Induction of Ovulation in the Mare With Recombinant Equine Luteinizing Hormone

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Administration of recombinant equine luteinizing hormone (reLH) is a safe and effective means of inducing ovulation in the mare. Antibodies are not produced against the molecule when injected into the mare, and a 750-μg dose of reLH was as effective as hCG at inducing ovulations in this study. Authors’ addresses: Reata Equine Hospital, 6516 Granbury Hwy, Weatherford, TX 76087 (Niswender); Department of Animal Science, University of California, Davis, CA 95616 (Roser); Department of Pharmacology and Obstetrics/Gynecology, Washington University School of Medicine, St. Louis, MO 63110 (Boime); and Aspen Bio Pharma, Castle Rock, CO 80104 (Colgin); e-mail: koryniswender@yahoo.com (Niswender). © 2006 AAEP.

A novel single-chain recombinant equine luteinizing hormone (reLH) product has recently been developed that has both in vitro and in vivo bioactivity. The use of reLH to induce ovulation in the mare is intriguing, because mares should not become refractory to its use over time if it is not recognized as a foreign protein. As part of an initial safety study, four mares were administered 5 mg reLH one time daily for 6 days. They were then given another 1 mg reLH 20 days after the first injection. Blood was collected from these mares 7 days after the last injection of reLH, and the serum was analyzed for the presence of reLH antibodies by radioimmunoassay (RIA). There were no detectable reLH antibodies. The objective of the present study was to determine an effective dose of reLH for the induction of ovulation in mares. Eighty-five light-horse broodmares, ages 3–13 yr, underwent daily ultrasound exams until a ≥35 mm and <39 mm follicle was detected and uterine edema was noted. They were then allocated to six different treatment groups and administered sterile saline (n = 20, negative control), 2500 IU hCG (n = 7, positive control), 300 μg reLH (n = 7), 600 μg reLH (n = 20), 750 μg reLH (n = 10), and 900 μg reLH (n = 20). Lyophilized reLH and hCG were reconstituted with sterile saline immediately before use, and all treatments were administered intravenously. Mares were examined using ultrasound every 12 h after treatment for 72 h and then every 24 h until ovulation was detected. Mares were examined 7 days post-ovulation for the presence of a corpus luteum, and blood was collected for assay of serum concentrations of progesterone by a validated RIA. Time to ovulation among treatment groups was compared using one way analysis of variance (ANOVA). No difference was noted in time to ovulation between negative control mares and mares that received 300 μg reLH (p = 0.60) or 600 μg reLH (p = 0.30). Three of twenty control mares ovulated within 48 h of treatment, and 2 of 7 mares in the 300-μg reLH group ovulated within 48 h. Ten of twenty mares in the
600-μg reLH group ovulated within 48 h. Six of seven mares in the hCG group ovulated within 48 h. Nine of ten mares in the 750 μg reLH group and sixteen of twenty mares in the 900 μg reLH groups ovulated within 48 h, making both groups similar to the hCG group (p = 0.90 and p = 0.67, respectively). All mares clearly had a corpus luteum (CL) present on the ultrasound exam 7 days post-ovulation, and all concentrations of progesterone in serum were >8 ng/ml. In this study, 750 μg of reLH seems to be an optimum dose for inducing ovulation within 48 h of treatment. ReLH may be an important tool in manipulating reproductive function in the horse.

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