Correlation between VEGF production and blood vessels density in steroidogenic activated pig antral follicles

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SUMMARY

Ovarian activity is characterized by alternating phases of growth and regression. This dynamic situation is paralleled by a continuous rearrangement of the blood vessels network that adequate in relation to the needs of follicular and luteal structures and their different levels of activity. Considering the potential role of angiogenesis in the regulation of folliculogenesis, the present research has been carried out in order verify whether the angiogenic mechanisms (VEGF production and blood vessels architecture and density) are involved in the process of the follicular development in term of steroidogenic production. For this purpose, follicular growth has been induced in prepuberal gilts with equine chorionic gonadotropin (eCG) and healthy antral follicles with different diameter were collected 40h later to monitor the amount of VEGF and estradiol accumulated in follicular fluid and relate these functional parameters with the follicular wall organization of the blood vessel network. The intrafollicular levels of VEGF and estradiol were evaluated by using an ELISA and radioimmunoassay respectively, while vascular endothelial cells were immunolocalized using a polyclonal antibody to anti Von Willebrand factor to describe and quantify the density of each blood vessel area (total vascular area, inner and outer network). The results of the present work demonstrated that: active follicles, hormonally stimulated to produce high levels of estradiol, increased their blood vessel network in response to a prompt production and accumulation within follicular fluid of VEGF.