ANALGESIC EFFECT OF PREMEDICATION WITH TRAMADOL OR BUTORPHANOL IN DOGS UNDERGOING OSTEOSYNTHESIS

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Summary

The research was carried on 17 adult dogs underwent osteosynthesis. In the anesthetic premedication were included butorphanol + acepromazine + ketamine (group B) or tramadol + acepromazine + ketamine (group T). Induction and maintenance of anesthesia was the same for both groups. Post-operative analgesia was assessed using a dynamic interactive visual analogue scale. Rescue analgesia was provided with butorphanol or tramadol. Orthopedic procedures cause severe and prolonged pain and to provide an adequate level of comfort more rescue analgesia were necessary to dogs in group B compared with dogs in group T.

Key words: analgesia, butorphanol, tramadol, osteosynthesis, dog.

Providing analgesia in orthopaedic intervention is a constant and important concern, having a direct reflection on postoperative evolution. Arrangements for obtaining it are numerous and are based on many types of pharmacological agents. Tramadol is a centrally acting analgesic, and is increasingly used for analgesia in dogs. It has only recently gained significant attention as an analgesic in dogs despite its having been used in humans in Germany since 1977 and in North America since the mid 1980's (2). Butorphanol is frequently used to provide analgesia in small animal practice, but the results regarding the efficacy of pain control are different (3).

The purpose of this study was to determine the effect of premedication with tramadol or butorphanol on post-operative pain following osteosynthesis in dogs.

Materials and methods

Seventeen adult dogs (11 male, 6 female, mean age 4 years, mean body weight 16 kg) underwent surgery for repair of different fractures. They were randomly assigned to one group receiving different premedication:

- butorphanol (0,4 mg/kg, IV) + acepromazine (0,03 mg/kg, IV) + ketamine (10 mg/kg IV) (group B), and
- tramadol (4 mg/kg IV) + acepromazine + ketamine (group T).

Premedication drugs and antibiotics were administered 30 minutes before anesthesia induction. Anesthesia was induced in all dogs using propofol (2-5 mg/kg

IV) and maintained after endotracheal intubation with 2% isoflurane in oxygen (1 L/min).

Patients were observed and the level of analgesia was measured subjectively, with other words the discomfort was assessed using a dynamic and interactive visual analogue scale (DIVAS, 0 to 100 mm) (0 = no pain, 100 = maximum pain). A blinded evaluator assessed the dogs before premedication (baseline), and again at 2, 3, 4, 5, 6, 8, 10 and 24 hours after extubation. Rescue analgesia was provided when DIVAS was greater than 50 mm. It was administered the dose used in premedication for first rescue analgesia, and if a second rescue analgesia was required the dose was the same.

Times to administration of first rescue analgesia, total number of rescue analgesic interventions required to achieve adequate comfort for each dog were recorded and DIVAS were compared using T-test. Significance was set at $p<0.05$. Data are reported as mean ± SD.

Results and discussions

Only one animal did not require rescue analgesia in group B (n=9) and only three animals required rescue analgesia in group T (n=8) (fig. 1 and 2). A second rescue analgesia required one animal in group B. First rescue analgesia was administrated after two hours after the end of surgery in group B, and after three hours in group T. From analyze of data results that to provide an adequate level of comfort more rescue analgesia were necessary to dogs in group B, 9, compared with dogs in group T, 3.

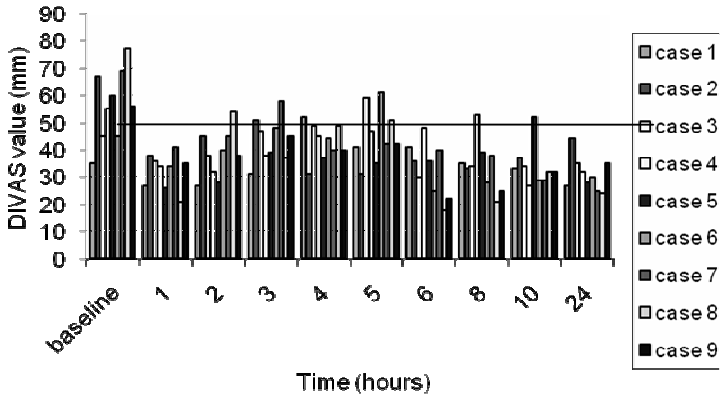


Fig. 1. DIVAS values in group B (n=9)

