THE EFFECT OF THE NEW METHOD OF NEOADJUVANT CHEMOTHERAPY ON THE OXIDATIVE PROCESSES IN PATIENTS WITH SOFT TISSUE SARCOMAS

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Aim: The aim of this study was to assess the changes of antioxidant enzymes activity and intensity of lipid peroxidation in erythrocytes of patients with soft tissue sarcoma (SST) in the early postoperative period under the influence of neoadjuvant combined chemotherapy (NCC).

Methods: The activity of Cu/Zn-superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione transferase (GST) and the content of malondialdehyde (MDA) were studied in red blood cells of 42 patients with SST (T2a/bN0M0) by standard spectrophotometric methods. 29 of the 42 patients with SST had low-grade tumors (G3) and tumor volume larger than 40 mm (60%). Twenty-one patients of experimental group received NCC comprising doxorubicin 40 mg/m² administered intravenously on the 1st and 7th day by the use of autologous red blood cells as a carrier of cytostatic drugs. Simultaneously cyclophosphamide 600 mg/m² and methotrexate 40 mg/m² were administered in peritumoral tissue on autologous plasma as a carrier. After 14 days, removal of the tumor was performed. Control group consisted of 21 patients who underwent resection only. Later all patients received postoperative standard chemoradiotherapy.

Results: Before treatment in all patients with SST SOD and CAT activity were reduced by 12-19%, the activity of GST was increased by 19%, the GPx activity and content of MDA increased two-fold compared with the level in healthy people. There were no significant changes of the studied parameters in the patients of control group in the early postoperative period. The experimental group showed increase of CAT activity by 37%, the GPx activity and MDA-level were decreased compared with the value before treatment by 44% and 34% respectively. That led to the normalization of the balance of SOD/CAT and CAT/GPx. 4-year of patients monitoring showed that local recurrence and metastasis occurred in 12 of the 21 people of control group, and in 5 of 21 in the experimental group.

Conclusions: Thus, treatment with the new method resulted in the rebalancing of the antioxidant system of erythrocyte, which led to the reduction of the oxidative stress. That contributes to decrease of tissue hypoxia and improves the effectiveness of treatment.

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