In vivo embryo production during induced aluteal cycles in the mare
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A proof of concept experiment was designed to investigate the feasibility of generating equine embryos during aluteal cycles induced by antiluteogenic treatments administered shortly after ovulation. Four cyclic mares with a median age of 9.5 years (range 9 to 16) were utilized. Mares were monitored until a preovulatory follicle \( \geq 35 \) mm was detected on the ovary in the presence of uterine edema as determined by ultrasonography. A fertile stallion was used for artificial insemination with each breeding dose comprised of \( \geq 1 \times 10^9 \) total motile sperm. Mares were artificially inseminated and human chorionic gonadotropin (hCG; 2000 IU, IV; Chorulon, Merck Animal Health, Kenilworth, NJ) administered. Blood was collected every other day until ovulation was detected by twice daily ultrasonography. Once ovulation was detected, dinoprost (10 mg, IM; Lutalyse, Zoetis, Florham Park, NJ) was administered once daily for 5 days. Daily blood samples were collected from ovulation until the day of embryo collection 8 days after ovulation. Following embryo collection, mares were monitored until they returned to estrus, and then artificially inseminated as described above. After ovulation was detected, mares were again subjected to the 5 day antiluteogenic treatment. Then on day 6 after ovulation long acting biorelease altrenogest (225 mg, IM; BET Pharm, Lexington, KY) was administered to evaluate the ability to establish pregnancy after progesterone deprivation during early embryogenesis. Data are reported as mean ± S.E.M. The mean interovulatory interval between subsequent antiluteogenic cycles was 13.5 ± 0.87 d. The mean daily progesterone concentration from ovulation to embryo collection was 0.40 ± 0.15 ng/mL. After the first ovulation, two of four mares produced embryos. Two mares became pregnant with heartbeats detected 22 days after the second ovulation. The mean daily progesterone concentration from ovulation to 22 days after ovulation was 0.64 ± 0.36 ng/mL. Only one mare failed to produce an embryo and become pregnant during both cycles. This study demonstrated that embryos could be collected from mares when antiluteogenic treatment was initiated immediately after ovulation resulting in an aluteal cycle. Furthermore, viable pregnancies were established after progesterone deprivation during early embryogenesis.

Keywords: Antiluteogenesis, embryo collection, aluteal, pregnancy, progesterone