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## The effect of verapamil hydrochloride on cardiac rhythm and frequency of arrhythmias in domestic donkey

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Verapamil is a calcium channel blocker (CCB) that blocks long-lasting calcium channels, resulting in depression of cardiac and vascular function that depends on calcium influx. Verapamil inhibits calcium influx across the cell membrane of the SA and AV nodes. This study was conducted on 10 non-pregnant domestic female donkeys a base-apex lead was used for recording ECG for diagnosing arrhythmias. Sinus arrest (2cases), bradycardia (1case) and wandering pacemaker (1case) were diagnosed before the experiment. Verapamil was injected at the dosage of 0.3 mg/kgBW as an intravenous bolus over 2 minutes. ECG was taken during and at 0, 20, 30, 40, 50, and 60 minutes after injection. Sinus tachycardia was observed in 8 cases during drug injection and limited to one case at 20 and 30 minutes after injection. Wandering pacemaker was seen in one case, 20 minutes after Verapamil injection and disappeared 50 minutes after injection. Bradycardia disappeared during drug injection and reappeared at the minute 10 and remained until the end of experiment. First degree AV block was observed in two cases at the time of drug injection and was observed in only one case 10 minutes after injection. Second degree AV block was recorded in one case at the time of Verapamil injection and was remained stable to the final stage.

**Keywords:** Verapamil, Domestic donkey, Arrhythmia, Calcium channel blocker, ECG

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## Analgesic effect of caudal epidural ketamine in goat

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Ketamine is a dissociative anesthetic agent. It has proved to be an effective analgesic drug in human and some animals when given oral, intramuscularly, intravenously or by epidural route. This study was performed to clarify the analgesic effect of ketamine injected into the lumbosacral epidural space in goats. Eight native adult goats (4 male and 4 female) were randomly received 3 treatments at least 1 week interval: 4, 6 and 8 mg/kg of ketamine. Sedation and ataxia in animals and analgesia of tail, anus, perineum, femoral region, gluteal region, flank and external genitalia were assessed every 5 minute and heart rate, respiratory rate and rectal body temperature were assessed before ketamine administration and until 120 minute. The onset of tail relaxation was recorded as the first sign of anesthesia which was less than 1 minute in 6 and 8 mg of ketamine in 8 goats, but was noticed only in 6 goats in 4 mg/kg of ketamine and its mean was about 3 minutes. The tail, anus, perineum, lateral and medial area of femoral region, gluteal region, hindlimb were anesthetized in all animals after using 6 and 8 mg/kg of ketamine. The external genitalia including vulva and mammary gland in female goats and testis in male animals were also anesthetized. The analgesia of hindlimb and perineum were not obtained in all animals after using of 4 mg/kg ketamine. The duration of analgesia was significantly ( $P<0.05$ ) increased according to the dosage of ketamine. The mean of duration of analgesia in perineum was about 14 minute for 4 mg/kg, 30 min for 6 mg/kg and 65 minute for 8 mg/kg of ketamine. All animals became recumbent in group 6 and 8 mg/kg. There were minimal effects on heart and respiratory rates and temperature. The present study showed that caudal epidural ketamine administration induced analgesia with some degree of sedation and sever ataxia and recumbency in goats. The duration of analgesia after 6 and 8 mg/kg of ketamine administration is long enough for common surgical procedure of perineum.

**Keywords:** ketamine, epidural, goat, analgesia, perineum