

EPIDURAL DELIVERY OF LIDOCAINE AND TRAMADOL TO CONTROL PAIN DURING OVARIOHISTERECTOMY IN THE BITCH

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Abstract

Epidural anesthesia is a simple, safe and effective way to administer anesthetic and analgesic drugs for caudal abdominal surgeries in canines. The aim of the study was to compare the analgesic effect of lidocaine or lidocaine-tramadol association administered epidurally during ovariohysterectomy in the bitch. 14 bitches, ASA status 2 to 4, were premedicated with midazolam 0,2 mg/kg, butorphanol 0,2 mg/kg, induced with propofol 5 mg/kg iv and maintained with isoflurane. For 7 bitches lidocaine 2 mg/kg was administered epidurally (L batch), while for the other 7 lidocaine was associated v:v with tramadol (LT batch). Analgesia was monitored intraoperatory (pulse frequency, non invasive blood pressure, muscle relaxation) and postoperatory for the first 4 hours using the Glasgow pain scale. Blood pressure remained constant for both groups. There was a deduction of volatile agents in both groups, the bitches being extubated soon after stopping the delivery of anesthetic gas. Glasgow pain score was higher for the L batch (10) ompared to the LT batch (5), showing a higher analgesic capacity for the lidocaine-tramadol association. There were no complications, adverse effects or technique related difficulties for the epidural anesthesia in the bitches included in this study. In conclusion, the association between lidocaine and tramadol for epidural anesthesia represents an efective, cheap and simple alternative for analgesia during ovariohysterectomy in the bitch.

Key words: lidocaine, tramadol, bitch, epidural anesthesia

INTRODUCTION

Research on pain concept and the importance of its alleviation brought regional anesthesia in plane sight, in order to complete general anesthesia. Regional anesthesia presents many advantages: is less aggressive than general anesthesia, especially towards the cardio-vascular system and is cheap, with an easy technique. Epidural anesthesia is recommended in bitches for C-section because it does not negatively affect the puppies, while the mother stays awake and can take care of the newborns immediately after the intervention (Tranquilli et al., 2007). It is also recommended for interventions on the genital area or for orthopedics surgeries (Jones, 2001; Pohl et al., 2012; Sarotti et al., 2014).

Epidural anesthesia requires administration of local anesthetic substances outside dura mater at the sacro-lombar space (Gregori et al., 2014). In dogs it has been reported a maximal spread of anesthetic blockade until to fourth or sixth lumbar vertebra following lumbosacral extradural lidocaine which is

usually unsatisfactory for ovariohysterectomy, because the ovarian pedicle is innervated by third and fourth lumbar afferent nerves. Thus, some studies have proposed the extradural administration of an opioide in combination with lidocaine in an attempt to spread the sensory blockade, optimizing the anesthesia to lower abdominal surgical procedures in dogs (Cruz et al., 1997; Diniz et al., 2013; Gasparini et al., 2007; Saritas et al., 2014).

In dogs, reported adverse effects following epidural anaesthesia include delayed hair re-growth in 11%, urinary retention in 3–44% and pruritus affecting the lumbosacral area, with an incidence of < 2% (Campoy et al., 2012; Kalchofner Guerrero et al., 2014).

The purpose of this study was to compare the analgesic effect of simple lidocaine and of a lidocaine-tramadol mixture administered epidurally during ovariohysterectomy in bitches. Also, we assumed that epidural anesthesia will reduce the requirement of inhalatory agent, reducing the cardio-respiratory depression and leading to a faster recovery.

MATERIALS AND METHODS

14 client-owned bitches undergoing surgery of the genital apparatus and classified as ASA (American Society of Anesthesiologists) category II to IV were included.

Dogs were assigned to one of the two treatment groups by block randomization: group L (n = 7) received an epidural injection of lidocaine 2 mg/kg and group LT (n = 7) received epidural lidocaine associated v:v with tramadol, not exceeding 6 ml per bitch.

Dogs were fasted for 10–12 hours before surgery. On the day of surgery an intravenous catheter was placed and dogs were premedicated with midazolam 0,2 mg/kg and butorphanol 0,2 mg/kg intravenously (IV). Ten minutes later, anaesthesia was induced with propofol 5 mg/kg IV to effect. Following endotracheal intubation, anaesthesia was maintained with isoflurane. Lactated Ringer's solution (LRS) 5 ml/kg was administered to all dogs during the procedure.

The lumbosacral area was clipped and surgically prepared with povidone-iodine solution. Epidural anaesthesia was performed with the dog placed in sternal recumbency and fully extended hind limbs. A 21 gauge spinal needle was introduced in the lumbo-sacral space (figure 1). Correct needle placement was confirmed by the hanging drop test. Analgesia was monitored intraoperatory (pulse frequency, non invasive blood pressure, muscle relaxation) and postoperatory for the first 4 hours using the Glasgow Composite Pain Scale (Holton et al., 2001; Murrell et al., 2008). Maximum Glasgow pain score that can be obtained is 20. Administration of an analgesic is recommended for all the Glasgow scores above 5.

