

Butorphanol Tartate

Esther van Praag, Ph.D.

This is a synthetic morphinan analgesic with narcotic agonist-antagonist activity. It is commonly used pre-, intra- and post-operatively, as it increases the well-being of an animal-patient after a painful operation. It exerts analgesic effects via the CNS (central nervous system), by acting on the μ -receptors, which results in analgesia, respiratory depression, miosis and a feeling of well-being. Stimulation of the κ -receptors by butorphanol results in analgesia and sedation, with only a slight effect on the cardiovascular system. The analgesia provided by this drug is thus characterized by fewer adverse reactions than other opioids.

Its effect is immediate after IV injection, while it becomes effective after about 30 min with SC administration. Its half-life elimination is 1.64 h and 3.16 h after IV and SC injection respectively.

Highest levels are found in the liver, kidney and intestine, but the drug also concentrates in the lungs, heart, fat tissues and blood cells. Degradation of butorphanol through hydroxylation, N-dealkylation and conjugation takes place in the liver. This drug should thus be avoided in patients with heart, liver and/or renal insufficiency.

It passes the placenta barrier and is distributed into maternal milk.

In some species, butorphanol has shown antitussive effects.

Adverse Effects

Known side effects are occasional lack of appetite, more rarely sedation, vomiting, or diarrhea. Generally, it must be used with caution in older or debilitated animals. In horses, higher dosages may lead to nystagmus, seizures or decreased GI motility, or induce CNS excitement, resulting in increased ambulation, tossing/jerking of the head, etc. In one case, a rabbit is reported to have exhibited overly self-confident behavior after intake of butorphanol.

Treatment should not go beyond 7-8 days. Prolonged use may lead to physical dependence or a decrease in response to the prescribed dose.



In case this drug is administered concurrently with other CNS depressants (alcohol, analgesic agents, antihistamines, barbiturates, phenothiazine tranquilizers), the dosage of butorphanol needs to be reconsidered and may need to be decreased; concurrent administration can lead to additive CNS and/or respiratory depression. One manufacturer (Fort Dodge, USA) specifically says about the use of this drug in rodents and rabbits: "It is undesirable to administer any other sedative or analgesic drugs during treatment with Torbutrol [= butorphanol] as these are likely to produce additive effects."

Dosage

Morphasol	(Dr. E. Gräub, CH)	susp	0.1-0.5 mg/kg q 2-4 h; IV, SC
Torbugesic	(Fort Dodge, USA)	susp	0.1-0.5 mg/kg q 2-4 h; IV, SC
Torbutrol	(Fort Dodge, USA)	tab	0.1-0.5 mg/kg q 8-12 h ; PO
Stadol NS	(Bristol-Myers Squibb, USA)	susp	10mg/ml bottle

Further Information

1. Allen DG, Pringle JK, D. A. Smith DA. Handbook of Veterinary Drugs, 2nd edition. Lippincott-Raven, pp. 103, 448, 630, 1998.
2. Flecknell PA, Liles JH, Wootton R. Reversal of fentanyl/fluanisone neuroleptanalgesia in the rabbit using mixed agonist/antagonist opioids. Lab Anim. 1989; 23(2):147-55.
3. Fujibayashi K, Sakamoto K, Watanabe M, Iizuka Y. Pharmacological properties of R-84760, a novel kappa-opioid receptor agonist. Eur J Pharmacol. 1994; 261(1-2):133-40.
4. Gades NM, Danneman PJ, Wixson SK, Tolley EA. The magnitude and duration of the analgesic effect of morphine, butorphanol, and buprenorphine in rats and mice. Contemp Top Lab Anim Sci. 2000; 39(2):8-13.
5. Gomaa AA, Mohammed LH, Ahmed HN, Farghaly AM. Interaction of butorphanol, with monoamine oxidase inhibitor, tranylcypromine. Forensic Sci Int. 1991; 49(2):185-92.
6. Hayes A, Kelly A. Profile of activity of kappa receptor agonists in the rabbit vas deferens. Eur J Pharmacol. 1985; 110(3):317-22.
7. Horiuchi T, Komatsu T, Yasuhara M, Uchida M. [The effect of extradurally administered analgesics on somatosensory evoked eyelid microvibration in rabbits] Masui. 1991; 40(7):1113-22. Japanese.
8. Hubbell JA, Muir WW. Evaluation of a survey of the diplomates of the American College of Laboratory Animal Medicine on use of analgesic agents in animals used in biomedical research. J Am Vet Med Assoc. 1996; 209(5):918-21.
9. Marini RP, Avison DL, Corning BF, Lipman NS. Ketamine/xylazine/butorphanol: a new anesthetic combination for rabbits. Lab Anim Sci. 1992; 42(1):57-62.
10. Mathews KA, Pettifer G, Foster R, McDonell W. Safety and efficacy of preoperative administration of meloxicam, compared with that of ketoprofen



and butorphanol in dogs undergoing abdominal surgery. Am J Vet Res. 2001; 62(6):882-8.

11. Natalini CC, Robinson EP. Evaluation of the analgesic effects of epidurally administered morphine, alfentanil, butorphanol, tramadol, and U50488H in horses. Am J Vet Res. 2000; 61(12):1579-86.
12. Ohta S, Niwa M, Nozaki M, Hattori M, Shimonaka H, Dohi S. [The mu, delta and kappa properties of various opioids] Masui. 1995; 44(9):1228-32. Japanese.
13. Ohya M, Taguchi H, Mima M, Koumoto K, Fukae T, Uchida M. [Effects of morphine, buprenorphine and butorphanol on airway dynamics of the rabbit] Masui. 1993; 42(4):498-503. Japanese.
14. Portnoy LG, Hustead DR. Pharmacokinetics of butorphanol tartrate in rabbits. Am J Vet Res. 1992; 53(4):541-3.

The information and pictures on these pages may not be reproduced, or republished on another webpage, website, or elsewhere.

SEPTEMBER 2003

