Evaluation of Dimethyl Sulfoxide Effects on Endotoxin-Induced Delayed Gastric Emptying in Horses

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Dimethyl sulfoxide did not show a protective effect against lipopolysaccharide (LPS) induced delayed gastric emptying. Authors' addresses: Department of Large Animal Clinical Sciences, College of Veterinary Medicine, University of Tennessee, 2407 River Drive, Knoxville, Tennessee 37996 (Kelmer, Doherty, Elliott); Department of Comparative Medicine, College of Veterinary Medicine, University of Tennessee, 2407 River Drive, Knoxville, Tennessee 37996 (Martin-Jimenez); Department of Animal Science, College of Agricultural Sciences and Natural Resources, University of Tennessee, 2407 River Drive, Knoxville, Tennessee 37996 (Saxton); and Department of Veterinary Clinical Sciences, Equine Health Studies Program, Louisiana State University, School of Veterinary Medicine, Skip Bertman Drive, Baton Rouge, Louisiana 70803 (Andrews); e-mail: galkelmer@hotmail.com (Kelmer). © 2009 AAEP.

1. Introduction
Endotoxemia is one of the most severe and ubiquitous disease processes in horses, and delayed gastric emptying is one of the most significant manifestations of endotoxemia. Oxidative damage plays a key role in the systemic effects induced by endotoxin, and thus, antioxidants, such as dimethyl sulfoxide (DMSO), might have a protective effect.

2. Materials and Methods
Eighteen horses were randomly assigned to one of four groups: Normosol® + lipopolysaccharide (LPS) (0.2 μg/kg, IV), DMSO (1 g/kg, IV) + Saline, high-dose DMSO (1 g/kg, IV) + LPS, and low-dose DMSO (20 mg/kg, IV) + LPS. Horses not receiving LPS were reassigned to a LPS group after a 2-wk washout period. All horses received acetaminophen (20 mg/kg in 1l tap water) by nasogastric intubation. Data for acetaminophen concentrations in the blood as a measure of gastric emptying were examined for the effect of treatment using a repeated-measures mixed-model analysis of variance. A value of p < 0.05 was considered significant.

3. Results
Delayed gastric emptying occurred in all horses receiving LPS. This was indicated by the lower concentrations of acetaminophen in these groups. Horses...
receiving LPS and DMSO did not have higher concentrations of acetaminophen in their blood than horses receiving LPS without DMSO. DMSO did not ameliorate the effect of LPS on gastric emptying.

4. Discussion
In this study, DMSO did not have any protective effect against LPS-induced delayed gastric emptying in horses, and it may be less effective in the management of endotoxemia in horses than was previously thought.

Footnotes

aSigma, St. Louis, MO 63103.
bAbbott Laboratories, Abbott Park, IL 60064.
cFort Dodge Animal Health, Fort Dodge, IA 50501.
dSigma, St. Louis, MO 63103.