NSAIDs, Cats, & Anesthesia: Are the Kidneys at Risk?

Berit Fischer, DVM, DACVAA, CCRP
Crown Veterinary Specialists & Associates
Lebanon, New Jersey

In the literature

Kongara K, Cave N, Weidgraaf K, Dukkipati VSR. Effect of non-steroidal anti-inflammatory drugs on glomerular filtration rate and urinary N-acetyl-β-D-glucosaminidase activity in cats after dental surgery. *Vet Anaesth Analg*. 2020;47(5):631-636.

FROM THE PAGE …

Although NSAIDs can alleviate postoperative pain in healthy cats, potential adverse effects on kidney perfusion often discourage use of these drugs in analgesic protocols.

Most clinically available biochemical tests lack the sensitivity to detect early kidney damage, making it difficult to identify direct cause-and-effect relationships. In research settings, measurement of glomerular filtration rate (GFR) is an effective but time-consuming method to detect acute kidney injury (AKI).[1] N-acetyl-β-D-glucosaminidase (NAG) is a novel, highly specific urine biomarker for renal damage that is predictive of AKI in humans and has been shown to rapidly increase in cats and dogs receiving nephrotoxic drugs.[2]

In this clinical trial, healthy cats were administered carprofen ($n = 8$), meloxicam ($n = 8$), or saline ($n = 8$) SC at the time of preanesthetic medication prior to routine dental prophylaxis. GFR was measured in all 3 groups, and urinary NAG activity was measured in the meloxicam and saline groups 4 hours before and 24 hours after the dental prophylaxis. The goal was to determine whether NSAIDs produced changes in GFR and NAG indicative of AKI. Results demonstrated no significant differences in GFR among the 3 groups or in NAG between the meloxicam and saline groups at either time point. The authors concluded that preanesthetic administration of carprofen or meloxicam did not result in appreciable renal dysfunction in healthy, normotensive cats during the trial period.

It is important to note that NSAID-associated AKI is rarely caused by direct nephrotoxic effects. Rather, it is related to the kidneys inability to increase renal perfusion via prostaglandin-mediated vasodilation in times of hemodynamic instability (eg, hypotension).[3] Because no cats in the trial had mean arterial blood pressure below that expected to stimulate prostaglandin release, NSAID-related renal damage was not anticipated.

… TO YOUR PATIENTS

Key pearls to put into practice:

1. Based on this trial, preanesthetic administration of carprofen to healthy, normotensive cats is not associated with changes in GFR that might indicate the presence of renal tubular damage. Preanesthetic administration of meloxicam to healthy, normotensive cats is also not associated with changes in GFR or NAG that might indicate the presence of renal tubular damage.
2. Hypotension is a common and not always predictable complication of anesthesia. The mechanism of NSAID-associated AKI suggests that administration before anesthesia in hypotensive patients may leave the kidney vulnerable.
3. Until further studies elucidate risk in anesthetized, hemodynamically compromised patients, cautious use of preanesthetic administration of NSAIDS in cats is recommended.

References

1. Clark-Price SC, Grauer GF. Physiology, pathophysiology, and anesthetic management of patients with renal disease. In: Grimm KA, Lamont LA, Tranquilli WJ, Greene SA, Robertson SA, eds. *Veterinary Anesthesia and Analgesia. The Fifth Edition of Lumb and Jones.* Wiley-Blackwell; 2015:681-697.
2. Hokamp JA, Nabity MB. Renal biomarkers in domestic species. *Vet Clin Pathol*. 2016;45(1):28-56.
3. Baker M, Perazella MA. NSAIDs in CKD: Are they safe? *Am J Kidney Dis*. 2020;76(4):546-557.