



Calcium-activated potassium channels as potential early markers of cervical cancer

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Abstract

Cervical cancer is a major cause of cancer death in women in developing countries. Thus, novel early markers and therapeutic targets are urgently needed. Ion channels have gained great interest as tumor markers for different malignancies including cervical cancer. Actually, some years ago, we suggested Kv10.1 channel as cervical cancer early marker. Here, we studied the expression of another potassium channel, namely, the calcium-activated potassium channel KCa1.1 (KCNMA1) in cervical cancer models. Transgenic mice expressing the E7 oncogene of human papilloma virus and non-transgenic mice were treated with estradiol pellets during three or six months to induce cervical lesions. Human biopsies from patients with either noncancerous, low- or high-grade intra-epithelium lesions or cervical cancer were also studied. mRNA and protein expression were studied by real-time RT-PCR and immunochemistry, respectively. Cervical dysplasia and cervical cancer were observed only in the transgenic mice treated with estradiol for three and six months, respectively. Estradiol treatment increased KCa1.1 mRNA and protein expression in both transgenic and non-transgenic mice. However, the highest levels were observed in the transgenic mice with cervical cancer. Human biopsies from non-cancerous cervix did not display KCa1.1 protein expression. However, increased KCa1.1 protein expression was observed in the rest of the human biopsies, we observed that the higher the grade of the lesion, the stronger the KCa1.1 immune staining. These results suggest KCa1.1 channel as potential early cervical cancer marker.

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