Statistical analysis was performed using a commercial software (Statview® 5.1, Software SAS Inc. Cary). Significance was identified at $p < 0.05$. Data are expressed as mean \pm standard deviation (SD).

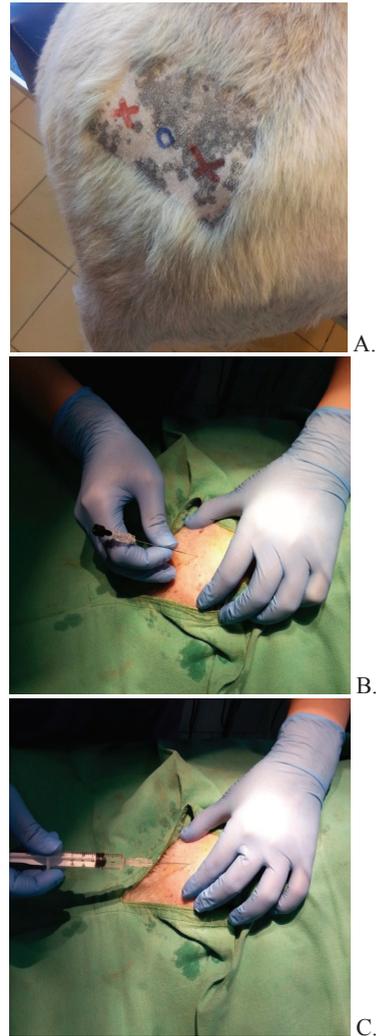


Figure 1. Identification of the lumbo-sacral space (A) and epidural administration of anesthetic agents (B and C).

RESULTS AND DISCUSSIONS

14 bitches were neutered in the Clinic of Obstetric and Gynecology of the Faculty of Veterinary Medicine of Bucharest due to different affections (figure 2). The age of the bitches varied between 1,5 and 17 years, with a mean age of 8,7 years (table 1).

Table 1. Distribution of breeds and age of the bitches in the experimental groups.

Nr.	Breed	Age (years)	Weight (kg)
1.	Mioritic romanian shepherd	9	47
2.	Caucasian shepherd	1,5	60
3.	Poodle	17	10
4.	Cane Corso	2	49
5.	Siberian husky	12	36
6.	Pekinese	11	6,1
7.	Labrador	7	27
8.	American Staffordshire Terrier	3	22
9.	Mix breed	1,5	36
10.	Mix breed	12	6
11.	Mix breed	15	13,6
12.	Mix breed	15	7,5
13.	Mix breed	7	4,5
14.	Mix breed	9	14

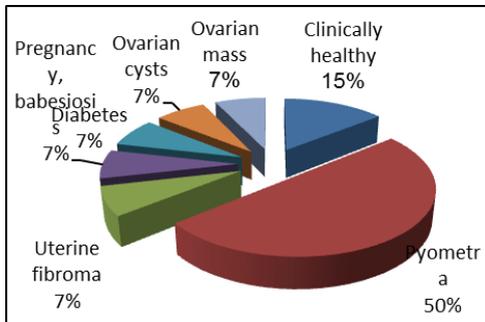


Figure 2. Distribution of affections in the experimental group.

The mean time duration from epidural anesthesia administration to sitting position was 35 minutes for the L group. For the LT group, after surgery, the bitches did not move their tale or hind limbs, the anus was relaxed, showing the persistence of epidural anesthesia. Sitting position was adopted in 50 minutes since the administration of lidocaine-tramadol. The mixture of lidocaine with tramadol prolonged the anesthetic effect of lidocaine with 15 minutes.

Blood pressure was relatively constant throughout the surgical procedure. Hypotension was noted in just one case during the postop time and it could be related to the epidural anesthesia.

Mean Glasgow score for the L group was 5,28 compared to 3,71 for the LT group. Rescue analgesia was required for 2 bitches (28,57%) in the L group. This shows a superior analgesic effect for the lidocaine-tramadol mixture compared to simple lidocaine.

Extubation time after ceasement of the inhalatory agent varied between 3 and 15 minutes for the L group and 2 – 15 minutes for the LT group. There is no significant difference between the two groups regarding extubation time.

There were no complications, adverse effects or technique related difficulties for the epidural anesthesia in the bitches included in this study.

CONCLUSIONS

Blood pressure was not significantly influenced by the type of substance administered epidurally.

The lidocaine-tramadol mixture ensured a longer and more powerful anesthetic and analgesic effect compared to single lidocaine.

Epidural anesthesia reduced the requirement of volatile agents for maintenance of anesthesia, allowing a faster extubation.

In conclusion, the association between lidocaine and tramadol for epidural anesthesia represents an effective, cheap and simple alternative for analgesia during ovariohysterectomy in the bitch.

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