Tamsulosin for ureteral stones: a systematic review and meta-analysis of a randomized controlled trial


CRD summary
The authors concluded that tamsulosin was safe and effective for the expulsion of ureteral stones of less than 10mm. Publication bias, limited reporting of trial quality, significant statistical and clinical variations, and the potential overstatement of the findings due to double counting of participants (acknowledged by the authors), mean that these conclusions seem unlikely to be reliable.

Authors' objectives
To evaluate the effectiveness of tamsulosin for ureteral stones.

Searching
PubMed, EMBASE, The Cochrane Library, Science Citation Index, and CBM were searched up to December 2011, without language restriction; search terms were reported. Unpublished studies were not sought. Experts on ureteral stones were contacted and reference lists of identified studies were examined.

Study selection
Randomised or quasi-randomised controlled trials were eligible if patients received either tamsulosin or standard therapy (including antispasmodic, sedative or antibiotic therapy), with or without placebo, for ureteral stones. Trials of tamsulosin with extracorporeal shock wave lithotripsy or with ureteroscopy, were excluded.

The included trials were of tamsulosin 0.2mg or 0.4mg daily. The size of the ureteral stones ranged from 3mm to 18mm, where reported. Some trials were of tamsulosin alone versus control and other treatments, while others were of a combination of tamsulosin with standard therapy versus control. Standard therapies included diclofenac, hydration, cotrimoxazole, ibuprofen, and ketorolac.

Two reviewers independently screened the title and abstract of those studies identified by the searches.

Assessment of study quality
The quality of the included trials was assessed using the Jadad scale, with a maximum score of 5. Three reviewers independently evaluated trial quality.

Data extraction
Data were extracted to calculate weighted mean differences and relative risks, with their 95% confidence intervals. Two reviewers independently extracted the data. Any disagreements were resolved by consultation with a third reviewer.

Methods of synthesis
Pooled weighted mean differences for continuous data, and relative risks for dichotomous data, with their corresponding 95% confidence intervals, were calculated using a fixed-effect model where there was no evidence of heterogeneity; otherwise a random-effects model was used. Heterogeneity was assessed using $\chi^2$ and $I^2$. Where heterogeneity was detected, a sensitivity analysis was performed to explore the reliability of the results. Publication bias was assessed in funnel plots.

Results of the review
Twenty-nine trials (2,763 patients) were included in the review. Methodological quality ranged from 1 to 7 on the Jadad scale, even though the maximum on the scale was 5. Follow-up ranged from eight days to six weeks, where reported.

There was a statistically significant overall benefit, for stone expulsion rate, with tamsulosin compared with control (RR 1.33, 95% CI 1.23 to 1.44; $I^2$=66%; 40 comparisons). The funnel plot suggested the presence of publication bias. The pooled results showed that with tamsulosin 0.4mg (but not 0.2mg) the expulsion time was shorter than control with...
The pooled weighted mean difference showed that the number of pain episodes was significantly lower with tamsulosin than with control (WMD -0.44, 95% CI -0.76 to -0.12; I²=63%; eight trials). A few adverse effects were observed in patients treated with tamsulosin. The results of the subgroup analyses were reported.

Authors’ conclusions
Tamsulosin was safe and effective for the expulsion of distal ureteral stones of less than 10mm, but high-quality multicentre, randomised, placebo-controlled trials were needed.

CRD commentary
The review addressed a clear question and was supported by appropriate inclusion criteria. The search covered a range of relevant sources, with no language restrictions, which reduced the risk of language bias. The authors did not search for the unpublished studies, and the funnel plot suggested that publication bias was possible. Appropriate methods to reduce reviewer error and bias were used throughout the review. The quality of the included trials was assessed and the scores, but not the full results were reported. The methods of allocation concealment were not assessed, which makes it difficult to interpret the reliability of the findings.

Appropriate methods were used to pool the data, but in the primary analysis, single intervention arms were used more than once for multiple comparisons from individual trials, which may have underestimated the variability (confidence interval) for the pooled estimate. There were high levels of statistical heterogeneity, which were not adequately explored in the sensitivity analyses. The table and figures were difficult to interpret due to missing information, such as the dose, and errors, such as Jadad scores greater than 5.

Publication bias, the limited reporting of trial quality, the presence of significant statistical and clinical variations, and the potential overstatement of the findings due to double counting of participants, which was acknowledged by the authors, mean that their conclusions seem unlikely to be reliable.

Implications of the review for practice and research
Practice: The authors stated that tamsulosin should be recommended as the first treatment for most patients with distal ureteral stones of less than 10mm.

Research: The authors stated that high-quality multicentre, randomised, placebo-controlled trials, with a large numbers of patients, were needed. These trials should assess the impact of geographical differences, such as European versus Asian populations.

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