

Effect of epidural tramadol and lignocaine on physiological and behavioural changes in goats subjected to castration with a high tension band

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Abstract

AIM: To compare the effect of a single epidural injection of either lignocaine or tramadol on behavioural changes, anaesthetic indices, leucocyte parameters, erythrocyte sedimentation rates and concentration of cortisol in plasma in goats subjected to castration by high tension band.

METHODS: Ten male goats weighing 14.4 (SD 0.7) kg were randomly allocated to anaesthesia with epidural injections of tramadol (3 mg/kg), or lignocaine (4 mg/kg). Following anaesthesia, a rubber ring was applied and tensioned to the scrotal neck of each goat. Behavioural changes were noted as they occurred, and the onset of drug action (time between epidural injection and loss of pedal reflex) and duration of antinociception (time interval between disappearance and reappearance of pedal withdrawal reflex) were determined. Heart rates, respiratory rates and rectal temperatures were determined every 15 minutes for a 90-minute period, while blood was obtained for determination of white cell counts, erythrocyte sedimentation rates and concentrations of cortisol. Anaesthetic indices were compared using Student's t-test, while physiological parameters were compared using an ANOVA for repeated measurements.

RESULTS: Goats treated with epidural tramadol were not recumbent and continued rumination while goats treated with epidural lignocaine were recumbent and did not continue rumination. The onset of analgesia was longer ($p=0.01$) in goats treated with epidural tramadol (5.0 minutes; SD 1.2) than goats treated with epidural lignocaine (3.0 minutes; SD 1.1), while duration of analgesia was shorter ($p=0.003$) in goats treated with epidural tramadol (47.2 minutes; SD 13.1) than goats treated with epidural lignocaine (89.8 minutes; SD 23.1). There was no significant difference in heart rates, respiratory rates and erythrocyte sedimentation rates, while the concentration of cortisol in plasma differed ($p<0.05$) between goats treated with epidural tramadol and lignocaine.

CONCLUSIONS: Epidural lignocaine injection produced longer duration of antinociception with lower frequency of pain-associated behavioural changes; while treatment with epidural tramadol injection allowed the goats to continue grazing once the rubber ring has been applied.

CLINICAL RELEVANCE: Epidural tramadol produced partial pain relief, while epidural lignocaine injection provided the most effective pain control. However, epidural tramadol has an advantage over epidural lignocaine in conditions such as perineal surgery and caesarian section in cattle and where the ability of the animal to maintain standing is desired.

Keywords: Epidural, lignocaine, tramadol, castration, goats, anaesthesia
