Impact of meloxicam on respiratory virus titers and health outcomes when administered concurrently with a modified live respiratory vaccine in abruptly weaned beef steers

E. Homerosky, DVM, MSc., DABVP; M. Jelinski, DVM; C. Dorin, DVM
Veterinary Agri-Health Services, Ltd., Rocky View County, Alberta, T4B 4L5, Canada

Introduction

Anti-inflammatories are highly recommended as a method to reduce pain and inflammation associated with certain diseases, injuries, stressful events and painful procedures in beef cattle. Unfortunately, glucocorticosteroids have been associated with adverse health effects when used as ancillary therapy for diseases such as bovine respiratory disease. As such, the use of less potent nonsteroidal anti-inflammatory drugs (NSAIDs), such as meloxicam, have gained popularity in recent years. Although effective at mitigating pain, meloxicam has impacts on health that are not fully understood. The first objective of this research was to determine the effects of meloxicam administered upon arrival at the feedlot on primary vaccination response. This was achieved by measuring BHV-1, BRSV, BPIV-3, and coronavirus (CV) titers i) during vaccination upon arrival at the feedlot to determine baseline titers, ii) after 7 d to detect acute immune response, and iii) after 21 d to detect peak immune response. The second objective was to determine the impact of meloxicam on health outcomes by evaluating morbidity and mortality through 45 d.

Materials and methods

Abruptly weaned crossbred steer calves (N = 271) housed in a single feedlot pen were used in a randomized, blinded 2-arm clinical trial to assess the impact of meloxicam on BHV-1, BRSV, PI-3, and CV titers and health outcomes when administered concurrently with a modified live respiratory vaccine upon arrival at a feedlot. Treatment groups included a control (saline; n = 135) and an experimental group (injectable meloxicam; n = 136). Viral antibody titers were measured on arrival, d7 and d21, and steers were examined daily for signs of disease through d45. An increase of > 20 ELISA units between time points was used to determine seroconversion. SPSS 24 was used to analyze all data and significance was established at $P < 0.05$. Differences in the direction and magnitude of change of respiratory titers within and between groups were determined using repeated measures ANOVA.

Results

All antibody titer data were non-normally distributed. All titers increased over time ($P < 0.001$), however, there were no differences by treatment group nor was there a treatment group × time interaction present for BHV-1, BRSV, PI-3, or CV. Within the IBR titer data, a greater proportion of steers in the meloxicam group seroconverted by d21 compared to the control group ($P = 0.01$), however, this was driven by the greater proportion of steers categorized as having negative titers to BHV-1 in the meloxicam group compared to the control group at arrival ($P = 0.03$). There were no differences regarding the proportion of steers classified as having negative titers at arrival or the proportion that seroconverted by d7 or d21 for BRSV, BPIV-3, or CV. Associations between morbidity and treatment group trended toward significance, as all 4 treated steers received meloxicam on arrival (control = 0.0%, meloxicam = 2.94%; $P = 0.12$). Only one of these steers died (control = 0.0%, meloxicam = 0.74%) precluding mortality statistical analysis.

Significance

In conclusion, the administration of meloxicam on arrival at the feedlot may adversely affect health, however, a decreased vaccine response is likely not a contributing factor. Further research is warranted to explore the complex relationship between NSAID administration and the potential for increased treatment risk.

