

Update on butorphanol tartrate: use in small animals

Doris H. Dyson

Butorphanol tartrate is a synthetic morphinan possessing properties common to opiate analgesics (meperidine, morphine, oxymorphone), but having some antagonistic properties resulting in its classification as an agonist-antagonist similar to pentazocine and nalbuphine. It is presently licenced in Canada for use as a sedative/analgesic in horses (10 mg/mL) (Torbugesic, Austin Laboratories Canada, Guelph, Ontario). Butorphanol is 115 times as effective at cough suppression as codeine or dextromethorphan (1). It has also been formulated into tablets (Torbutrol, Austin Laboratories Canada, Guelph, Ontario), and licenced for use in dogs as an antitussive.

Research has been carried out on the effect of butorphanol on pain thresholds in the dog and cat (2-4). Due to the antagonist properties of this drug, a ceiling effect on analgesia is produced as the dose is increased (5). Duration of analgesia may be shortened with high dosages. Butorphanol appears to be an effective alternative to oxymorphone for postoperative analgesia following orthopedic procedures, thoracotomy, or abdominal surgery. Duration of effect may be less than with oxymorphone and can vary between two and five hours.

Analgesia Dose: Dog 0.2-0.4 mg/kg IM or IV
Cat 0.1-0.2 mg/kg IM or IV,
0.4 mg/kg subcutaneously

Higher doses are required for somatic analgesia compared with visceral analgesia. Somatic analgesia has been shown to occur in the cat at 0.8 mg/kg subcutaneously, but mild apprehension can be associated with this dose. Respiratory depression was shown to occur with butorphanol at the recommended dosage for postoperative analgesia as observed with most opiates (6). Although carbon dioxide levels were increased from control, oxygenation was not adversely affected. Panting has been reported. Intravenous dosage has no risk of histamine release, as is associated with meperidine or morphine administration (7).

Butorphanol can be used for premedication before general anesthesia. Both sedation and the reduction in barbiturate requirement for induction are dose-related, but similar to acepromazine premedication (8).

Premedication Dose: Dog/Cat 0.1-0.2 mg/kg IM

Respiratory depression is comparable to other opiates used in small animals, and a fall in heart rate, less than that observed following morphine, can occur (6). Reduction in blood pressure and a transient fall in cardiac output occur in combination with an inhalant anesthetic, and therefore the concentration of inhalant should be adjusted to maintain cardiovascular stability. Butorphanol may be chosen as a premedication in the American Society of Anesthesiologists classification 1 and 2 animals (healthy, mildly or moderately diseased) with preoperative pain or for procedures associated with significant pain intraoperatively and postoperatively (e.g. Zepp, pelvic fracture repair). Its antitussive properties make it a suitable premedication for the brachycephalic patient, enabling longer acceptance of an endotracheal tube in recovery.

Neuroleptanalgesia incorporating butorphanol produces acceptable restraint in the dog for minor diagnostic procedures (e.g. radiography) and surgical procedures. It is important to leave the animal undisturbed for at least 5 min before starting the manipulations to ensure full sedation. Butorphanol/acepromazine is comparable to oxymorphone/acepromazine in dosage required, sedation achieved, and duration of effect.

Neuroleptanalgesia Dose:

Butorphanol 0.2 mg/kg IV
Acepromazine 0.05 mg/kg IV
Atropine 0.02 mg/kg IV

The three drugs can be safely mixed in one syringe for administration. Reversal of sedation can be achieved with the use of naloxone. This combination used in the cat will produce a tractable animal, but does not produce the degree of sedation observed in the dog.

A maximum dosage for butorphanol has not been reported. For most drugs, as the weight of the animal increases, the dose/kg decreases. We feel that this is the case with butorphanol, based on clinical evidence, and suggest a maximum dose.

Suggested Maximum Dose: Dog 5 mg

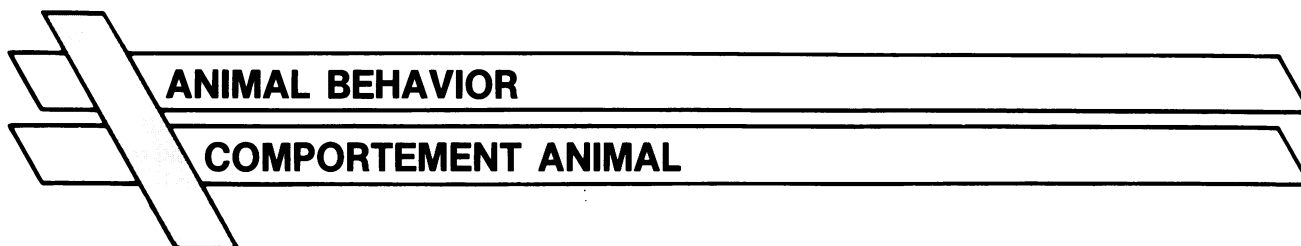
Butorphanol has been examined in the dog for its opiate antagonist properties (9). It was found to reduce sedation produced following oxymorphone administration. It appears to be similar to levallorphan pro-

ducing partial reversal with some residual sedation and ataxia. Naloxone remains the drug of choice for reversal of any opiate. A dose of 0.4 mg/kg butorphanol IV (without a maximum dose restriction) may be considered to produce partial reversal of oxymorphone in dogs. It is not recommended for reversal of Innovar due to the shorter duration of effect of fentanyl. Reversal of analgesia has not been examined in the dog. Dogs premedicated with oxymorphone have been given butorphanol for post-operative analgesia 2-4 h later, and antagonism of the analgesic effect was not apparent clinically.

In conclusion, butorphanol may prove to be a useful agent for supplementation of small animal anesthesia.

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A veterinarian's guide to the correction of dominance aggression

Prognosis for successful correction:

When dominance is strongly inherited, or when the owner is unable or unwilling to follow the necessary course of correction, the dominance may be difficult or impossible to fully resolve. For example, the chances of completely correcting a one-year-old dominant-aggressive Springer Spaniel or a 10-year-old arthritic dominant Beagle are guarded at best, and potentially dangerous. On the other hand, a seven-year-old Golden Retriever that is just beginning to display dominance aggression would have a more favorable prognosis.

Treatment

Rather than explore individual case histories, it is more practical to discuss the seven correction techniques that are utilized to correct dominance aggression. The appropriate techniques for an individual case must be carefully chosen on the basis of the history, duration, age, breed, environment and degree of danger to the owners.

Gary Landsberg, Doncaster Animal Clinic, 99 Henderson Avenue, Thornhill, Ontario L3T 2K9.

1. Dominant attitude: The owner must be boss!

Dogs speak "dog language". They establish and maintain their dominance over other members of the pack by their attitude, facial expressions, body postures, and vocalizations. When dominant displays are directed toward members of the family, the dog has become boss ("alpha") over those family members. Examples of dominance displays were discussed in the last issue of this column. To establish dominance, the owner must use a tone of voice, actions, expressions and attitudes that say to the dog "I'm the boss". Begin by having the owners teach the dog that they will not be pushed around. Whenever the dog demands or asks for anything (attention, affection, play, treats, etc.) the owner must *never* give in. This would just reward the pushy, dominant behavior. Instead the owner must teach the dog that it is no longer the boss, and that "nothing in life is free" (1). Whenever the dog attempts to push the owner around, the owner should "turn the tables" on the dog and make the dog perform an obedience command such as down-stay, or one of the physical handling exercises listed below. Once the dog submits to the command or