Assessment of pain associated with respiratory disease and the effect of flunixin transdermal solution in cattle with induced bacterial pneumonia

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Introduction

Pleuritic chest pain from bacterial pneumonia is commonly reported in human medicine; however, studies investigating pain associated with bovine respiratory disease (BRD) in cattle are lacking. The objectives of this study were to assess if bacterial pneumonia elicits a pain response in calves with experimentally induced BRD and to determine the analgesic effects of flunixin transdermal.

Materials and methods

Twenty-six calves, 6-7 months of age, with no history of BRD, were enrolled into 1 of 3 treatment groups: (BRD + FTD) – experimentally induced BRD + transdermal flunixin, (BRD + PLBO) – experimentally induced BRD + placebo, (CNTL + PLBO) – sham induction + placebo. Calves enrolled into the BRD + FTD and BRD + PLBO treatment groups were inoculated with a strain of Mannheimia haemolytica using bronchoalveolar lavage. Outcome variables were collected from -48 to 192 hours post-treatment and included clinical illness score (CIS), mechanical nociceptive threshold (MNT), computerized stethoscope lung score (CLS), and 3-axis accelerometer activity. Outcomes were statistically analyzed using repeat measures with calf being the experimental unit.

Results

There were no significant treatment effects for CIS, MNT, and CLS ($P > 0.05$). There was a significant treatment by time interaction for activity ($P = 0.01$). There were significant associations between CIS and MNT ($P < 0.01$), CIS and CLS ($P = 0.03$), and CLS and activity ($P < 0.01$).

Significance

These data show that relationships between CIS, MNT, CLS, and activity outcomes may be useful for quantifying pain from BRD, but the utility of these individual outcomes may be more limited.

