Non-infectious abnormal placenta and its association with obstetric and neonatal parameters in mares

Fernanda M. Pazinato, Lorena S. Feijó, Cristina G. Fernandes, Carlos E. W. Nogueira, Bruna R. Curcio

Veterinary College, Federal University of Pelotas, RS-Brazil; College of Veterinary Medicine, University of Illinois, Urbana, IL

The placenta is responsible for metabolic and gaseous exchange between mares and fetus during gestation. Any placental damage can affect fetal development and/or foal survival. The aim of the study was to describe the histopathological features of non-infectious placentas from Thoroughbred mares. Immediately after foaling, the placentas (n=148) were weighed and samples from nine placental points (cervical star, uterine body, gravid horn, non-gravid horn, bifurcation, amnion, and tree points from umbilical cord) were collected in 10% formalin, processed, and stained using hematoxylin and eosin and periodic-acid-Schiff (PAS) reagents for evaluation under optical microscopy. In addition, the following data were recorded: mare’s age, number of parturition, gestational age, third stage labor (placental elimination time), umbilical-cord length, placental weight and foal weight. Following histological evaluation the placentas were grouped into three categories: normal (n=99) - no changes were observed; vacuolated (n=30) - no pathologic findings but with intense cytoplasmic vacuolization of the epithelial areolar cells. The chorionic epithelium consisted of large cells containing vesiculated nuclei and granular cytoplasm characterized by translucent material containing eosinophilic granules, compatible with histotrophic secretory (uterine milk) glands, suggestive of the presence of mucopolysaccharides; hypoplastic (n=19) - exhibited micro cotyledonal hypoplasia or atrophy, characterized by the presence of short villi some of which had a narrow base, or lack of villi and with necrotic microcotyledons at the chorionic surface. The results for the normal, vacuolated and hypoplastic placentas were: age of mare (9.4±0.3; 13±0.8; 9.5±1), number of parturition (4.1±0.2; 6.4±0.7; 4±0.8), umbilical cord length (48±1.1, 48±1.9, 42±1.8) and placental weight (6.9±0.1; 6.8±0.2; 6.2±0.2). The other obstetric parameters, gestational age, placental elimination time and foal weight, did not differ among groups. The mares with vacuolated placenta were older and with more numbers of parturitions (p<0.05). Older mares are recognized as high risk, due to endometrial fibrosis. However, the presence of vacuolated cells indicate higher production of histotrophic secretion and suggest that these mature mares had a more integrated utero-placental unit. The mares with hypoplastic placentas had a lower umbilical-cord length and placental weight, when compared with normal placentas (p<0.05). Hypoplasia/atrophy of microcotyledons are a major cause of non-infective abortions or premature delivery. These lead to intra-uterine growth restriction and thus resulting in lower chance of neonatal foal survival. However, this was not observed in this study. It should be noted that even in non-infectious conditions placental histologic findings are associated with placental and mare parameters. In conclusion, older mares with more numbers of parturitions showed placental abnormalities and hypoplasia of microcotyledons which leads to low placental weight.

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