ABSTRACTS

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Is apoptosis a regulatory mechanism during early canine pregnancy?

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OBJECTIVES AND METHODS: The aim of the present study was to assess the expression of FAS and FAS-L in canine uterine tissue throughout pregnancy as well as in preimplantation embryos. The question was whether these factors regulating apoptotic mechanisms in other tissues, might be involved in the regulation of implantation in dogs. For this purpose expression of both factors was assessed by RT-qPCR and immunohistochemistry in uterine tissues of 24 healthy pregnant bitches (group I: day 10-12,n=5; group II: day 18-25,n=6; group III: day 28-45,n=6) and of bitches after induction of abortion with aglepristone.

RESULTS and DISCUSSION: In preimplantation embryos, only FAS-L but not FAS could be detected. In uterine preimplantation tissues, expression of FAS-L exceeded that of non pregnant bitches in early diestrus and then decreased significantly towards placentation (Fig 1).

Expression of FAS did not change significantly until placentation, however an increase towards implantation with a decrease thereafter was observed. Immunohistochemistry so far revealed the expression of FAS-L protein in uterine tissue of pregnant bitches. The FAS/FAS-L system, also known as CD95/CD95L or TNFRSF6, is active in many organs A defect or lack of this system may cause severe organ lesions as well as autoimmune reactions (2). During apposition and adhesion of human embryos, blastocysts actively suppress apoptosis of endometrium epithelial cells, thus facilitating successful adhesion. The phase thereafter is marked by an increased rate of apoptosis, probably induced by the FAS/FAS-L system to facilitate implantation; human trophoblast cells mainly express FAS-L, the endometrium epithelial cells mainly FAS (3). The importance of this mechanism for successful implantation is underpinned by the following studies: when mouse endometrium epithelial cells were treated with anti-FAS-antibodies, blastocyst implantation rate was significantly reduced (3). In humans, disturbance of the FAS/FAS-L system is described to cause eclampsia and abortion (4).

CONCLUSION: The here presented preliminary results point towards a regulatory function of the FAS/FAS-L system during early canine pregnancy. However, further studies investigating protein expression inside the endometrium as well as in vitro studies using blocking peptides should follow.

3Straszewski-Chavez SL, Abrahams VM.,Mor G. The Role of Apoptosis in the Regulation of Trophoblast Survival and Differentiation during Pregnancy, Endocrine Reviews 2005;26(7): 877-897.
Figure 1: Gene expression of FAS-L during pregnancy; Embryo = diestrus, non-pregnant; Preimpl. = preimplantation; Impl. = implantation; Placent. = placentation
*points with equal indices differ significantly (p<0.05)