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The effect of epidermal growth factor (EGF) and transforming growth factor alpha (TGF-α) on cellular adhesions and the expression of E-cadherin and EGF receptor in cervical cancer cell lines

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E-cadherin is the prime mediator of cell to cell adhesion in epithelial cells and its loss may be important in the epithelial cancer cell invasion and differentiation. The growth factor such as EGF has a role in the epithelial cancer invasion via EGFR. We investigated the role of EGF, TGF- α and their receptor in the regulation of E-cadherin and invasiveness of cervical cancer.

CaSki, ME-180, HT-3, C-33A, HeLa, SiHa cervical cancer cell lines were cultured and observed for morphological changes. A western blot analysis was performed for detecting E-cadherin, EGFR, and activated EGFR. The cervical cancer cell lines were treated with varying concentration of EGF and TGF-α (0, 3, 10, 30, 100 ng/ml) for different time period (0, 10, 20, 30 min, 1, 2, 4, 8, 24hr). The changes of cell morphology and expression of E-cadherin, EGFR, and activated EGFR were assessed.

E-cadherin (120 kDa) and EGFR (170 kDa) were expressed in CaSki, HT-3 and ME-180 cell line, which showed epithelial contact growth. The expression of E-cadherin was not affected after treatment with EGF and TGF- α in these 3 cell lines. Although the expression of total EGFR was decreased, the expression of activated EGFR was increased after 30 to 60 minutes of treatment, then decreased subsequently. After treatment with EGF and TGF-α for 24 hours, the expression of EGFR decreased definitely while the expression of E-cadherin decreased minimally. EGF and TGF-α changed cell morphology to fibroblastoid growth in time dependent manner.

EGF and TGF-α changed the cancer cell into more invasive character. This effect was not related with the change of amount of E-cadherin. EGF and TGF-α also down-regulate the expression of EGFR. We speculate that the functional alteration of E-cadherin related phosphorylated EGFR is more important than concentration to induce invasiveness of cervical cancer cell.

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The correlation between the proliferation of cancer cells and the expression of annexin I

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Objective. To investigate the role of annexin I in human cervical cancer, we evaluated the expression of annexin I and the relation with the proliferation of cancer cells.
Methods. By the immunohistochemical analysis and western blotting of annexin I in cervical cancer tissues, we investigated the extent and distribution of the expression of annexin I in cervical cancer tissues. To make the cells proliferate and antiproliferate, we treated the human cancer cell lines, SiHa and HeLa cell lines with tamoxifen, estradiol, and retinoic acid for 5 days. We used 3-(4,5- dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) colorimetric assay to measure the proliferation and flow cytometry to detect the expression level of annexin I, simultaneously.
Results. In immunohistochemical stain, a granular staining pattern involving the entire cytoplasm was more heavily observed in malignant lesions than normals. In western blotting, the antibodies against 35-kDa annexin I appeared to react more strongly with the lysates of cancer tissues than normal and benign tissues. In SiHa and HeLa cell lines with the treatments of tamoxifen and β-estradiol, increased expressions of annexin I were noted with the correlations of increased proliferation of cells. And with the treatments of all trans retinoic, decreased expressions of annexin I were noted with the correlation of decreased proliferation of cells.
Conclusions. The results suggest that the expression of annexin I might correlate with cervical cancer than normal and the proliferation of cancer cells.