Analgesic Considerations in Cats

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- The pharmacokinetic and pharmacodynamic effects of anesthetic and analgesic drugs differ between dogs and cats. Cats are NOT small dogs.
- Unfortunately, analgesic options for feline patients are limited compared with analgesic options for canine patients.

Important points regarding feline patients

- Due to feline aloof behavior, it can be difficult for clients to notice subtle changes with their cat's health. Cats typically do not show obvious signs of pain; instead, they become withdrawn and hide.
- Generally speaking, feline responses to anesthetic and analgesic drugs are unpredictable compared with canine responses.

Physiology of nociception and feline pain

- Transduction: Mechanical, chemical, or thermal injury is converted to an electrical impulse by Aβ (quick pain) and C nociceptors (slow pain).
- Transmission: The noxious electrical impulse is transmitted from the periphery to the spinal cord via Aβ and C sensory neurons. The synapse between the sensory neurons and the spinal cord occurs at lamina II (substantia gelatinosa) in the dorsal spinal horn.
- Primary (spinal) modulation: Within the spinal cord the afferent, noxious sensory impulse undergoes initial analysis. The spinal cord upgrades or downgrades the severity of the noxious stimulus and communicates that information to the brain. An unconscious reflex arc is the result of primary (spinal) modulation.
- Projection: After primary modulation, the noxious information is then projected to the brain via several tracts: two examples are the spinocervicothalamic (fast pain) and spinoreticular (slow pain) tracts.
- Secondary (cerebral) modulation: Within the conscious brain noxious afferent input is perceived as pain. Unconsciousness (anesthesia) blunts, or abolishes, secondary nociceptive modulation.
- Providing analgesics before surgery is called pre-emptive analgesia. Studies have shown that preemptive analgesia significantly decreases the likelihood of hypersensitiity associated with surgical pain.
- Preventive analgesia is term that describes a comprehensive pain control plan which includes pre-, intra- and postoperative therapies. Preventive analgesia has been well established in human medicine but not yet in veterinary medicine.
- The Brondani multi- dimensional composite feline pain scale was recently validated for the English language. Before the Brondani feline pain scale there was no validated pain scale for cats.
- Pain is not always considered a major component of many feline diseases. Saddle thrombosis, for example, is a clinical condition secondary to feline cardiac disease and causes extensive, acute ischemic muscle pain. Regardless of the disease, pain evaluation, and therapy, should always be part of the clinical plan.
- Identifying pain in cats can be difficult. Cats do not outwardly express pain. Sometimes an owner noticing a change in his or her cat's behavior is the only indication of discomfort. Clinical signs of acute pain in cats include a tucked or crouched posture, reluctance to move, ears facing forward, focused eyes, lip licking, guarding, and purring.

Analgesic options for feline patients

- Opioids are considered the backbone of analgesia in both human and veterinary medicine. Mu agonist opioids have been known to cause opioid-related hysteria (dysphorea) and hyperthermia in cats. Although both conditions merit concern their clinical relevance is questionable and both can be reversed using naloxone. Morphine and hydromorphone are mu agonist opioids that are most likely to cause side effects in cats whereas oxymorphone, methadone, and fentanyl are the least likely.
- Butorphanol is a mu antagonist, kappa agonist opioid and has good effects in cats; however, its duration of action is only 30 45 minutes.
- Buprenorphine is a partial mu agonist opioid and, in cats, provides excellent analgesia for up to 6 to 8 hours in cats.
- Alpha 2 agonists provide both sedation and analgesia. Dexmedetomidine is an excellent major tranquilizer for cats because it provides predictable results, good analgesia, can be combined with other drugs, and is the choice tranquilizer for cats with hypertrophic cardiomyopathy (HCM).

- Dissociative NMDA antagonists (ketamine, tiletamine) also provide consistent sedation and analgesia in cats; however, this family of major tranquilizers is contra-indicated in cats with HCM.
- NSAIDs are good analgesic choices in healthy cats. It is recommended practitioners administer these drugs judiciously, monitor their patients closely, and communicate to their clients regarding potential adverse side effects from NSAIDs.
- In addition to parenteral analgesics, locoregional techniques can be extremely valuable when used for pain management in cats. Examples of common locoregional procedures in cats include nerve blocks of the mouth and eyes, brachial plexus blocks, forepaw and rear-paw ring blocks, and lumbosacral and caudal epidurals.

References

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