The effect of estradiol on adipose tissue inflammation

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목적: It is known that premenopausal women have lower risks for cardiovascular disease compared to men, and this sex advantage for women gradually disappear after menopause. However, the mechanisms underlying these sex differences are insufficiently understood. Recent studies have demonstrated that inflammation in adipose tissue has strong impacts on cardiovascular diseases. Moreover, macrophage polarization in adipose tissue has grown to become a key player in cardio-metabolic disorder. Our aim was to investigate sex specific response of adipose tissue immune cells to high fat diet and the role of estradiol to adipose tissue inflammation.

방법: We developed C57BL/6J male, non-ovariectomized (SHAM) female, ovariectomized female, and ovariectomized female with estradiol or aromatase inhibitor to receive a normal or high fat diet.

결과: High fat diet induced adipose tissue inflammatory markers and macrophage polarization in male mice. Female mice with intact ovary were resistant to HFD induced macrophage polarization. However, T cells (CD4, CD8), dendritic cells and macrophage polarization increased in ovariectomized females mice compared to SHAM group. Estradiol supplementation normalized these inflammatory changes whereas aromatase inhibitor supplementation aggreagated these changes.

결론: Macrophage polarization and B and T cells, and dendritic cell change by estrogen deficiency may play an important role in developing cardio-metabolic disorder in postmenopausal women.

Expression of adiponectin, leptin, and their receptors in ovarian endometrioma

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목적: To evaluate the expression of leptin, leptin receptor (ObR), adiponectin, and adiponectin receptor (AdipoR) in ovarian endometriomas compared with normal endometrium, and to analyze relationships among adipokines and their receptors.

방법: Forty-four women with endometriosis and 42 age-matched women with no laparoscopic evidence of endometriosis as control subjects. Endometrial tissue samples were obtained during laparoscopic surgery. Immunohistochemical staining for leptin, ObR, adiponectin, and AdipoR was performed with the use of tissue microarray. Clinical characteristics were reviewed from the patients' medical records. The effect of leptin on the expression of adiponectin was evaluated in endometriotic cell line using real-time reverse-transcription polymerase chain reaction.

결과: Positive expression rates of leptin and ObR were significantly higher in ovarian endometrioma compared with normal endometrium, but those of adiponectin and AdipoR were similar (ovarian endometrioma vs. normal endometrium, respectively: leptin 100% vs. 59.5%; ObR 72.7% vs. 33.3%; adiponectin 31.8% vs. 42.9%; AdipoR 88.6% vs. 73.8%). Expression of adipokines and their receptors did not show any correlation with disease stage. A positive correlation was found between expression of ObR and adiponectin (correlation coefficient 0.488; $p=.001$). Leptin treatment in endometriotic cells induced mRNA expression of adiponectin.

결론: These data suggest that leptin and its receptor are induced in ovarian endometriomas, and that the leptin/ObR system regulates adiponectin gene expression in endometriotic cells.