

OXIDATIVE STRESS IN BREAST CANCER

Summary

Oxidative stress may be defined as an imbalance between reactive oxygen species and the individual antioxidant defense system. Reactive oxygen species formation is a constant element of a cell's oxygen metabolism. It is now known that oxidative stress is involved in most of pathological states and diseases. Oxidative stress causes damage to important macromolecules, such as DNA, proteins, and lipids. Growing evidence indicates the participation of free radicals in the cancerous transformation of cells. The process of cancer formation and development is associated with loss of redox balance in the cell and with overproduction of reactive oxygen and nitrogen species. Actually breast cancer is the most common malignant neoplasm in women both in Poland and worldwide. It is biologically and clinically very heterogenous disease. Oxidative stress and

oxidative-nitrative changes in the cells are frequently observed in breast cancer patients, but until now mechanisms involved in the relationship between oxidative stress and breast cancer are still unclear. Oxidative stress species may also induce changes to the structure and function in hemostatic elements. Human organisms have developed several ways to protect themselves from oxidant attacks. The defense mechanisms include a variety of antioxidant enzymes like glutathione peroxidase, catalase and superoxide dismutase and other substances such as low-molecular-weight thiols, such as glutathione, cysteine and vitamins E, C and A, which provide to eliminate free radicals are very important for the development of breast cancer and during multichemotherapy with different anti-cancer drugs or pre- and postoperative radiation therapy.