Effect of administration of oxytocin during diestrus on the duration of corpus luteum function and estrous behavior in cycling mares

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It has been demonstrated that intramuscular (IM) administration of 60 units of oxytocin once\(^1\) or twice\(^2\) daily on days 7 to 14 after ovulation induced prolonged corpus luteum (CL) function in approximately two thirds of mares treated, making it a plausible method of suppressing estrus. The objective of this study was to monitor CL function and estrous behavior in mares for 90 days after administration of oxytocin during diestrus.

Jugular blood samples were collected every other day on days 0 (ovulation) to 30 and then three times weekly (M, W, F) until day 90 for determination of serum progesterone concentration. On day 7, mares were randomly assigned to saline-treated control and oxytocin-treated groups (n = 9/group with eight light horse breed and one heavy horse per group). Beginning on day 7, control mares received 3 cc sterile saline IM and oxytocin-treated mares received 60 units (3 cc) oxytocin IM once daily through day 14. Mares were exposed to a stallion for estrus detection on the same schedule as blood sample collection. Fifteen specific behavioral responses were recorded, six reflecting non-receptivity and nine reflecting receptivity, as the basis of judgment of ambivalent, mild diestrus, strong diestrus, weak estrus, or good estrus. Mares were considered to have prolonged CL function if progesterone remained >1.0 ng/ml continuously through day 30.

Two of nine control (22%) and six of nine oxytocin-treated (67%) mares had prolonged CL function (P=0.08). The mean (± sem) duration of CL function in the two control mares with prolonged CL function was 77.5 ± 0.2 days and in the six oxytocin-treated mares was 68.8 ± 4.1 days. In both of the control mares and one of the six oxytocin-treated mares with prolonged luteal function, estrus was not observed while progesterone remained above 1.0 ng/ml. For the remaining five oxytocin-treated mares with prolonged luteal function, weak estrus was observed during the period of elevated progesterone (11 to 65 days before progesterone was last measured above 1.0 ng/ml), which corresponded with a range of 13 to 59 days after ovulation (mean of 44.8 ± 8.4 days). In summary, oxytocin treatment effectively prolonged CL function for approximately two months in two-thirds of the treated mares, and somewhat surprisingly during the period of prolonged CL function weak estrous behavior was observed.

Keywords: Equine, mare, oxytocin, corpus luteum, estrous behavior

References