

Abstract

In this study we investigated the effects of low intensity static electromagnetic field (EMF) causing no thermal effects, on sarcoma cells, isolated from 3, 4-benzopyrene-induced (leiomyo)sarcomas in Wistar rats and their effects when inoculated in Wistar rats. The sarcoma cells were exposed to EMF using frequencies between 10 kHz to 120 kHz of the radiowave spectrum for 45 minutes. During a 24-hours period after cancer cell exposure to EMF, no inhibition of cell proliferation appeared. In contrast, at the end of 48 hours incubation time, the cancer cell proliferation was dramatically decreased in ratio $> 95\%$. Also, the survived sarcoma cells after the exposure to EMF (2% of the total cell population exposed to EMF) showed a significant decrease to proliferate under the same culture conditions. These cells were then exposed once again to EMF for 45 minutes (totally 4 sessions of exposure) and tested using a flow cytometer. It was found that a great percentage (45%) of these cells, double exposed to EMF, was apoptotic and only a small percentage of them was found under mitosis (2 %). Additionally, the cells were counted and tested using an aggregometer for their ability to aggregate the platelets (an indicator of their metastatic potential) and they didn't show any difference in comparison to the sarcoma cells not exposed to EMF (control cells). Both, exposed and unexposed cells induced soft tissue tumors, when inoculated in Wistar rats, but mean survival time was significantly prolonged and tumor growth rate significantly reduced in the group inoculated by exposed to EMF sarcoma cells(Experimental group),in comparison to the non-exposed group(control group). Lung metastases were also reduced in the experimental group compared to the control group. Results