Effect of human chorionic gonadotropin (hCG) treatment on the duration of oxytocin-induced prolonged corpus luteum (CL) function in mares

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Two protocols are now available for using oxytocin treatment to induce prolonged CL function to suppress estrous behavior in performance mares. One protocol involves determining the day of ovulation, and administering 60 units of oxytocin intramuscularly (IM) once daily on days 7 to 14 after ovulation. The other protocol does not require determining the day of ovulation, but requires administration of 60 units of oxytocin IM once daily for 29 days when treatment is started randomly during the estrous cycle. Both protocols are equally effective and induce prolonged CL function in 60 to 70% of treated mares. When mares develop prolonged CL function, the CL remains functional for 60 to 90 days. However, when using oxytocin treatment to induce prolonged CL function for estrus suppression, a longer duration of CL function would be beneficial. We hypothesized that administration of hCG during the period of oxytocin-induced prolonged CL function would extend the duration of CL function through two mechanisms: 1) a direct luteotrophic effect and/or 2) by inducing ovulation of a diestrus follicle(s) resulting in the formation of a new CL(s) that would function for an additional 60 to 90 days. Therefore, the objective of this study was to determine if administration of hCG during the period of oxytocin-induced prolonged CL function would extend the duration of CL function. Prolonged CL function was induced in 14 mares by administering 60 units of oxytocin IM once daily on days 7 to 14. Mares were randomly assigned equally to a control group that received no additional treatment and an hCG-treated group that received 2,500 units of hCG IM on days 30, 45, 60, 75 and 90 after ovulation. Jugular blood samples were collected on the day of ovulation and then three times weekly (M, W, F) for 120 days for determination of blood progesterone concentration. The duration of CL function (progesterone >1.0 ng/mL) was compared between control and hCG-treated mares using the Wilcoxon Rank Sum test. The duration of CL function was 78.0 ± 2.8 and 91.4 ± 20.4 days (mean ± SD) in control and hCG-treated mares, respectively, which was not significantly different (P>0.05). Therefore, this study found no benefit of administering hCG during the period of oxytocin-induced prolonged CL function, so alternative methods of extending the duration of CL function should be explored.

Keywords: Equine, mare, oxytocin, corpus luteum, hCG

Reference