomax) can be used to improve clearance of stones larger than 5 mm, shorten expulsion times, and reduce hospitalization. (Strength of Recommendation: B, based on meta-analyses of moderate-quality randomized controlled trials.) Alfuzosin (Uroxatral), doxazosin (Cardura), and silodosin (Rapaflo) are also effective but have significantly more adverse effects.

Summary

A 2018 Cochrane review compared alpha blockers with placebo or standard therapy for urinary stone expulsion.[1] The five highest-quality placebo-controlled studies with the lowest risk of bias found a benefit. A subgroup analysis of 15 moderate-quality randomized controlled trials identified significant differences based on stone size. When all of the alpha blocker vs. placebo studies were included (seven studies; N = 3,240), there were fewer days to stone clearance when alpha blockers were used (mean difference [MD] = –1.98 days; 95% CI, –3.71 to –0.24). When individual studies reported results for stones 6 to 10 mm, the decreased time to clearance was even better (four studies; n = 1,884; MD = –5.99 days; 95% CI, –7.16 to –4.82). Improvement in time to stone clearance was not statistically significant when the three highest-quality studies (n = 2,891) were included (MD = –1.72; 95% CI, –5.13 to 1.68). Moderate-quality evidence showed fewer hospitalizations in patients who were treated with alpha blockers (13 studies; n = 1,876; relative risk [RR] = 0.51; 95% CI, 0.34 to 0.77). However, there was some risk of bias, and limiting the analysis to the highest-quality studies found no statistical difference (one study; n = 403; RR = 0.87; 95% CI, 0.49 to 1.52). There was no subgroup analysis of hospitalization rate based on stone size.

The studies that evaluated tamsulosin did not find any increase in adverse effects (13 studies; n = 2,062; RR = 1.24; 95% CI, 0.62 to 2.47). Three other alpha blockers (alfuzosin, doxazosin, silodosin) had statistically increased rates of adverse effects. Major adverse effects (orthostatic hypotension, collapse, syncope, tachycardia, or palpitations) were not significantly increased in the 18 studies reporting them (n = 3,124; RR = 1.25; 95% CI, 0.80 to 1.96). However, among the placebo-controlled studies, adverse effects were increased (10 studies; n = 1,650; RR = 2.09; 95% CI, 1.13 to 3.86).

A high-quality, double-blind, placebo-controlled trial published after the Cochrane review found no improvement in stone passage rates when alpha blockers were used.[2] The passage rate for tamsulosin was 50% compared with ▶

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47% for the placebo group (RR = 1.05; 95.8% CI, 0.87 to 1.27; P = .60). This study included 512 patients with a mean age of 40.6 years; 27.1% were female. It evaluated symptomatic patients who presented to the emergency department with urinary stones of 9 mm or less identified by computed tomography. Patients were randomized to a 28-day regimen of 0.4-mg tamsulosin or a placebo. The passage of a ureteral stone was determined by the patient's visualization or physical capture of the stone. Most of the identified stones were less than 5 mm (379 stones were 1 to 4 mm; 133 stones were 5 to 8 mm; and no stones were larger than 8 mm). A subgroup analysis did not find any difference based on stone size, but the analysis was underpowered. There were no differences in adverse effects between the two groups, and no serious adverse events were reported.

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References

1. Campschroer T, Zhu X, Vernooij RW, et al. Alpha-blockers as medical expulsive therapy for ureteral stones. *Cochrane Database Syst Rev*. 2018;(4):CD008509.
2. Meltzer AC, Burrows PK, Wolfson AB, et al. Effect of tamsulosin on passage of symptomatic ureteral stones: a randomized clinical trial. *JAMA Intern Med*. 2018;178(8):1051-1057. ■