

Impact of Sealant Adherence on the Efficacy of a Dry Cow Teat Sealant in Reducing the Level of Intramammary Infection in Non-lactating Dairy Cows

G. Lim, BSc, MSc; K. Leslie, DVM, MSc; D. Kelton, DVM, MSc, PhD; J. TenHag, BSc, MSc; T. Kerbler, BSc, MSc; K. Day, DVM

University of Guelph, Guelph, Ontario, Canada

Introduction

The conventional approach to eliminate and prevent new intramammary infections over the dry period is to infuse all quarters with a long-acting dry cow antibiotic. However, this approach is not without controversy, and alternative methods aimed at teat-end protection have been developed. The use of an external teat sealant to form a physical barrier is one such example. The objective of this study was to determine if application of a dry cow teat sealant at drying-off significantly reduced the level of infection at calving, and the impact of sealant adherence on achieving this outcome.

Materials and Methods

Between May 1997 and January 1999, all cows entering the dry period in two research herds were enrolled. At drying-off, teats from each cow were randomly assigned to one of three treatment groups: single sealant application (SINGLE); double sealant application (DOUBLE); and two teats were infused with a dry cow antibiotic (DCT). In addition to duration of sealant adherence, teat characteristics and cow-level factors were recorded. Quarter milk samples were collected for somatic cell count and bacteriological analysis at four intervals: 1) 7 days prior to drying-off, 2) at drying-off, 3) 0 to 7 days post-calving, and 4) 14 to 21 days post-calving. Analysed outcomes using multivariable techniques were the days of sealant adherence, linear score at 14 to 21 days post-calving, and new quarter infections caused by environmental streptococci and coliforms. The MIXED and GENMOD procedures in SAS v.8.0 (Cary, NC) were used to analyse the data, and generalized estimating equations were applied to adjust for correlation among quarters within the same cow. Statistical significance was declared at $p < 0.03$ for days of adherence, while $p < 0.10$ was used in the analysis of linear score and bacteriological outcomes, due to the frequency of missing observations. Herd and parity effects were forced into all models.

Results

Data from 162 cows over 172 non-lactating periods (688 quarters) were available for consideration in this trial. Of all the teats that were dipped in sealant twice at drying-off, 43.0% were protected for more than three days, while only 25.8% of teats in the once-dipped group were protected for more than three days. In the final multivariable model for days of sealant adherence, factors identified as being statistically significant were frequency of sealant application ($p < 0.01$), season of drying-off ($p < 0.01$) and teat length ($p = 0.01$). After adjusting for other effects in the final multivariable model, double sealant application was associated with a 0.7-day increase in adherence, versus single sealant application (2.8 vs. 2.1 days, respectively). Similarly, teats that were dipped during the winter and spring seasons (December to May) and teats that were greater than two inches in length prolonged sealant adherence to the teat-end by up to one day at drying-off (2.9 vs. 2.0 days, and 2.8 vs. 2.1 days, respectively).

To assess the impact of duration of sealant adherence on the level of infection at calving, teats were classified according to the following five possible classifications: 1) DCT, 2) SINGLE with 0 to 3 days of adherence, 3) SINGLE with 4 or more days of adherence, 4) DOUBLE with 0 to 3 days of adherence, and 5) DOUBLE with 4 or more days of adherence. In the final multivariable model for linear scores at 14 to 21 days post-calving, this multi-level variable ($p = 0.09$), the season of calving ($p < 0.01$), and linear score at drying-off ($p < 0.01$) were identified as significant effects. After adjusting for other variables in the model, the mean linear score was 0.6, 0.8, and 0.4 days lower for teats in the SINGLE: 4+, DOUBLE: 0 to 3, and DCT group, respectively ($p = 0.09, 0.01, 0.04$), relative to teats in the SINGLE: 0 to 3 group (mean = 2.7 days). A high linear score at drying-off (≥ 4) and calving during the spring or summer seasons (March to August) also increased the

linear score post-calving. No effect of treatment and adherence could be determined using bacteriological outcomes, due to the low number of new intramammary infections observed over the dry periods in this study.

Conclusions

The results from this investigation suggest that the use of dry cow teat sealant has a benefi-

cial impact on the level of infection at calving if a durable seal is formed and remains on the teat-end for a prolonged period of time at drying-off. However, since dry-cow teat sealants do not eliminate any existing infections, appropriate strategies aimed at identifying infected quarters must be applied so that appropriate measures are taken to ensure they do not remain infected over the dry period.

Prognosis for Survival after an Open Abomasal Surgery Following an Unsuccessful Toggle-Pin Fixation in Dairy Cows

G. A. Perkins, DVM, DACVIM; D.V. Nydam, DVM, PhD; S. A. Kimball; S. L. Fubini, DVM, DACVS

Departments of Clinical Science and Population Medicine, College of Veterinary Medicine, Cornell University, Ithaca, NY

Displaced abomasums are among the most common production-limiting conditions needing veterinary medical and surgical attention. Randomized clinical trials have shown an equally good prognosis for open surgical correction and toggle-pin fixation. Both procedures have advantages and disadvantages, complications and failures. There has been a perception that cows that have had toggle-pin fixation with bad outcomes may not be salvageable. The purpose of this study was to investigate the outcome of surgical correction following a failed roll-and-toggle procedure, and to identify prognostic indicators.

A retrospective study of cows admitted to the Cornell University Hospital for Animals with a history of a toggle-pin fixation performed from January 2000 to December 2002 was performed (n=53). Only cows that had been toggled during the present lactation were included. Data collected included the signalment, history, physical examination, packed cell volume, total protein, ultrasonographic examination, abdominocentesis, findings during laparotomy and necropsy examination, treatments and duration of hospitalization. Herd managers were contacted for cows that were discharged alive for follow-up data concerning long-term survival. Chi-square and t-tests were used to compare survivors versus non-survivors. A $p < 0.05$ was considered statistically significant.

Fifty-two Holstein and one Jersey cow with a mean age of three years (range) were included in

the study. Most of the cows (88%) were less than 60 days in milk, and 75% were admitted to the hospital less than 7 days since the toggle procedure had been done. Only 10 cows had external abnormalities at the toggle site. An abdominocentesis was performed in the right paramedian region in four cows, revealing a modified transudate. Ultrasonographic examination of the right paramedian region was done in 13 cows, 10 of which revealed abnormalities including peritoneal fluid and fibrin, subcutaneous edema and a thrombus in the milk vein. Forty-five cows had a right paramedian abomasopexy (RPA) and two had a right flank pyloropexy performed. Following the RPA, 11 cows were euthanized because of findings at surgery and two died. One of the cows that had a right flank pyloropexy was euthanized. Six cows were euthanized or died without having surgery. The mean length of hospital stay was two days (range 0.5-9 days). There was a trend towards a higher proportion of cows that were discharged alive from the hospital 62% (33/53) than those that died or were euthanized 38% (20/53) ($p = 0.07$). However, when looking at the proportion of cows that survived or were in the herd 60 days post-discharge, 59% (27/46) were no longer in the herd and 41% (19/46) were present. These proportions were not significantly different.

The pulse and packed cell volume were significantly higher in cows that did not survive to