

Effect of oxytocin administration on luteal function, blood flow and luteolysis in Nili-Ravi buffaloes

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The objective of the study was to evaluate the effect of repeated oxytocin administration on luteal function, blood flow, and luteolysis during the luteal phase in Nili Ravi buffaloes. It was hypothesized that daily administration of oxytocin during luteal phase would induce early luteolysis and shorten the cycle length. Twelve cyclic, non-pregnant, and dry Nili-Ravi buffaloes were treated with normal saline (n=6, NS; control, 5 ml, i.m., b.i.d) and oxytocin (n=6, OT; 5 I.U, i.m., b.i.d) from Day 8 of the cycle until Day 18 after ovulation (Day 0) induction using two doses of prostaglandin 11 days apart. Follicular and luteal dynamics of buffaloes were monitored using transrectal ultrasound (7.5 MHz, MyLab 5, Esaote, Italy) daily while luteal blood flow was monitored using Doppler ultrasound from Days 14 to 18. Blood samples (Jugular venipuncture, 5 ml, EDAT tubes) were taken from each buffalo to determine the concentrations of plasma progesterone from Days 10 to 18 and prostaglandin metabolite at 0, 15, 30, 45, and 60 min after oxytocin administration (0 min) relative to the day of luteolysis (Days 14-18). Results showed no significant differences between OT and NS buffaloes regarding corpus luteum (CL) and ovulatory follicle diameters, luteal blood flow estrous cycle duration, standing estrus, onset of luteolysis, or follicular wave emergence. However, OT buffaloes exhibited larger follicle diameters on Days 9, 10, and 11, and a lower mean growth rate of CL compared to controls (0.54 ± 0.25 vs 0.78 ± 0.18 ; $P=0.046$). OT buffaloes tended to achieve peak PGFM concentration earlier than controls, with higher PGFM concentration at 0 min ($P=0.07$). Additionally, an earlier rise in PGFM concentration was observed 15 minutes before the peak in OT buffaloes ($P<0.05$). In conclusion, twice-daily oxytocin administration during the luteal phase did not result in an earlier onset of luteolysis.

Key Words: Oxytocin, Luteal phase, luteolysis, Nili-Ravi buffalo