

Behavioral evaluation of the analgesic effects of flunixin meglumine in lame dairy cows

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Introduction

Lameness is a commonly occurring condition in dairy cows in the United States and worldwide. There is substantial evidence that lameness alters the behavior of affected dairy cows in ways that indicate the presence of pain, including increased time spent lying down each day, alterations in locomotion, and increased shifting of weight between the rear limbs. There is also evidence that treatment of lame dairy cows with non-steroidal anti-inflammatory drugs (NSAIDs) can reduce behavioral signs of pain. The objective of this study was to evaluate the effects of the NSAID flunixin meglumine on lameness-related behavior in dairy cows.

Materials and Methods

Twenty-four lactating grade Holstein dairy cows housed in a free stall barn at a privately owned dairy farm were enrolled in the study. Cows were selected for enrollment based on observation of abnormal locomotion consistent with lameness. Cows were randomly assigned to 2 treatment groups; 1 group was treated intravenously once with 1 mg/lb (2.2 mg/kg) body weight flunixin meglumine (2 mL/100 lb), and the other group was treated intravenously once with an equivalent volume of isotonic sterile saline solution. Two days prior to treatment, each cow was recorded on video once a day while walking and stood on a scale that recorded the weight borne on each limb more than 10 times per second. Videos were scored by a masked, trained observer using a 5-point scale in which a score of 1 indicates no signs of lameness and 5 indicates non-weight-bearing lameness. Following

drug treatment each cow had weight-shifting data collected 2, 6, 12, and 24 hours following treatment. Weight-shifting behavior was measured as the standard deviation of the weight borne on each leg over 2 to 3 sessions, each lasting 5 minutes, at each data collection point. Weight shifting behavior was compared statistically between drug-treated and control cows. The standard deviation of mean weight borne on the rear limbs was analyzed using a general linear mixed model with repeated measures. The model used included fixed effects of treatment, time and treatment by time interaction.

Results

Mean baseline locomotion scores (averaged over 2 days) for the two treatment groups were 2.38 in the flunixin-treated group and 2.43 in saline-treated control group. Standard deviation of the mean weight borne on the rear legs for the 2 treatment groups was not different on either pre-treatment day, indicating that baseline weight shifting behavior was not different ($P>0.05$). Cows treated with flunixin meglumine had less weight-shifting between the rear limbs at 6 hours, 12 hours, and 24 hours following treatment, when compared to saline-treated controls ($P<0.05$).

Significance

Lame dairy cows treated with flunixin meglumine had decreased rear limb weight-shifting behavior after treatment when compared to saline-treated control cows, indicating that flunixin meglumine alleviates lameness-associated pain in dairy cows.