

Clinical Pearls

University of Colorado Hospital Pharmacy

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Pesky Kidney Stones

Both nifedipine and tamsulosin therapy have been successfully studied in ureteral stones to help facilitate stone passage, and both agents are being ordered by our physicians at UCH for such conditions. The use of pharmacologic agents for ureteral stones can help keep the costs associated with other invasive and expensive treatment modalities down. So, how do these drugs work?

Nifedipine has been shown to decrease spontaneous contractions of the ureter by blocking the calcium influx needed for smooth muscle contraction. Similarly, tamsulosin's antagonism of $\alpha 1$ -receptors has been shown to relax ureteral smooth muscle, and since there is a high density of $\alpha 1$ -receptors in the ureter, results have been favorable.

In available trials, typical stone size was less than 15 mm, and effective daily dosages were nifedipine extended release 30 mg or tamsulosin 0.4 mg. The maximal duration of therapy looked at in the trials was 28 – 45 days.

Here is a summary of some of the available trial data:

- The average rate of ureteral stone passage was 35 – 70% in control groups versus 77 – 80% in patients treated with nifedipine and 79 – 100% in patients treated with tamsulosin.
- The average time to stone passage was 4 – 20 days in control groups versus 5 – 9 days in patients treated with nifedipine and 3 – 8 days in patients treated with tamsulosin.
- Hospitalization rates were significantly reduced from 9 – 34% in control groups to 0 – 20% in patients receiving nifedipine or tamsulosin therapy.

There appears to be good evidence for using nifedipine and tamsulosin in ureteral stones, but there is also room for more studies to be done to identify which patients in terms of stone size, stone location, and degree of obstruction are most likely to benefit from this type of therapy.

For more information, check out the following references:

Beach MA, Mauro LS. Pharmacologic expulsive treatment of ureteral calculi. *Ann Pharmacother* 2006; 40:1361-8.

Singh A, Alter HJ, Littlepage A. A systematic review of medical therapy to facilitate passage of ureteral calculi. *Ann Emerg Med* 2007; 50(5):552-63.

Curhan GC, Aronson MD, Preminger GM. Up-To-Date: Diagnosis and acute management of suspected nephrolithiasis in adults. Cited 01.02.2008.

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