

Evaluation of pain and meloxicam use in neonatal calf diarrhea

H. Neill,¹ DVM; E. Reppert,¹ DVM, MS, DACVIM-LA; J. Coetzee,¹ BVSc, Cert CHP, PhD, DACVCP, DACAW, DipECAWBM; A. Viscardi,¹ PhD; M. Weeder,¹ BS; D. Schwartz,¹ DVM; M. Kleinhenz,² DVM, PhD, DACVCP

¹Kansas State University, Kansas State University, Manhattan, KS 66502

²Texas A&M University, College Station, TX 77843

Introduction

Scours is one of the most common neonatal diseases affecting beef and dairy calves. Multiple etiologic agents have been implicated. The disease manifests as malabsorptive or secretory diarrhea with inflammation of the intestinal epithelium. Abdominal pain is a symptom commonly reported in humans with diarrhea. Meloxicam is approved as an adjunctive therapy in Canada and the European Union. To date, there are no studies assessing measures of pain in scouring calves, and limited information regarding the use of meloxicam as an ancillary therapy. The objective of this study was to examine behavioral and physiological outcomes associated with the expression of pain in calves with scours; and the impact administration of meloxicam has on reducing pain-related behaviors and outcomes.

Materials and methods

Twenty calves presenting for intravenous fluid therapy and treatment of scours were enrolled. Calves with significant comorbidities or prior treatment with a nonsteroidal anti-inflammatory were excluded from the study. Eight healthy controls were also enrolled. Data collected at arrival included packed cell volume and total protein, a blood gas and a fecal PCR to determine etiologic agent(s). Scouring calves were randomly assigned to receive either meloxicam at 1 mg/kg PO ($n = 10$) placed in a gelatin bolus or a placebo bolus containing cellulose powder ($n = 10$). Control calves received an oral placebo as well. Calves received the first treatment at 19:00 hours and a second dose 24 hours later. Calves were followed out to 41 hours post-dosing which coincided with 12 pm on day 2. Outcome parameters collected include pressure algometry (MNT) of the abdomen and left ischial tuberosity, kinetic gait analysis, substance P and prostaglandin E2 metabolite (PGEM) concentrations, behavioral analysis, fecal consistency score and physical exams.

Results

Data is available for approach behavior test scores, fecal scores and MNT. There were no significant differences between approach behavior ($P = 0.27$) and fecal scores ($P = 0.42$) between meloxicam and placebo treated animals, nor between healthy and clinical cases. There was a significant difference in MNT between control calves and scouring calves. The control calves had lower MNT measures at the hip site ($P = 0.007$). There were no significant differences for MNT of the abdomen observed ($P = 0.053$). Substance P, PGEM, behavior scoring and gait analysis results are still pending.

Significance

There were significant differences found between healthy and scouring calves with the ischial tuberosity measurement for MNT. This data suggests scouring calves were less reactive than control calves when stimulated. Additional data is needed before a full conclusion can be made. Further studies are needed to determine the impact oral meloxicam may have on growth and productivity.

