J. Korean Soc. Microbiol., Vol. 35, No. 5-6, 2000

Vascular Endothelial Growth Factor Expression in Human Trophoblast Cell Line

Sun-Ju Choi[1], In-Bai Chung[2], Young Kyu Lee[1], Choon-Myung Koh[1] and Joo Young Park[1]

[1]Department of Microbiology, Wonju College of Medicine, [2]Department of Obstetrics and Gynecology, Wonju College of Medicine, Yonsei University, Wonju, Korea

Embryo implantation and development are critically dependent upon the regulation of angiogenesis and localized vascular permeability. These local angiogenesis and vascular permeability is regulated by the interaction between fetal trophoblast, uterine decidua, and endothelial cells. Vascular endothelial growth factor (VEGF) may be a key mediator of these effects. VEGF has been shown to promote endothelial vascular permeability, fetal vasculogenesis and placental, fetal and maternal angiogenesis. However, the mechanism through which this regulation occurs in the placenta is poorly understood. In this study, we investigated the effects of various cytokines on VEGF expression in human fetal trophoblast.

The level of VEGF secreted by trophoblast cell line was determined using enzyme-linked immunosorbent assay (ELISA). The trophoblast cell line, cultured in the presence of IL-1β, IFN-γ or TNF-α showed significant increase of the level of VEGF in culture. VEGF secretion was most significantly increased by IFN-γ treatment but not affected by IL-2, IL-10 treatment. The level of intracellular VEGF was also increased by IFN-γ, IL-1β, TNF-α treatment. Additionally the trophoblast cell line showed an increase in VEGF mRNA levels when cultured in the presence of either IL-1β, IFN-γ, TNF-α.

These results suggest that IL-1β, IFN-γ, TNF-α may regulate the production of VEGF in early gestational trophoblasts.