

## **Pre-emptive multimodal analgesia with tramadol and ketamine–lidocaine infusion for suppression of central sensitization in a dog model of ovariohysterectomy**

### **ABSTRACT**

**Objectives:** The effects of pre-emptive infusion of ketamine-lidocaine with tramadol on the suppression of central sensitization were investigated in a dog ovariohysterectomy model. **Patients and methods:** Twelve dogs were randomly assigned to two groups: ketamine-lidocaine-tramadol (KLT) and tramadol (T) groups. Both groups received intravenous tramadol 4 mg/kg body weight as premedication. Immediately after induction, the KLT group received ketamine and lidocaine at 0.5 and 2 mg/kg loading dose, followed by continuous rate infusion of 50 and 100 µg/kg/min, respectively, for 2 hours. Dogs in T group received saline bolus and continuous rate infusion at equi-volume. Intraoperatively, hemodynamic responses to surgical stimulation were recorded, whereas postoperative pain was evaluated using an algometer and short form of the Glasgow composite measure pain scale. **Results:** Intraoperatively, hemodynamic responses to surgical stimulation were obtunded to a greater degree in KLT compared to T group. Postoperatively, the pain scores increased only for the first hour in KLT group, compared to 12 hours in T group. Mechanical thresholds at the abdomen decreased postoperatively between 12 and 60 hours in KLT group versus the entire 72 hours in T group. Thresholds at tibia and radius in both groups increased in the immediate 1 hour postoperatively, but decreased thereafter. Significant decrement of thresholds from baseline were detected in the tibia at 24, 42, and 60 hours in KLT group compared to 24-72 hours in T group, and in the radius between 36 and 48 hours in T group, but none in KLT group. **Conclusion:** Addition of pre-emptive ketamine-lidocaine infusion to single intravenous dose of tramadol enhanced attenuation of central sensitization and improved intra- and postoperative analgesia.

**Keyword:** Central sensitization; Ketamine; Lidocaine; Postoperative pain; Pre-emptive multimodal analgesia; Tramadol