

THERAPEUTICS

# Review: Nonsteroidal antiinflammatory drugs provide better pain relief than do opioids for acute renal colic

Holdgate A, Pollock T. Systematic review of the relative efficacy of non-steroidal anti-inflammatory drugs and opioids in the treatment of acute renal colic. *BMJ*. 2004; 328:1401-8.

**QUESTION**

What are the relative benefits and disadvantages of nonsteroidal antiinflammatory drugs (NSAIDs) and opioids for management of pain in acute renal colic?

**METHODS**

**Data sources:** Cochrane Renal Group specialized register; Cochrane central register of controlled trials (2003); MEDLINE and PreMEDLINE (1966 to January 2003); EMBASE/Excerpta Medica (1980 to January 2003); reference lists of nephrology textbooks, review articles, and relevant trials; and abstracts of nephrology conference proceedings.

**Study selection and assessment:** Published and unpublished randomized controlled trials (RCTs) in any language that compared an NSAID with an opioid administered by any route in adults with a clinical diagnosis of acute renal colic and that assessed  $\geq 1$  of the outcomes listed below. 2 reviewers independently assessed individual study quality based on concealment of allocation, intention-to-treat analysis, completeness of follow-up, and blinding.

**Outcomes:** Patient-rated pain on a validated pain scale, time to pain relief, need for rescue analgesia, rate of pain recurrence, and major

(gastrointestinal bleeding, renal failure, hypotension, and respiratory depression) or minor adverse events (vomiting, diarrhea, pain, dizziness, and sleepiness).

**MAIN RESULTS**

20 RCTs ( $n = 1613$ ) met the selection criteria. NSAIDs assessed were indomethacin, diclofenac, ketorolac, tenoxicam, and indoprofen, and opioids assessed were pethidine (meperidine), morphine, Spasmodifen, oxycodone, pentazocine, Ketogan, and tramadol. Most drugs were administered intravenously or intramuscularly. No trials reported time to pain relief, rates of pain recurrence, or specific serious adverse events.

Results of meta-analyses are reported based on a random-effects model. Meta-analysis of 6 RCTs (not assessing ketorolac) found that patients who received NSAIDs had lower patient-rated pain on visual ana-

logue scales than did those who received opioids (weighted mean difference  $-4.60$  mm, 95% CI  $-7.5$  to  $-1.7$ ). Inclusion of trials using ketorolac showed a similar effect. NSAIDs and opioids did not differ for failure to achieve complete pain relief. Patients who received NSAIDs were less likely to require rescue analgesia than were those who received opioids (Table) and less likely to report vomiting (Table).

**CONCLUSION**

In patients with acute renal colic, non-steroidal antiinflammatory drugs reduce pain scores and need for rescue analgesics more than opioids and are associated with less vomiting.

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**Nonsteroidal antiinflammatory drugs (NSAIDs) vs opioids for acute renal colic\***

Outcomes	Number of trials (n)	NSAIDs	Opioids	RRR (95% CI)	NNT (CI)
Failure to achieve complete pain relief at 30 or 60 min	9 (674)	47%	52%	13% (-3 to 26)	Not significant
Required rescue analgesia within 4 h	10 (854)	19%	25%	25% (7 to 29)	16 (11 to 58)
Vomiting at $\leq 24$ h	10 (825)	5.8%	19%	65% (47 to 77)	8 (7 to 11)

\*Abbreviations defined in Glossary; NNTs and CIs calculated from control event rates and relative risks reported in article.

**COMMENTARY**

Renal colic is considered to be one of the most painful acute conditions presenting to acute care settings. Although narcotics are widely used for various painful conditions, NSAIDs are a logical treatment option for renal colic because of their ability to decrease intrarenal pressure and prevent ureteral spasm (1). The well-done meta-analysis by Holdgate and Pollock provides further evidence for the use of NSAIDs. The authors clearly defined the objectives of the review and set criteria for selecting studies before doing a comprehensive search for relevant articles. They wanted to include studies of patients with a clinical diagnosis of renal colic; however, most of the identified studies included only patients with confirmed renal colic.

Although the included studies compared various NSAIDs and narcotics (usually a fixed dose of both drugs) and reported various outcomes, the authors were able to pool the results for several outcomes. Overall, NSAIDs appeared to be slightly more effective in relieving pain than narcotics, although the difference between the 2 treatments was unlikely to be clinically significant. The incidence of vomiting was significantly lower in patients treated with NSAIDs.

Clinically, patients present to acute care settings with undifferentiated abdominal pain that may or may not be renal colic. They need rapid

pain relief, which often includes an NSAID combined with a titrated dose of narcotic. The adverse effects of a single dose of an NSAID in patients with undifferentiated abdominal pain are probably minimal, but direct studies of this effect are lacking. When prescribing, clinicians should take into account the likelihood of alternative diagnoses. The presence of preexisting renal insufficiency would contraindicate the use of NSAIDs in this setting. The review by Holdgate and Pollock suggests that NSAIDs are probably the best first choice as a single agent for less severe cases and provides some evidence for their safety in renal colic. However, combining an NSAID with a titrated dose of narcotic should still be considered for patients with substantial pain, although direct evidence of this effect is lacking. Furthermore, the authors did not examine the effectiveness of adding an antiemetic to a narcotic to prevent vomiting.

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**Reference**

1. Teichman JM. Clinical practice. Acute renal colic from ureteral calculus. *N Engl J Med*. 2004;350:684-93.