Expression of the vascular endothelial growth factor-receptor system in the porcine endometrium throughout the estrous cycle and early pregnancy

The objective of this study was to investigate the protein and RNA expression of vascular endothelial growth factor (VEGF), VEGFR-1 (fms-like tyrosine kinase, Flt-1) and VEGFR-2 (fetal liver kinase-1/kinase insert domain-containing receptor, Flk-1/KDR) in the endometrium during the estrous cycle and early pregnancy in pigs. The VEGF-receptor system was localized in epithelial and stromal cells, blood vessels, and myometrium. Western blot analysis showed higher levels of VEGF protein during the periovulatory and periimplantation periods (P<0.001, and P<0.05, respectively). Constant expression of VEGF mRNA during the cycle and significant upregulation on Days 22–25 of gestation (vs. Days 9–17; P<0.001) was observed. Stable levels of VEGFR-1 mRNA and protein were detected in the endometrium of cyclic animals. However, higher VEGFR-1 protein expression was found on Days 16–17 of the estrous cycle (P<0.01) and Days 13–15 of gestation (P<0.05). Protein expression of VEGFR-2 was elevated on Days 2–4 of the estrous cycle (P<0.001), but mRNA levels were constant during the cycle. In pregnancy, VEGFR-2 protein expression started to
increase after Day 15 (vs. Days 9–12; P<0.05), but induction of VEGFR-2 mRNA expression occurred earlier on Days 13–15. It appears from the present study that the VEGF-receptor system is regulated in a temporal and spatial manner during the estrous cycle and early pregnancy in pigs. The results suggest that VEGF-A family members are probably involved in appropriate preparation of endometrium for implantation and in vascular events during implantation in pigs.

Stichworte:
angiogenesis; VEGF; VEGFR-1; VEGFR-2; endometrium; pig

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