Pharmacokinetics and Behavioral Effects of Tramadol Following Oral Administration to the Horse

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Following oral administration of 6 and 9 mg/kg, plasma concentrations of tramadol and O-desmethyltramadol reached and were maintained within the therapeutic range for human analgesia. Authors’ address: University of California, West Health Science Drive, Davis, CA 95616; e-mail: hkknych@ucdavis.edu. *Corresponding author. © 2011 AAEP.

1. Introduction
Tramadol hydrochloride is a centrally acting μ-opioid receptor agonist used for acute and chronic pain management in humans. Currently, tramadol is not labeled for use in veterinary species; however, it has been used with some success for the management of pain, particularly in cats and dogs. Previous studies conducted in horses have failed to achieve what is believed to be therapeutic plasma concentrations for analgesia.1–3 The primary goal of this study was to describe the disposition of tramadol and O-desmethyltramadol as well as to describe any adverse physiologic or behavioral effects.

2. Materials and Methods
A randomized, balanced, 2-way crossover design was used wherein nine horses received a single oral dose of 3, 6, and 9 mg/kg of tramadol. Blood samples were collected at time 0 and at various times up to 72 hours after drug administration. Plasma samples were analyzed using liquid chromatography–mass spectrometry, and data were analyzed using noncompartmental analysis. Additionally, behavioral responses and gastrointestinal and cardiac effects were monitored.

3. Results and Discussion
Peak plasma concentrations of tramadol were 70 ± 52.6, 136.2 ± 110.0, and 253.8 ± 115.7 for 3, 6, and 9 mg/kg, respectively. Furthermore, concentrations of O-desmethyltramadol reached 29.5 ± 16.5, 42.3 ± 23.2, and 82.7 ± 47.4 for the 3, 6, and 9 mg/kg dose groups, respectively. Results of this study warrant further investigation of the anti-nociceptive effects of tramadol in the horse.

References