Effect of Vascular Endothelial Growth Factor 165a (VEGF 165a) and Stem Cell Factor (SCF)/KIT-Ligand (KL) on Porcine Primordial Follicles Development In-Vitro.

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Abstract

Initiation of folliculogenesis through the activation of primordial follicle and their development in the female ovary plays a vital role in determining the fertility and reproductive strength of the mammals. Follicle formation and their development in the mammalian ovary is a complex process regulated by the action of the hypothalamic-pituitary-gonad axis is poorly understood. Since the factors that regulate this process are largely unknown, this study was carried out to test the short-term effect of vascular endothelial growth factor 165a (VEGF 165a) and stem cell factor (SCF) also known as KIT-ligand (KL) on porcine primordial follicles development in-vitro. Porcine ovarian cortical stripes were cultured in vitro 5% CO_2 and 95% O_2 under the humidified atmospheric conditions and were treated with different concentrations of VEGF 165a + SCF as follows. VEGF 165a 0.0 ng/ml + SCF 10.0ng/ml (Positive Control), 0.1 ng/ml + SCF 10.0ng/ml, 1.0 ng/ml + SCF 10.0ng/ml and 10.0 ng/ml + SCF 10.0ng/ml). Out of three different dose regimes tested the lowest VEGF concentration, i.e., 0.1ng/ml VEGF + 10ng/ml SCF has shown the highest numbers of viable follicles, (primordial follicles, 57.98%; intermediate follicles, 23.85%; primary follicles, 7.12% and secondary follicles 3.80%) at the end of the culture period. The highest VEGF concentration, i.e.,10ng/ml VEGF + 10ng/ml SCF showed the highest cellular degeneration (68.39%). In conclusion, it is evident that with the low concentrations of VEGF165a along with SCF increase the follicle viability whereas the highest VEGF165a concentrations implicit increased follicle degeneration.

Keywords: Follicle viability, Primordial follicle viability, VEGF, SCF, KIT-ligand

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