Butorphanol, as administered with equine dosing, does not appear to achieve similar plasma concentrations and pharmacokinetics in donkeys. Authors’ addresses: Lincoln Memorial University, College of Veterinary Medicine, Harrogate, TN 37752 (Ebner); SAGE Veterinary Centers, 7121 Amador Plaza Road, Dublin, CA 94568 (O); Department of Small Animal Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX 77843 (Simon); Department of Large Animal Clinical Sciences (Smith) and Department of Biomedical and Diagnostic Sciences (Cox), College of Veterinary Medicine, University of Tennessee, Knoxville, TN 37996; Institute of Veterinary, Animal and Biomedical Sciences, Massey University, Palmerston North, New Zealand (Lizarraga); e-mail: lisa.ebner@lmunet.edu.

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1. Introduction

This study compared the pharmacokinetic and pharmacodynamic effects of butorphanol after intravenous (IVB) and intramuscular (IMB) administration in donkeys. Healthy donkeys were administered 0.1 mg/kg butorphanol IV or IM in a randomized, crossover design.

2. Materials and Methods

Blood samples, sedation scores, and physiological parameters were obtained at predetermined intervals for up to 24 hours (IVB) or 48 hours (IMB) after administration. Plasma butorphanol concentrations were determined by high-pressure liquid chromatography, and pharmacokinetic parameters were calculated. Sedation was recorded based on a 0-to-3 whole-point sedation score.

3. Results

Following IVB administration, mean (± SD) apparent volume of distribution, elimination half-life, total body clearance, and area under the plasma concentration time curve from time 0 to infinity (AUC$_{0-\infty}$) were 270 ± 92 mL/kg, 0.82 ± 0.37 h, 378 ± 235 mL/hr/kg, and 371 ± 263 h·ng/mL, respectively. After IMB administration, a maximum plasma drug concentration of 447 ± 435 ng/mL was reached at 0.40 ± 0.22 hr. The AUC$_{0-\infty}$ was 453 ± 208 h·ng/mL. The administration of IVB and IMB resulted in no significant sedation but caused a decrease in the amount of borborygmi auscultated.
shortly after administration (15 minutes to 2 hours). Based on this study, IMB at 0.1 mg/kg is not recommended for sedation purposes in donkeys. Future directions include co-administration with an alpha-2 agonist or higher butorphanol doses.

Acknowledgments

Declaration of Ethics
The Authors have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest
The Authors have no conflicts of interest.