

## **Post-surgical perineural analgesic assessment of the combination between bupivacaine and dexamethasone in dogs undergoing orthopedic surgery of the pelvic limb**

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The use of locoregional anesthesia in patients undergoing orthopedic surgery has become more common in the past years. Studies in rats showed that the addition of dexamethasone in perineural blocks prolongs the duration of the local anesthetic (An *et al*, 2015). The use of this combination in humans undergoing orthopedic surgery, has shown a prolongation of the analgesic effect significantly.

A retrospective study was performed in which 36 patients qualified. The inclusion criteria used was: dogs, patients ASA I and II, patients undergoing unilateral orthopedic surgery such as tibial-plateau-leveling osteotomy (TPLO), tibial tuberosity advancement (TTA), tibial plate placement for fracture repairs, extracapsular lateral suture stabilization, femur and tibia fracture repair.

The pain assessment was assessed using the pain scale of Glasgow University and the Pain Scale of the University of Melbourne. As premedication the dogs received ketamine 0.25mg/kg IV, midazolam 0.1mg/kg IV, meloxicam (0,1 mg/kg IV according to the case), and propofol 4mg/kg IV. Three ultrasound guided nerve blocks were preformed using a nerve stimulator. Bupivacaine 0.5% 0.1ml/kg and dexamethasone 0.4mg/ml of the calculated bupivacaine was injected. The sciatic nerve was blocked by a parasacral approach. The femoral nerve was blocked by a lateral pre-iliac approach and the lateral femoral nerve was also blocked.

The results obtained were maintained during the 24 hours of the study; using the pain scale of the University of Glasgow the minimum score obtained was 2 and the maximum was 5. The minimum and maximum score using the scale of the University of Melbourne was 2 and 4 respectively; therefore none of the patients required any analgesic rescue. The pain measurement was performed 2,4,6,8,10,12,18 and 24 hours post-surgery by the same operator. No statistically significant difference was found in the pain assessment between the different types of orthopedic surgeries over time (p value > 0.05), with either pain scales.

*Choi et al*,(2014) showed that the addition of dexamethasone to a local anesthetic of medium duration, can prolong the anesthetic effect up to 3 hours. On the other hand, if it is used with a long-acting amide, the blockage of the nerves can last 10 hours or more. *Cummings et al* (2011) demonstrated in 182 patients, that went trough shoulder surgery, that dexamethasone potency 0.44 times the effect of bupivacaine. A study conducted in humans by *Fredrickson et al* (2013), showed that the addition of dexamethasone to the local anesthetic increased the analgesia time in a 13% in the first 24 hours and no adverse effects or toxicity were reported.

The interaction of dexamethasone with amides is still under study, since the specific mechanism of the interaction is unknown. One of the theories about the interaction of the two drugs is that dexamethasone causes a level of vasoconstriction in the area where it is administered, therefore, the absorption of the local anesthetic is limited, which leads to a longer duration of the effect (*Cummings et al*, 2011). On the other hand, *Attardi et al* (1993) & *Viera et al* (2010) propose that dexamethasone increases the activity of the potassium inhibitors channels in the nociceptive C fibers, decreasing the activity of these and therefore the response to different stimuli.

In conclusion, the association of bupivacaine and dexamethasone provides a prolonged analgesia over time, independently of the orthopedic procedure performed.