



76° CONVEGNO SISVET

BARI, 21-22-23 GIUGNO 2023

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IL CODICE ISBN ASSOCIATO AGLI ATTI DEL 75° CONVEGNO SISVET È

978-88-909092-5-2



INJECTABLE ANESTHESIA WITH KETAMINE, MEDETOMIDINE, AND BUTORPHANOL IN RATS

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Ketamine, medetomidine, and butorphanol can be used to obtain sedation or anesthesia in rats, either as sole agents or in combination with other drugs [1]. However, the commonly used dosages in intraperitoneal administration are high and can produce cardiorespiratory depression and slow recovery [2]. The aim of this work is to evaluate the effects of the intramuscular administration of a cocktail of lower dosages of these drugs, followed by atipamezole, in rats. The trial included 28 Sprague-Dawley rats of 3 months of age and mean weight of 316.5 ± 27.6 g, undergoing laparotomy and, after 14 days, euthanasia as part of an experimental project. Rats received ketamine, medetomidine, and butorphanol (KMB: 30, 0.1, and 1 mg/kg, respectively) into the thigh muscles. Anesthesia was carried out twice in all subjects (laparotomy and euthanasia). For both procedures induction time, times of loss of palpebral and pedal reflexes, heart, and respiratory rate (HR, RR), peripheral saturation (SpO₂) and need of isoflurane were evaluated. 5 minutes after the injection, depth of anesthesia was evaluated using scores (final score range: 0-16) reported for rats [3]. Each animal was given oxygen through a face mask, and isoflurane was delivered in case of need. After the surgical procedure, atipamezole (0.5 mg/kg, IM) and carprofen (5 mg/kg, SC) were administered and times of reappearance of palpebral and pedal reflexes, head lifting time, recovery time were evaluated. Results (mean \pm SD): induction time was 3.1 ± 1.6 min, times of loss of palpebral and pedal reflexes were both 3.5 ± 2.0 min. Final score for depth of anesthesia was 15.1 ± 0.7 . Times of reappearance of palpebral and pedal reflexes were 1.7 ± 0.7 min and 1.5 ± 0.6 min, respectively; head lifting, and recovery times were both 3.6 ± 1.0 min. All recoveries were smooth, with no complications. For all measures, mean HR, RR, and SpO₂ were 272 ± 20 bpm, 63 ± 16 breaths/min, and 92 ± 9 %, respectively. All rats maintained spontaneous ventilation, and isoflurane was not needed. No mortality was recorded. The KMB combination allowed to rapidly obtain an adequate plan of anesthesia to perform laparotomy, without the need for assisted ventilation. The used dosages, lower than those reported for the same cocktail [2], allowed a faster recovery with no complications.

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