Oxytocin is an inexpensive, safe and reversible means of estrus suppression when administered on days 7 to 14 of the estrous cycle, however a related compound, carbetocin, was reported to shorten the luteal phase. To better understand the ovarian response to these related hormones a study was designed with the objective of comparing progesterone (P4) profiles in diestrus (Diest), pregnant (Preg), carbetocin (Carb) and oxytocin (Oxy) treated mares at the expected time of luteolysis. We hypothesized that Carb administration would result in premature luteal regression. Light horse mares were examined to determine if they had a normal interovulatory interval and were then examined daily in estrus until the day (D) of ovulation (D0), and then every other day during an estrous cycle using transrectal palpation and ultrasonography. Jugular blood was drawn on D12, D14 and D15, centrifuged and serum stored until assayed (Siemens Coat a Count Progesterone RIA, Los Angeles, CA). Mares were randomly assigned to treatment and studied over two estrous cycles with a rest cycle in between treatment cycles. Groups were: Diest (n=5), Preg (n=6), (bred using artificial insemination with >200 normal and motile sperm from one fertile stallion every other day in estrus), Oxy (n=6) (Oxytocin, Bimeda–MTC, Cambridge ON) 60 IU BID D7 to 14) and Carb (n=10) (T.R.C, North York, ON, Canada, 1.9 mg SID D7 to 14). Luteal tissue was sampled on either D12 and D15, or D10 and D12 as part of another study. Proprietary software (Statistix version 10, Tallahassee, FL) using p<0.05 was used to evaluate the normality of the P4 data using a Shapiro – Wilk test, and Kruskal Wallis was used to evaluate the effect of treatment and day on P4. Post hoc analysis was performed using Dunn’s all pair wise test. There was a significant effect of treatment (p=0.0000), but not time on P4 levels. The P4 levels ng/ml [median (quartiles)] by group were: diestrus [5.1 (1.0, 14.0)], Oxy [10.4 (5.5, 16.1)], Carb [0.13 (0.03, 0.90)], and Preg [10.2 (7.2, 14.4)]. The lowest P4 levels were in the Carb treated mares. An examination of the data showed that P4 levels in Carb treated mares were low at day 12. We concluded that Carb administration shortens the luteal phase by inducing premature luteolysis. The underlying basis for this effect of Carb requires further investigation.

Keywords: Carbetocin, mare, luteal, progesterone, diestrus

Reference