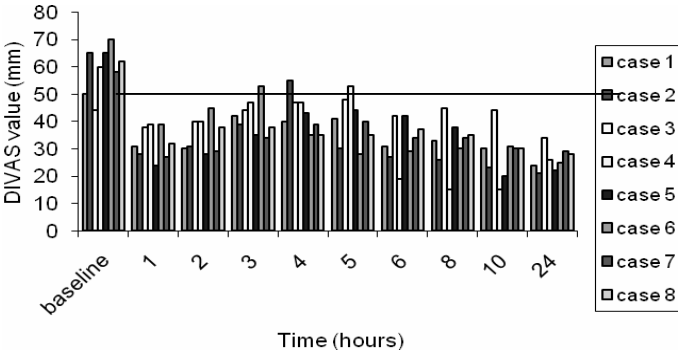


Fig. 2. DIVAS values in group T (n=8)

DIVAS values did not differed significantly between treatments with the exception of last evaluation made at 24 hours when in group T values were significantly lower (p=0,038). DIVAS values did differed significantly over time, between 5 and 6 hours (p=0,008 group B, p=0,0499 group T) after surgery, correlated with the decrease of pain intensity after six hours.

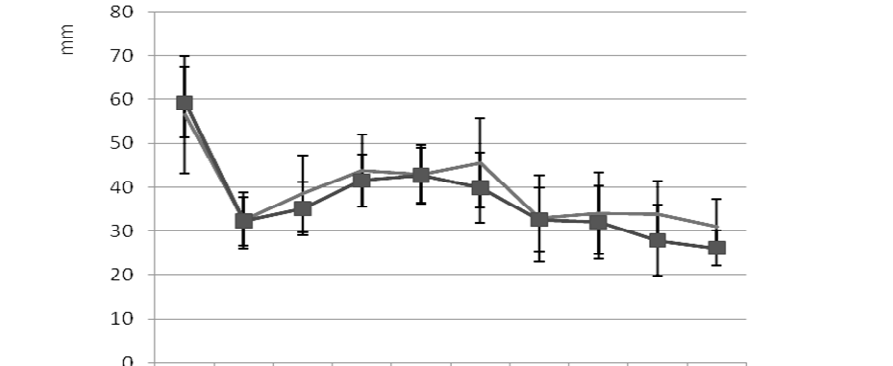
After surgery mean DIVAS limits were 45,44+/-10,12 and 31,11+/-6,25 in group B and 42,62+/-6,40 and 26,12+/-3,91 in group T (fig. 3). These values correlated with number of rescue analgesia indicate a superior analgesic effect when tramadol was used.

The level of pain associated with surgery can be anticipated, orthopedic procedures cause severe and prolonged pain, but fortunately there are a great number of available options for acute pain relief in dogs. To optimize pain management we chose a preoperative approach using tramadol and butorphanol in premedication.

Tramadol is a centrally acting analgesic that interacts with many different receptors, opioids, serotonin, and adrenergic (2). The recommended dosage in dogs is 1 to 2mg/kg every 12 hours but doses up to 5mg/kg and dosing intervals as short as every 6 hours have been used when necessary in dogs without major reported adverse effects (5). The present study confirm the efficacy of tramadol in providing postoperative analgesia without side effects when it was used in premedication and repeated in a dose of 4 mg/kg. In conditions of an acute pain resulting after orthopedic surgery a good analgesic effect was registered on 62,4% of patients in which was not necessary a rescue analgesia.

Butorphanol has analgesic properties acting on kappa opioid receptors. It is considered a potent analgesic agent but there are reported limits to the

effectiveness on somatic analgesia in dog (4). The present study confirm its analgesic effect, DIVAS values did not differed significantly between treatments groups, but relatively short lasting, for maximum two hours in most dogs, 88,8% of them requiring a rescue analgesia showing us that a single dose of butorphanol will not provide adequate post-operative analgesia. Noticed differences between treatments groups and inside the group regarding the necessity of rescue analgesia can be explained by unique response of each individual to injury and surgical treatment and by individual variations in response to drugs that target different opioid receptors (1).



	baseline	1	2	3	4	5	6	8	10	24
group B	56,6	32,4	38,6	43,8	43	45,4	32,9	34	33,9	31,1
group T	59,3	32,3	35,1	41,5	42,6	39,9	32,6	32	27,9	26,1

Fig.3. DIVAS values (mean) recorded during surveillance time in group B and group T

Conclusions

Osteosynthesis is it a painful procedure which needs a complex analgesic protocol with appropriately supplementation in post-operative period.

At the used dose, the effect of tramadol is more intense and long lasting than that of butorphanol.

Acknowledgments

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