TAKE-HOME MESSAGE
For patients presenting with acute renal colic, treatment with nonsteroidal anti-inflammatory drugs offers effective pain relief with fewer adverse effects than opioids or paracetamol.

Are Nonsteroidal Anti-inflammatory Drugs Safe and Effective for Treatment of Acute Renal Colic?

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Results
A total of 36 randomized controlled trials (including 4,887 patients) from 16 countries were included in this systematic review and meta-analysis. Outcomes for reduction in pain at 30 minutes found that nonsteroidal anti-inflammatory drugs had benefit over opioids (mean difference -5.58 on a 100-point scale; 95% confidence interval [CI] -10.22 to -0.95); however, there was substantial heterogeneity across studies ($I^2=81$%), and subgroup analysis could not identify the source of the variability. The quality of evidence varied across outcomes and was deemed low quality for pain variance, complete or greater than or equal to 50% reduction in pain at 30 minutes, and need for rescue analgesia with nonsteroidal anti-inflammatory drugs.

Commentary
It is estimated that 1.3 million people present to emergency departments (EDs) each year for visits relating to kidney stone disease. Approximately 90% of stones less than 5 mm will pass spontaneously, making medical management an important treatment for this disease process. Patients with acute renal colic present to the ED with the main expectation of pain relief. Patient length of stay depends on the time necessary to obtain symptom control because the majority of patients...
these patients (80%) will ultimately be discharged from the ED. The main factors when an analgesia treatment is chosen are safety and efficacy.

This systematic review and meta-analysis addresses the optimal analgesic treatment for acute renal colic. The meta-analysis demonstrated no difference in initial pain control between nonsteroidal anti-inflammatory drugs and opioids (risk ratio 0.96; 95% CI 0.82 to 1.11). However, the data showed consistent treatment benefit for nonsteroidal anti-inflammatory drugs (requiring fewer rescue analgesic treatments), especially when given intravenously. The systematic review also reported that patients treated with nonsteroidal anti-inflammatory drugs were less likely to have an adverse event—specifically, fewer episodes of vomiting—compared with those treated with opioids.

Because nausea and vomiting are part of the classic presentation of acute renal colic, the decreased rate of vomiting with nonsteroidal anti-inflammatory drugs is an important consideration. Outcomes examining the safety and efficacy between nonsteroidal anti-inflammatory drugs and paracetamol in renal colic found no difference between pain relief at 30 minutes or adverse events. However, nonsteroidal anti-inflammatory drugs had fewer requirements for rescue analgesia compared with paracetamol (risk ratio 0.56; 95% CI 0.42 to 0.74).

Although not addressed in the systematic review, emergency medicine clinicians need to consider the potential for adverse events when using nonsteroidal anti-inflammatory drugs for acute renal colic in certain patient populations; nonsteroidal anti-inflammatory drugs should be avoided in patients with poor renal function or in those having risk factors for decreased renal function.

In summary, for emergency physicians treating acute renal colic, nonsteroidal anti-inflammatory drugs should be considered first-line treatment because they offer effective pain relief with fewer adverse effects and less need for rescue analgesia compared with opioids or paracetamol. These findings are important in the context of the national opioid epidemic, declared a public health emergency in 2017, in which physicians are charged to advance better practices in pain management.

Editor’s Note: This is a clinical synopsis, a regular feature of the *Annals’* Systematic Review Snapshots (SRS) series. The source for this systematic review snapshot is: Pathan SA, Mitra B, Cameron PA. *A systematic review and meta-analysis comparing the efficacy of nonsteroidal anti-inflammatory drugs, opioids, and paracetamol in the treatment of acute renal colic.* *Eur Urol.* 2018;73:583-595.


Michael Brown, MD, MSc, Jestin N. Carlson, MD, MS, and Alan Jones, MD, serve as editors of the SRS series.