Midazolam-Ketamine-Xylazine Infusion for Maintenance of Total Intravenous Anesthesia in Horses

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Midazolam has potential for the replacement of guaifenesin in equine anesthesia. Authors’ address: The Ohio State University, 601 Vernon L. Tharp Street, Columbus, OH 43210; e-mail: john.hubbell@cvm.osu.edu. *Corresponding author. © 2011 AAEP.

1. Introduction
This research was conducted to determine if midazolam, a water-soluble benzodiazepine, could be substituted for guaifenesin in the commonly used guaifenesin-ketamine-xylazine combination to produce intravenous anesthesia.

2. Materials and Methods
Horses were instrumented for measurement of cardiopulmonary parameters and collection of samples for arterial pH and blood gas analysis. Horses were sedated with xylazine (1.1 mg/kg, IV). Five minutes after xylazine administration, anesthesia was induced using midazolam (0.1 mg/kg, IV) followed by ketamine (2.2 mg/kg, IV). Horses were endotracheally intubated and placed in right lateral recumbency on a padded table. Ten minutes after induction, an infusion consisting of midazolam (0.002 mg/kg/min), ketamine (0.03 mg/kg/min), and xylazine (0.016 mg/kg/min) was begun to maintain anesthesia and continued for 60 minutes. Surgical stimulation consisted of exposure of the palmar digital nerves of both forelimbs for injection of test substances. Cardiopulmonary measurements were made and samples collected before and 10, 20, 30, 45, and 60 minutes after the onset of the infusion and 10 minutes after standing.

3. Results and Discussion
Cardiopulmonary measurements, with the exception of arterial partial pressure of oxygen and oxygen delivery, remained at pre-induction levels for the duration of the anesthetic period. Four of six horses required supplemental ketamine administration (100 to 250 mg, IV) during peak surgical stimulation or at the end of the infusion to facilitate transport to a recovery stall. Horses stood on the first attempt with minimal ataxia.