

USE OF PROGESTERONE IN POLY (D-,L-LACTIDE) MICROSPHERES FOR SUPPRESSION OF ESTRUS IN MARES

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Temperament and performance of mares can vary with the ovarian cycle [McDonnell SM. In Robinson EN, editor. Current therapy in equine medicine. Elsevier Science; 2003. p. 264–9].

Mares may become unmanageable to varying degrees, which is undesirable in performance horses, particularly in the height of competitive season. Intramuscularly-administered progesterone suspended in sesame oil can be effective for suppressing estrous behavior in mares but it must be given daily (0.66–1.3 mg/lb) to maintain effective concentrations of progesterone for blocking estrus [Neely DP. In Proceedings of the 34th annual meeting American association of equine practitioners; 1998. p. 202–18]. However, the frequency of administration of intramuscular injections is often not acceptable to owners. The development of a long-acting injectable progesterone for the suppression of estrus in mares would be beneficial to the equine industry.

Out objective was to compare suppression of estrous behavior in mares following intramuscular administration of two dosages of a compounded formulation of progesterone in microspheres. The hypothesis was that estrus suppression following administration of 2 mg/lb of progesterone would be of longer duration than following administration of 1 mg/lb of progesterone.

Mares were monitored daily by teasing to a stallion, rectal palpation and transrectal ultrasonography. Seven days following ovulation, 10 mg PGF2alpha (Lutalyse[®], Upjohn Pharmacia) was administered intramuscularly to all mares. Two days following PGF2alpha administration, mares received either 1 mg/lb ($n = 3$) or 2 mg/lb ($n = 5$) of progesterone in poly (D-,L-lactide) microspheres (BET Pharmacy) intramuscularly. In addition to daily monitoring of behavioral response to a stallion, jugular venous samples were collected daily and serum progesterone concentrations were determined by radioimmunoassay. A numerical scale for quantifying estrous behavior was used [Oklahoma Cooperative Extension Service. Teasing and Insemination Methods for Breeding Mares. <http://www.Mofox Trot.com/teasing-insemination.htm>] Progesterone concentration and estrous behavior was compared between groups using ANOVA. Significance defined as $P < 0.05$.

Injection of progesterone microspheres elevated mean progesterone concentrations >1.5 ng/ml for 10 days irrespective of dose. A 2 mg/lb dose produced significantly higher circulating progesterone concentrations compared to the 1 mg/lb dose for the first 8 days following treatment. Subtle estrus suppression was observed for 2–6 days and 1–4 days following the 1 mg/lb and 2 mg/lb progesterone treatments, respectively, but did not differ significantly between groups. In addition, 88% of mares developed local injection site reactions and 60% of mares receiving the 2 mg/lb dose developed a febrile response following treatment. Administration of 1 mg/lb progesterone in microspheres was equally effective as a 2 mg/lb dose with respect to estrus suppression and produced fewer side effects.

Keywords: Estrus suppression; Progesterone; Mare