

Effect of Repeated Embryo Collection Attempts on Uterine Health in Mares

Karly A. Macon, Patrick M. McCue, Elaine M. Carnevale, Edward L. Squires
Animal Reproduction and Biotechnology Laboratory
Colorado State University
Ft. Collins, CO 80523

Several equine breed organizations have recently approved the registration of multiple foals from a single mare in a breeding season. Thus, numerous embryo collection attempts on mares are made each year. The objective of this study was to evaluate the effect of repeated embryo collection on uterine health parameters in mares.

Thirty-two mares were utilized during the 2002 breeding season. Group 1 mares (n=20) were inseminated prior to ovulation and embryo collection procedures were performed 6 to 8 days after ovulation for three consecutive cycles. Group 2 mares (n=12) were not bred or flushed and served as untreated control mares. During the pre-treatment cycle, uterine culture, cytology and biopsy samples were collected and the presence or absence of uterine fluid was evaluated by transrectal ultrasonography. Mares in Group 1 were subsequently inseminated every other day during estrus once a follicle ≥ 35 mm was first detected. A uterine lavage was performed 6 to 8 days after ovulation. Cloprostenol (250 μ g) was administered immediately after the embryo collection attempt, and culture, cytology and ultrasound data were collected 4 days later. The breeding, flushing and data collection procedures were repeated for 3 consecutive estrous cycles. A second uterine biopsy sample was collected four days after the third embryo collection attempt. Mares in Group 2 were evaluated once at the onset of the study and once at the end of the study at approximately the same dates as mares in Group 1. Data for culture, cytology, biopsy and ultrasound were assigned numerical scores. The average of the numerical scores made up the overall reproductive score.

Data for treated mares were analyzed by repeated measures ANOVA for changes over cycles 0, 1, 2, and 3 and 0 versus 3, whereas a comparison of data for treated and control mares was made at cycles 0 and 3. For treated mares, the grade of cytology and ultrasound did not change over time, whereas culture grade tended ($p < 0.09$) to increase from cycle 0 to 3. Overall reproductive score increased from pre-treatment to cycle 3. When comparisons for treated mares were made between pre-treatment and cycle 3, culture, cytology and overall reproductive score increased over time. When data for treated and control mares were compared, there were no treatment, cycle, or interaction effects for ultrasound or cultures; however, cytology grades increased from pre-treatment to cycle 3. Biopsy score tended to be higher ($P = 0.08$) for treated than controls. Reproductive scores also tended ($p = 0.07$) to be higher for treated than controls, with a higher ($p < 0.05$) mean at cycle 3 than pre-treatment. These results suggest that repeated embryo collection attempts may have a slight deleterious effect on endometrial health. Long-term consequences of repeated embryo collection attempts remain unknown.

Key Words: Equine, Embryo Transfer, Uterus, Biopsy