

Growth and Angiogenesis in the Pregnant Canine Uterus

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Investigation of local immunology of the pregnant canine uterus could be helpful to develop non-surgical contraceptive measures. During former studies, we assessed that the pregnant uterus differed from the diestrus uterus because of the expression of CD8 and interferone (IFN) γ and the absence of CD4, interleukin-6 and tumor necrosis factor- α . During implantation and only at placentation sites, mRNA for insulin like growth factor-2 and granulocyte macrophage colony stimulating factor were additionally detected, suggesting that these factors have growth-supporting and immune-modulating functions.

The aim of the present study was to investigate whether platelet activating factor (PAF), PAF-Rezeptor (PAF-R), epidermal growth factor (EGF), EGF-R, vascular endothelial growth factor (VEGF), VEGF-R1 and VEGF-R2 are expressed in the pregnant canine uterus. For this purpose, 21 pregnant bitches were ovariohysterectomized at days 10-12 (n=7), 18-25 (n=7) and 28-45 (n=7) days after mating, respectively. The preimplantation group was proven pregnant by embryo flushing of the uterus after the operation. Four non-pregnant bitches in diestrus served as controls. Tissue samples from the uterus (placentation sites, interplacental sites and horn width) were excised and snap frozen in liquid nitrogen after embedding in Tissue Tek®. Embryos and tissues were stored at -86°C until analyses. mRNA extraction for RT-PCR was performed with Tri-Reagent. For quantification, real-time RT-PCR methodology was used.

In the course of pregnancy, mainly the receptors underwent significant changes. During pregnancy, VEGF and EGF expression slightly increased during implantation and markedly decreased during placentation (n.s.), whereas PAF increased during placentation (n.s.). The course of the receptors in samples from pregnant animals was in diametrical opposition to the course of the related factors, with significant increases towards placentation concerning VEGF-R1,-2 and EGF-R ($p<0.05$), and significant decreases concerning PAF-R ($p<0.05$). In comparison to the non-pregnant samples, expression of VEGF-R1,-2 and EGF-R was much higher during placentation, whereas it was lower concerning PAF (all $p<0.05$). In the embryos, mRNA from all factors was detected.

In conclusion, the results are similar to those observed in other mammals and may be explained by an increased need for these promoters of proliferation and differentiation towards implantation. Control of local receptor expression might be more interesting as to non-surgical sterilization than manipulation of the investigated growth factors itself.