Aim: The aim of the study was to analyze the risk factors of cardiac toxicity (CT), to extract the group of high risk of CT development and implement the preventive treatment of CT in this group.

Methods: In 146 patients with breast cancer who received 4-6 cycles of chemotherapy (CX) with FAC regimen the list of risk factors was analyzed. Among them were age, stage of BC, localization of the tumor and its metastases, morphological features of the tumor, comorbidities, number of CX cycles, genotype of GSTP1 and MTHFR genes. The clinical, laboratory and instrumental investigations (ECG and cardiac ultrasound) were performed to the patients before the start of the treatment, after every 2 cycles of CX and at the end of the treatment.

Results: The main risk factors of CT development were age >50 years old, advanced stage of BC, comorbidities, 3 and more cycles of previous CX ($p<0.001$) and T/T or C/T genotype of MTHFR gene ($p<0.01$). Patients with these factors were defined as high risk group for development of CT and were randomized to receive CT prophylaxis or not. Preventive treatment included trimetazidine alone (for patients with normal blood pressure (BP) and pulse) or in combination with beta-blocker (in patients with tachycardia) or inhibitor of angiotensin converting enzyme (in patients with elevated BP). Sinus tachycardia was observed in 8.6% in the group of patients who received CT prophylaxis vs 20% in the group without CT prophylaxis, arterial hypertension – in 10.3% vs 20%, QT interval prolongation – 25.8% vs 50.9%, ejection fraction decrease – 10.3% vs 25.5%, respectively ($p<0.05$).

Conclusions: The most significant prognostic factors of CT in patients with BC treated with FAC CX were age, stage of the disease, comorbidities, 3 and more previous cycles of CX and T/T or C/T genotype of MTHFR gene. Patients who received CT prophylaxis had lower CT levels than patients who didn’t receive CT prophylaxis.

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