

EFFECT OF VASCULAR DEGENERATION ON UTERO-OVARIAN BLOOD FLOW AND PERFUSION IN THE CYCLIC MARE

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Adequate blood supply to the uterus is necessary for normal function during reproductive cyclicity and gestation in the mare. Hormonal distribution, signaling, uterine contraction, placentation and early and late gestation are vascular-dependent events. Infertile/subfertile mares with histories of chronic uterine infection and uterine biopsies of Grade III present moderate to severe vascular degeneration throughout the uterus (12/16); this presumably has a negative effect on uterine perfusion and subsequently on normal reproductive function. Our objective was to examine the effect of vascular degeneration on utero-ovarian blood flow and perfusion. Uterine blood perfusion was determined using fluorescent microspheres. When 15 μ m microspheres are injected into the left ventricle of the heart, blood perfusion to specific target organs is proportional to the number of microspheres sequestered in that organ. Mares ($n = 5$) were anesthetized and 40×10^6 fluorescent microspheres were injected directly into the left ventricle of the heart via a cardiac infusion catheter at a calibrated rate, while four different blood samples were also withdrawn from the carotid, facial, and dorsal metatarsal arteries. Mares were then euthanized and the reproductive tract was removed. Uteri and ovaries were sectioned into small pieces. Blood samples and sections were incubated in 4 M KOH for the digestion of the tissue and recovery of microspheres. The fluorescent dye was extracted with 2 mL of Cellosolve acetate and each sample was then read with a spectrofluorometer to determine fluorescent intensity and rate of blood perfusion. Degree of angiopathy and endometriosis was evaluated in full thickness sections of the uterine wall and classified for vascular degeneration depending on the severity and extent of the lesions. Four mares were injected with microspheres during diestrus. The uteruses of two mares were categorized as having a Grade I biopsy classification (Kenney classification) and normal vasculature; two other mares had moderate to severe elastosis of the vasculature and Grade III

biopsy. Uterine blood perfusion values showed a large difference between the two diestrous groups, 11.91 mL/min/100 g (control mares) versus 7.15 mL/min/100 g (mares with elastosis). This represents a difference of 40%, which appeared to be distributed throughout the uterus with maximal differences (up to 57.7%) in the distal uterine body. A uterine blood perfusion value of 7.93 mL/min/100 g was found in a single mare with normal vasculature during estrus. Blood perfusion values for the ovaries were similar in the diestrous groups, with a higher blood perfusion in the ipsilateral versus the contralateral ovary (57.5 mL/min/100 g versus 7.3 mL/min/100 g). Results suggested that blood perfusion of the uterus was decreased in mares with elastosis of the uterine vasculature and is cycle-dependent. This compromised blood flow may be responsible for some unknown causes of subfertility/infertility. Further studies are needed to confirm these findings and to assess differences in perfusion during estrus, fertility rates and treatment strategies.

Keywords: Uterus; Mare; Perfusion; Infertility; Elastosis

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ANALYSIS OF EQUINE SEMEN FOR EQUINE HERPESVIRUS 1 USING TAQMAN PCR

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Equine herpesvirus 1 (EHV-1) has been shown to be present and active in the testes, epididymides and accessory sex glands of stallions under both experimental and natural conditions. In other species, herpes viruses are known to be present and transmitted via semen and to cause infertility and abnormalities in the ejaculate. The objective of this study was to analyze equine semen for the presence of EHV-1 DNA, using a previously validated real-time Taqman PCR assay. Sperm cell morphology and cellular composition of the samples collected were concurrently evaluated.

Semen samples were collected from stallions involved in breeding programmes at local stud farms, as well as from stallions presented to the Equine Reproduction Service at UC Davis. Stallions in this