

Human endometrial stromal cells inhibit the pro-angiogenic stimulus of hCG in vitro

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Abstract

During embryo implantation, endometrial angiogenesis is regulated by signals originating from the endometrium itself and the developing embryo. It has been suggested that hCG may play a pro-angiogenic role; therefore, we sought to understand its regulatory role in blood vessel formation in human endometrium using in vivo and in vitro models. In the in vivo model, we screened 16 angiogenesis-related transcripts in the endometrium upon intrauterine administration of hCG. Oocyte donors were recruited and during their controlled ovarian stimulation cycle received a single dose of hCG or vehicle on the day of oocyte pick up during a cycle of ovarian stimulation. One hour before obtaining an endometrial sample, women received an intrauterine administration of vehicle or hCG (500, 1500 and 5000 IU). Transcript and protein analysis showed that MMP3 and VEGFA increased, whereas TIMP1 decreased. The in vitro analysis studied the angiogenic potential of conditioned medium (CM) from primary cultures of human endometrial stromal cells (ESC) stimulated with hCG. Using a 2D and 3D in vitro angiogenesis assays, our results indicate that CM from ESC almost completely inhibits the capillary-like structure formation in endothelial cells, overriding the pro-angiogenic effect of hCG; and this inhibition due to secreted factors present in CM specifically reduced the migration potential of endothelial cells. In conclusion, the endometrial stromal milieu seems to modulate the direct pro-angiogenic effects of hCG on endothelial cells during embryo implantation.

Palabras clave

KeyWords Plus: [HUMAN CHORIONIC-GONADOTROPIN](#); [ENDOTHELIAL GROWTH-FACTOR](#); [EMBRYO-TRANSFER](#); [IMPLANTATION](#); [SECRETION](#); [MODULATION](#); [EXPRESSION](#); [VEGF](#)

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