

Suppression of cyclooxygenase-2 expression by leptin in cultured human granulosa-luteal cells

Tsai E.M., Chen H.S., Chang Y., Hsiao H.C., Wang C.H., Su J.H., Lee J. N.

Department of Obstetrics and Gynecology, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

INTRODUCTION: We have previously shown that serum leptin levels may be predictive of in-vitro fertilization pregnancy outcome with the effect on intra-ovarian progesterone/estradiol ratio during the follicular phase. High leptin levels were detected during the time of human chorionic gonadotropin (hCG) injection. The ovulatory LH surge (hCG mimic LH surge) appears to be essential for Cox-2 expression in the granulosa cells of the periovulatory follicle, but the regulation of the expression and activity of Cox-2 and other enzymes involved in prostaglandin synthesis in the follicle remain poorly understood. The present study is conducted to investigate leptin effect on Cox-2 expression induced by hCG in human granulosa cells.

METHOD(S): Human granulosa cells are obtained from women undergoing ovarian hyperstimulation for IVF. Protein extraction and western blot analysis for Cox-2 antibody are done. Cox-2 expression is assessed by reverse transcription-polymerase chain reaction. Granulosa cells are collected before and 24h after administration of hCG in the absence or presence of leptin.

RESULT(S): Cox-2 expression by western blot and RT-PCR is induced by hCG 1 mIU, 10 mIU, 40 mIU. Leptin has no effect on basal Cox-2 expression, however leptin (10 ng/ml, 40 ng/ml, 200 ng/ml) suppress Cox-2 expression induced by hCG 10 mIU.

CONCLUSION(S): This study shows the expression of Cox-2 is induced by hCG in human granulosa cells and indicates that leptin suppresses Cox-2 expression by hCG. The preliminary report documents one of the possible mechanism of impairment effect of leptin on granulosa cells.