Abstract

The concept of breast cancer describes a wide range of serious diseases. It is one of the most common cancer diseases among women worldwide. The most difficult and problematic subtype is the triple negative breast cancer. This subtype is characteristic by the loss of expression of hormon receptors and HER-2, which makes it unresponsive to available targeted therapy. The breast cancer, as well as other malignancies, has a relationship with zinc ions. Zinc is an essencial element and it is involved in many of important cellular processes and thus it is able to directly or indirectly affect the cancerogenesis. Increased levels of zinc ions in malignant breast cancer tissue compared to healthy tissue were well described. However, zinc has documented anticancer properties. The aim of this study was to determine if excessive suplementation with zinc ions has an effect on breast cancer development *in vivo*. The cell line 4T1 was chosen as a model of the triple negative subtype in *mus musculus*. The mouse strain BALB/c was used as an animal model. A total dose of zinc sulphate per one gram of mouse weight used in the experiment was 0.15 mg. We determined not only the growth of primary tumour, but also an expression levels of selected genes and antioxidant capacity of the whole organism. The volume of primary tumour was significantly affected by the zinc suplementation, but it had no effect on the metastasis development. Zinc is able to influence the breast cancer tumourigenesis, but probably only in the early stages.