

Effect of electric field on endometrial adenocarcinoma cell and NO secretion

X Wei (CN) [1], b L Guan (CN) [2], P Fan (CN) [3], H Bai (CN) [4]

Context

Endometrial cancer is a group of epithelial malignancies originating in the endometrium. It is one of the three most common malignant tumors in the female genitalia. In recent years, although the diagnosis and treatment levels have increased, but the tumor metastasis and recurrence after the poor prognosis. The use of cell electropositive and electrophysiological pathology may be helpful for diagnosis, the occurrence of tumor cells tend to transfer electricity, but also affect the cancer cells in the blood circulation. This new modality may have diagnostic value. Understanding and control of the biological variability of these electrical phenomena will be important in the improvement of this test. Nitric oxide (NO) is a small molecule free radical with weight of 30 Da, In vivo NO has two major physiological roles: cytotoxicity and intercellular signal transduction or messenger.

Objective

In this study, we selected ishikawa cells of the endometrial carcinoma cell line as the study object and stimulated the cells with electric field. We report for the first time that cell morphology, directional migration and permutation induced by electric field occur in comparison with normal cultured cells obvious change. We found that the electric field also has an effect on the secretion of NO.

Methods

The endometrial adenocarcinoma cells were stimulated by 200 mV / mm electric field for 4h-24h. The changes of the morphology, migration and arrangement of the cells in the control group and the electroporation group were studied by microscopy imaging system. The cell culture supernatant of the control and electrification groups were collected at each time point, the secretion of NO was measured by using the RayBio Fluorometric Assay Kit.

Main Outcome Measure

1. Stimulation of electric field in cells promote the morphology, migration, arrangement and other characteristics.
2. Electric field to promote the secretion of NO molecules in cells increased.

Result

The results of analysis showed that the expression of NO in the supernatant of the cells stimulated by 200 mV / mm electric field for 4 h, 6 h, 8 h and 24 h was higher than that of the control, at each time point increased by 15.9, 25.4, 26.6 and 40.5 times respectively.

Conclusions

EF, as an important signal, may have an important effect on endometrial adenocarcinoma cells. The increase of NO expression induced by electric field may be related to the mechanism of NOS and NO / cGMP signaling pathway.

[1] Laboratory of Genetic Disease and Perinatal Medicine?West China Second University Hospital, Sichuan University, ChengDu, [2] Laboratory of Genetic Disease and Perinatal Medicine?West China Second University Hospital, Sichuan University, ChengDu, [3] Laboratory of Genetic Disease and Perinatal Medicine?West China Second University Hospital, Sichuan University, ChengDu, [4] Laboratory of Genetic Disease and Perinatal Medicine?West China Second University Hospital, Sichuan University, ChengDu