

A Retrospective Study of Risk Factors that Affect Outcomes in Bovine Cesarean Sections (1998-2003)

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Introduction

Bovine cesarean sections are one of the most commonly performed procedures in bovine practice with a variety of outcomes. A number of risk factors that affect outcomes have been proposed, but substantiated by clinical impression alone. The purpose of this retrospective study was to determine whether there was a difference between elective, emergency non-emphysematous and emergency emphysematous presentations. The objective was to compare whether the ability to exteriorize the uterus during fetal delivery and/or calf viability at the time of fetal delivery have effects on outcome.

Materials and Methods

A computerized search of medical records to conduct a retrospective study on bovine cesarean sections yielded 179 surgeries conducted by 14 veterinarians in a five year period (1998-2003). Records were analyzed for signalment, presenting complaint, surgery data and outcome. Descriptive and odds ratio statistics were calculated.

Results

Dairy cattle accounted for 42.5% compared to 57.5% for beef cattle. Heifers and mature cows were evenly split, 50.3% and 49.7%, respectively, and were evenly split within breeds (dairy heifers 50%, dairy cows 50%, beef heifers 50.5% and beef cows 49.5%). Only 10.1% of the cesareans performed were classified as elective, the majority (89.9%) of cesareans are done on an emergency basis. The standing left paralumbar approach was the most commonly used (81.6%), followed by ventral midline (13.4%), the right low oblique (2.8%) and the right paralumbar approach was used least often (2.2%). Fewer live calves were delivered by cesarean (44.2%) than dead calves (55.8%), emphysematous calves accounted for 13.4% of the dead calves. The uterus was exteriorized in 81.5% of the cases regardless of the approach. Complications were encountered in 51.1% of the cases: failure to exteriorize the uterus (21.9%), either a torn or friable uterus the time of surgery (10.2%), the dam falling down during surgery (9.5%), performing a cesarean on a downer (6.6%), or other (2.9%). The

majority of cesareans were treated on an outpatient basis, with 60.9% discharged within 24 hours of admission. The overall mortality rate of 10.6% was based on discharge status. The data were stratified on the basis whether the procedure was elective, emergency (non-emphysematous), and emphysematous.

Except for one cow that developed metritis post-operatively, all cows and calves under elective cesarean survived. Emergency cases yielded a 88.4% survival rate for the dam, and a 43.9% survival rate for the fetus. Intra-operative complications (poor condition of the uterus at the time of surgery, and dams either falling down or already down at the time of surgery) were associated with the development of peritonitis post-operatively. Emphysematous cases yielded an 85% survival of the dam: when done under a general anesthetic survival was 100% (11/11), whereas those done with local anesthetic had a survival rate of 76.9% (10/13). Though the use of a general anesthetic likely facilitated exteriorization and/or isolation of the uterus, these dams more often received intensive fluid therapy, oxytetracycline and flunixin meglumine pre- and post-operatively. The overall odds of a dam surviving whose uterus was exteriorized during fetal delivery was estimated to be 8.6 times the odds of a dam surviving whose uterus was not exteriorized (approximate 95% confidence interval: 3.1 to 23.7). The odds of a dam surviving which presented on emergency with a live calf was estimated to be 3.2 times the odds of a cow surviving that presented on emergency with a dead calf (approximate 95% confidence interval: 1 to 16.4). The odds of a dam surviving presenting on emergency whose uterus was exteriorized during fetal delivery was estimated to be 6.6 times the odds of a dam surviving whose uterus was not exteriorized (approximate 95% confidence interval: 2.2 to 21.1). The odds of a dam surviving that presented on emergency whose uterus was exteriorized during delivery of a live calf was estimated to be 10.2 times the odds of a dam surviving whose uterus was not exteriorized (approximate 95% confidence interval 1.2 to 125.1). The odds of a dam surviving that presented on emergency whose uterus was exteriorized during delivery of a dead calf was estimated to be 5.8 times the odds of a dam surviving whose uterus was not exteriorized (approximate 95% confidence interval 1.6 to 21.6).

Significance

This study supports the importance of exteriorizing the uterus during fetal delivery, especially for a dead calf. Intra-operative complications were associated with the development of peritonitis post-operatively. Supportive therapy likely plays a significant role in dam survivability when dealing with emphysematous calves. The positive results of elective cesareans with respect to both dam and calf survival supports the concept that bovine cesarean sections should not be considered an option of last resort.

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Antimicrobial Treatment of Fresh Cows with Subclinical Gram Positive Mastitis

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Introduction

Subclinical mastitis is a major contributor to the bulk tank somatic cell count (SCC). Dairies with a moderate to high bulk tank SCC and a low clinical mastitis rate can expect to have a number of cows with subclinical mastitis. Using Dairy Herd Improvement (DHI) SCC results on a regular basis, subclinical mastitis can be identified as the high SCC cows. Identifying the high SCC cows is relatively easy on herds that utilize DHI testing on a regular basis. However, not all high SCC cows need treatment nor is it cost effective to treat all high SCC cows. Antimicrobial treatment should be reserved for those cows that treatment is likely to cure. It is generally regarded that these cows are relatively early in lactation with gram-positive, environmental mastitis (*Staphylococcus* spp and *Streptococcus* spp) and have not had chronic episodes of clinical mastitis. This study compared the cure rates of fresh cows with subclinical gram-positive mastitis with and without intramammary antimicrobial treatment.

Materials and Methods

On a 3,000 Holstein cow commercial dairy, one four-quarter composite milk sample was taken from every fresh cow within 1-7 days in milk. The milk sample was then cultured using standard culture techniques. All cows that were culture positive for *Streptococcus* spp, *Staphylococcus* spp, or *Staphylococcus aureus* were enrolled in the trial. Cows with clinical mastitis were excluded from the trial. All cows enrolled in the first two months were the non-treated controls. All cows enrolled in the following two months were treated with cephapirin sodium (Cefa-Lakâ), one tube in each of the

four quarters intramammary (IMM) once a day for three days. A cure was defined as a linear score less than 4.0 at the first test following antimicrobial treatment. Post-treatment milk samples were not collected for culture.

Results

Cows with a linear score greater than 4.0 at first test in the non-treated control group were 5/12 (41.7%) for *Streptococcus* spp, 34/71 (47.9%) for *Staphylococcus* spp, and 8/12 (66.7%) for *Staphylococcus aureus*. Cows with a linear score greater than 4.0 at first test in the treated group were 8/13 (61.5%) for *Streptococcus* spp, 6/16 (37.5%) for *Staphylococcus* spp and 4/6 (66.7%) for *Staphylococcus aureus*. There was no significant difference in any of the groups ($p=.55$, $p=.63$, $p=.69$, respectively).

Significance

Treating fresh cows with subclinical gram-positive mastitis with IMM cephapirin sodium did not significantly reduce linear score for those cows compared to non-treated controls in all cases. Previous work has illustrated that a cow loses about 3 lb (1.36 Kg) of milk for every one increase in linear score. Although reducing a cow's SCC at the beginning of lactation does not guarantee a low SCC for the remainder of lactation, it does increase the chance that she will produce more milk at the beginning of lactation, and thus potentially reach higher peak milk than if she continued to have a persistently high SCC. IMM treatment of fresh cows with subclinical *Staphylococcus* spp mastitis is not an effective way to reduce early lactation SCC only in cows with subclinical *Staphylococcus* spp mastitis.