Competitive Session

Anti-luteogenic and luteolytic effects of $PGF_{2\alpha}$ during the post-ovulatory period in mares

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In the present study, it was hypothesized that mares receiving multiple doses of $PGF_{2\alpha}$ during the post-ovulatory period would undergo luteolysis similar to control mares given a single injection of $PGF_{2\alpha}$ during mid-diestrus. The specific objectives were to document the effects of $PGF_{2\alpha}$ treatment on concentrations of plasma progesterone (P_4) and interval to ovulation. Cycling mares were examined using transrectal ultrasonography once daily (when in estrus) and were allocated to treatment groups as follows: Group I ($n = 10$) received 2.5 mg of $PGF_{2\alpha}$ IM (Lutalyse®, Pfizer Animal Health, New York, NY, USA), on Day 10 (ovulation = Day 0); Group II ($n = 10$) received 2.5 mg of $PGF_{2\alpha}$ once daily on Days 2, 3, and 4; Group III ($n = 7$) received 2.5 mg of $PGF_{2\alpha}$ twice daily on Days 0, 1, and 2; and Group IV ($n = 6$) received 10 mg of $PGF_{2\alpha}$ twice daily on Days 0, 1, and 2. Plasma samples were collected daily and stored at -20 °C pending determination of P_4 (RIA). An ANOVA was used to compare plasma P_4 concentrations and intervals from $PGF_{2\alpha}$ treatment to ovulation. Data are presented as mean (±S.E.M.) and intervals from treatment to ovulation were relative to the first $PGF_{2\alpha}$ treatment. For Groups I, II, III, and IV, plasma P_4 concentrations (ng/mL) before treatment were 12.05 ± 1.6, 5.3 ± 0.7, 0.2 ± 0.04, and 0.5 ± 0.3, respectively ($P < 0.05$), 3 d after the start of treatment they were 0.6 ± 0.1, 1.3 ± 0.14, 1.3 ± 0.5, and 0.48 ± 0.2 ($P > 0.05$), and 5 d after the start of treatment they were 0.5 ± 0.07, 1.8 ± 0.4, 2.9 ± 1.0, and 0.5 ± 0.4 ($P < 0.05$). All mares in Group I ovulated 8.2 ± 0.7 d after treatment. In Group II, six of 10 mares underwent complete luteolysis and ovulated 9.4 ± 1.4 d after treatment; the remaining four mares underwent partial luteolysis, followed by a resurgence in luteal function ($P_4 > 1.0$ ng/mL), and ovulated 14.7 ± 2.1 d following treatment. For all mares in Group III, $PGF_{2\alpha}$ treatment markedly suppressed the rise in plasma P_4, followed by resurgence in luteal function. Six Group III mares ovulated 14–26 d after treatment and one remained anovulatory. In Group IV, $PGF_{2\alpha}$ treatment also had an anti-luteogenic effect; mean plasma P_4 on Day 5 remained < 1.0 ng/mL, and four of six mares ovulated 7.0 ± 1.8 d after treatment.

In summary, luteal function was affected by $PGF_{2\alpha}$ treatment in mares during early diestrus (Group II); the immature CL was responsive to multiple $PGF_{2\alpha}$ injections. Serial administration of $PGF_{2\alpha}$, beginning on the day of ovulation, had an anti-luteogenic effect, manifested as low plasma P_4 concentrations for several days after treatment, especially in mares of Group IV (that received a higher dose of $PGF_{2\alpha}$ than those in Group III). Future adjustments in $PGF_{2\alpha}$ treatment (frequency and dosage) may increase the percentage of mares ovulating in Groups II and IV.

Keywords: Corpus luteum; $PGF_{2\alpha}$; Anti-luteogenic; Luteolysis; Horse

DOI: 10.1016/j.theriogenology.2008.05.005

Comparison of three doses of reFSH for super-ovulation of mares

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Superovulation using purified equine follicle stimulating hormone (eFSH) increased the efficiency of embryo recovery in mares. In preliminary studies, recombinant equine FSH (reFSH) stimulated ovarian follicular development in transitional mares and increased ovulation rates of cycling mares. The objective of this study was to compare ovulation and embryo recovery rates among three doses of reFSH. Our hypothesis was that reFSH would have a dose-dependent increase in ovulation and embryo recovery rates.

Twenty-eight mares were randomly assigned to one of five treatment groups (total of 67 estrous cycles). Mares in Group 1 served as untreated controls. Mares in Group 2 received 12.5 mg eFSH twice daily IM, whereas those in Groups 3, 4, and 5 received 0.35, 0.5, or 0.65 mg reFSH, twice daily IM, respectively. Mares were allowed to go through one estrous cycle (to determine day of ovulation) and treatment was initiated when a follicle 22–25 mm in diameter was detected. Mares received cloprostenol sodium (250 μg IM) on the second day of treatment; eFSH or reFSH was given until ≥50% of the developing follicles reached 35 mm in diameter. Mares were allowed to 'coast' for 36 h before