Summary

Introduction.

Neoadjuvant chemotherapy is used in patients with advanced breast carcinoma to reduce the tumor mass before the surgical treatment. Currently, information about the morphological and immunophenotypic changes (hormonal receptor status, expression of proliferation markers, HER2 etc.) after chemotherapy is available. However, there is only very limited knowledge about the changes in of the angiogenesis, infiltration of inflammatory elements or stromal reacion and about the predictive significance these factors. In addition, no reliable factors predicting success of primary chemotherapy are available.

Methods

In 73 patients treated with neoadjuvant chemotherapy (paclitaxel, doxorubicin), samples from pretreatment biopsy (core cut biopsy or cutaneous excision) and surgical specimens removed after primary chemotherapy (mastectomy, quadrantectomy) were compared. Tissue was routinely processed and stained with hematoxylin eosin and May-Grünwald-Giemsa stain. Immunohistochemicaly, alpha-smooth muscle actin (SMA) visualizing capillaries with pericytes, and myofibroblasts in stroma); CD 34 (expressed in endothelial cells of capillaries and in stromal elements); CD 31, CD 105 (capillaries); VEGF (expression in tumor cells and stromal cells); CD 68, CD 3, CD 56, CD 83, CD 1a, S 100 (expression in intraepithelial and stromal inflammatory cells in tumor); ER, PR, p53 and Ki67, were detected.

Results and discussion

From the 73 patients, ten had pathological complete response (no tumor in the posttreatment specimen).

After the chemotherapy, in situ component was more frequently found, whereas invasive growth of the tumor into the terminal ductulolobulary unit was less frequent.

The cellularity and the proliferation activity decreased – this finding is consistent with previous studies.

Certain changes in the angiogenesis after the chemotherapy were observed. The expression of VEGF decreased, the number of all capillaries increased, but the number of CD 105 positive (immature) capillaries were unchanged. Thus, the entire angiogenetic potential was not increased. These results are different from previous studies, changes in angiogenesis are probably dependent on the type of chemotherapy.

Numbers of all studied inflammatory elements (with exception of CD 68 positive macrophages) were generally increased. Inflammatory reaction could be nonspecific, but together with decreased expression of CD 34 in tumor stroma it documents changes in tumor microenvironment after the chemotherapy.

As described in previous studies, there was shown predictive significance of the expression of p53 and PR detected in the pretreatment biopsies. Higher maximal numbers of CD 83 positive intraepithelial dendritic cells, higher maximal and mean numbers of CD 3 positive intraepithelial lymphocytes in invasive tumor and lower expression of SMA in tumor stroma were more frequently found in tumors showing pathological complete response. These results document antitumor activity of lymphocytes and dendritic cells and importance of the role of tumor stroma, namely the presence of myofibroblasts.