The early conceptus and circulating blood progesterone concentrations in Caribbean jennies

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Donkeys are essential in many parts of the world. Few studies have explored the early pregnancy in jennies. The aim of this study was to describe the development of the early conceptus in jennies: day of first detection of the embryonic vesicle (EV), day of fixation, morphological changes of EV, detection of the embryo proper and heart beat, and day of emergence of the allantoic sac. Additionally, this study compared circulating blood progesterone during non-pregnant and pregnant cycles in relation to corpus luteum (CL) volume and EV diameter. Eight Caribbean jennies were monitored through four non pregnant estrous cycles via daily transrectal ultrasonography and every other day blood collection for determination of serum progesterone concentration. At estrus, the same jennies were naturally bred to a jack of proven fertility daily until ovulation (Day 0). Thereafter, daily ultrasound examinations and blood collection continued. The diameter of the EV was measured to evaluate growth rate. Day of fixation was defined as the day the embryo ceased movement and remained in the same location during sequential 10-minute examinations for 2 hours. Subsequent to fixation, daily ultrasonography was used to monitor morphological shape changes, detection of the embryo proper, fetal heart beat, and emergence of allantoic sac. Monitoring of the conceptus, CL volume and progesterone concentration ceased on day 30 of pregnancy. Six of the EV were identified on day 9 and the remaining two on day 10, with the mean diameter 2.4 mm (± 0.77 SEM). During the mobility phase, growth rate of the embryo showed linear progression at 3.75 mm/d (±0.19 SE). From day 18 to 28, growth rate plateaued and the slope was not significantly different from zero. Linear growth resumed on day 28. Fixation occurred between day 13 and 16 with the mean diameter of the vesicle 23.9 (± 0.47 SE). In 7/8 jennies, the vesicle size one day prior to fixation was less than 22 mm. Once the EV became greater than 22 mm in size, fixation occurred. This suggests that size of the vesicle is more important to fixation than day of pregnancy. Morphological changes, day of first detection of the embryo proper (mean 20.8±0.36 SE), embryonic heart beat (mean 22±0.26 SE) and emergence of the allantoic sac (mean 24.4±0.32 SE) were consistent with past studies in mares and jennies. For the first 10 days after ovulation, progesterone concentrations were significantly higher in pregnant donkeys compared to their non-pregnant cycles ($P<0.001$). From day 10 to 16, the diameter of the EV was significantly positively correlated to cumulative progesterone exposure ($P<0.0001$). Cumulative progesterone exposure up to Day 9 was higher for those jennies in which the conceptus was detected on Day 9 than in those for whom first detection was on Day 10. These results suggest that the effects of early pregnancy on luteal function occur sooner than previously thought. This is the first report of different progesterone profiles during the early pregnancy of donkeys and the first correlation between progesterone and embryo growth.

Keywords: Donkey, early pregnancy, progesterone, corpus luteum