Parturition increases serum amyloid A concentration in healthy pregnant mares
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Serum amyloid A (SAA) is a major acute phase protein and its concentrations are usually below 7 mg/L in healthy horses. However, SAA concentration can increase quickly and with larger amplitude in response to inflammation than other acute phase proteins (e.g. fibrinogen). Therefore, SAA has the potential to be a sensitive indicator of presence and magnitude of inflammatory/infectious disease during pregnancy in mares. Our hypothesis was that normal parturition would induce a rapid rise in circulating SAA in healthy pregnant mares. Objectives of the study were: 1) to determine baseline values for SAA in pregnant mares during the last eight weeks of gestation, and 2) to determine if normal parturition affects SAA concentration.

Fifteen healthy Warmblood mares between nine and 17 years of age were used in this study. Mares were inseminated with fresh or frozen semen and ovulation was detected by ultrasonography. Blood was collected weekly starting on Day 280 of gestation until parturition, and then at 12, 36 and 60 h postpartum. Blood samples were collected from the jugular vein, centrifuged at 800 g for 10 min, and the serum was collected and stored at -80°C. At the time of blood collection, mares were submitted to a physical evaluation (i.e. determination of rectal temperature, capillary refill time and respiratory and heart rates) to ascertain overall health. In addition, mares were evaluated by ultrasonography per rectum every other week to determine fetal viability and combined thickness of uterus and placenta (CTUP). Three measures of the CTUP were performed by an experienced practitioner and the average measurement was recorded. Serum concentrations of SAA were determined using a commercial ELISA kit (Tri-Delta Diagnostics Inc., Boonton Township, NJ) according to the manufacturer’s instructions for equine serum. Data were normalized for parturition date and the information obtained during the last eight weeks of gestation and 60 h post-partum were used. Data were compared by paired t-test and results expressed as mean ± sem. Significance was set at P<0.05.

During the period of observation, the CTUP significantly increased from 8.4 ± 0.6 mm (8 weeks pre-partum) to 9.7 ± 0.2 mm (2 weeks pre-partum), but values were within normal limits for this stage of gestation. As expected, the average concentration of SAA remained at baseline (i.e. <7 mg/L) during the last 8 weeks of gestation. There was a significant increase in serum concentration of SAA within 12 hours of parturition (62 ± 26 mg/L), and concentration remained elevated at 36 h post-partum (188 ± 111 mg/L). However, concentration of SAA returned to basal levels within 60 h postpartum (7 ± 4 mg/L).

In conclusion, SAA remains at baseline during late pregnancy in the mare. In addition, normal parturition induces a significant rise in SAA concentration within 36 h post-partum, but SAA levels returned to baseline within 60 h postpartum.

Keywords: serum amyloid A, horse, inflammation, pregnancy, CTUP