

# Examination of the Use of Intrauterine or Systemic Antimicrobial Therapy to Prevent Puerperal Metritis in Dairy Cows with Dystocia

**J.M. Pinos-Rodriguez, DVM, PhD; N.J. O'Boyle, BVSc, MRCVS; P.M. Sears, DVM, PhD**  
*College of Veterinary Medicine, Michigan State University, East Lansing, MI 48824*

## Introduction

Cows with dystocia are considered as abnormal calving if delivered by hand or with a calf puller, and as having risk factors for puerperal metritis (PM) if a discharge occurs following calving. In recent years, untreated cows with postpartum metritis have increased the debate over the need of intrauterine or systemic antibiotic in the treatment of PM. This is further complicated by the studies that lack good control groups of untreated cows. Therefore, the objective of this study was to evaluate the influence of non-treatment, intrauterine antibiotic, and systemic antibiotics on PM incidence of dairy cows with abnormal calving.

## Materials and Methods

Our study was conducted from December 2008 to March 2009 on a large commercial dairy farm in Michigan. The herd consisted of 3,000 lactating cows milked three times daily. Heifers (n = 24) and cows (n = 45) with abnormal calving were enrolled in the study. Immediately after calving, animals that qualified for the trial were blocked and randomly assigned to the treatments as follow: 1) control (no treatment); 2) intra-uterine tetracycline bolus, 3g (TB) at 1, 3, and 5 days-in-milk (DIM); 3) single subcutaneous injection of ceftiofur hydrochloride, 4 g (CH) crystalline free acid, administered at the base of the ear. Metritis and retained fetal membranes (RFM) were evaluated at 24 h after calving. Rectal examination and temperature were recorded at 2, 4, 8, and 16 DIM. Uterine fluid was scored 0, translucent mucus; 1, < 50% off-white mucopurulent material; 2, > 50% off-white mucopurulent material; 3, red-brown watery foul-smelling uterine discharge (clinical PM). The ability to retract the uterus (cervix and horns) at examination was scored and recorded as 0, no uterus retraction; 1, uterus retraction. Body condition score (BCS) at calving day and 16 DIM was also recorded. Cows receiving anti-inflammatory drugs or systemic drugs for purposes not related to the study (i.e.,

acute mastitis, displaced abomasum, etc.) were excluded from the trial. The experiment was a randomized block design where due date, parity (cows and heifers), and breed (Holstein and crossbreds). Body condition score and rectal temperature were analyzed with MIXED procedure. Block was included as a random component in the model. Uterine fluid and uterus retraction data were analyzed with FREQ and GENMOD procedures.

## Results

The highest rectal temperature (102.1°F) was found at 4 DIM as compared to 2 (101.9°F), 8 (101.8°F) and 16 (101.5°F) DIM. Cows untreated had similar (P > 0.05) rectal temperatures compared to cows receiving TB or CH. From calving date to 16 DIM, cows lost 0.82 points of BCS, but this variable was not affected by treatments. The RFM incidence was 17.47% (n = 12), of which 41.6% corresponded to control, 50% to TB, and 8.33% to CH (Chi-square probability = 0.12). At 2, 4, 8, and 16 DIM the percentage of cows with scoring a uterine fluid 3 were 1.81 (n = 5), 2.54 (n = 7), 4.71 (n = 13), and 1.09 (n = 3). Thus, PM incidences were 10.15% (5.8% control, 3.26% TB 1.09% CH) of which 57.14% corresponded to control, 32.15% for TB, and 10.71% for CH (Chi-square probability = 0.01). There was a strong association between RFM and PM (r = 0.74, P < 0.001). At 16 DIM, uterine retraction was possible for 71% of the cows, 29.5% was for control, 25% for TB, and 45.4% for CH (Chi-square probability = 0.0003).

## Significance

These preliminary results suggested that dairy cows treated with systemic CH after dystocia had decreased incidence of PM and improved uterine involution as compared to cows with intrauterine TB or untreated cows. Because PM was determined using uterine fluids which had a strong association with RFM, statistical analysis excluding cows with RFM from the uterine fluid analysis are being considered.