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RESEARCH ARTICLE

IDENTIFIED WITH HELPHAEMOFILTER CYTOLOGICAL BLOOD TESTS INDICATIONS OF ADJUVANT CHEMOTHERAPY IN PATIENTS OPERATED ON FOR BREAST CANCER

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ABSTRACT

Issue about the need for adjuvant chemotherapy in breast cancer, until recently, only dared considering clinical patomorfologichesikh tumor properties. But now these views are changing. The article discusses research haemofilter cytological venous blood of cancer patients undergoing radical surgery. This method aims to detect in the peripheral blood of circulating cancer cells. The discovery kartsenimii is the base to assign patients to postoperative chemotherapy.

INTRODUCTION

Breast cancer is the most common malignancy among women; it ranks second in the structure of female population mortality from cancer in the world after the lung cancer (Bruce *et al*., 2008). According toIARC999000 women each year become ill with breast cancer (BC) (22% of all women's malignant tumors), and 375000 dies in the same period. 60% of patients with locally advanced breast cancer had got loco regional metastases in early stages, especially if only surgical intervention was performed as a primary treatment (Bulbrook, 1996). Patients with operable breast cancer need additional (adjuvant) drug therapy, which improves long-term outcomes, reducing the risk of disease recurrence and increasing the survival rate of patients (Burstein, 2013; Perevodchikova, 2011; Goldhirsch *et al*., 2011 and Prat *et al*., 2013). Before a decision about setting of chemotherapy was based on completely clinical pathomorphological factors, such as the stage of tumour and state of regional lymphonoduss (Bulbrook, 1996). However, last years information increases about the decision value of biology of tumour both for a prognosis and to the well-known variableness of answer for a chemotherapy (Bruce *et al*., 2008; Sorlie *et al*., 2001 and Semiglazov, 2011). In particular, as early as early works of groups of IBCSG and GALCls there was demonstrated, that some patients with hormone-receptor it is not won positive (ER+) tumours from adjuvant chemotherapy and actually resisnant to the chemotherapy, having an excellent prognosis on one endocrinotherapy (IBCSG, 2002). All factors used presently for determination of testimonies to adjuvant chemotherapy of chasse of mammary gland are based on research of primary tumour, although gradually an awareness grows and about the role of "peripheral" factor, such as circulatory in blood cancer cells.

Objective of the study

Development and research of hemofiltercytological venous blood test clinical significance in determining of indications for adjuvant chemotherapy of patients radically operated on for breast cancer.

MATERIALS AND METHODS

The study involved56 patients who underwent radical surgery for breast cancer. The age of the examined patients was from 33 to 72 years old. At the 15th and the 20th days after the operation venous blood, taken from cubital vein of 49 patients, was twice investigated by hemofilter cytological method for presence of circulating cancer cells. Before the blood test the device for venous blood micro screening had been installed. At the bottom of a glass cylinder encased in plastic casing a plastic grid with calibrated filter fixed by metal ring was placed. 9 ml of venous blood, taken independently of eating

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from ulnar vein of a patient and diluted in 1 ml of sodium citrate, was poured from the tube into the glass cylinder through the upper opening. Then all studied venous blood was passed through a calibrated filter with pores diameter 6 microns, herewith tumor cells were kept in filter residue (see Fig.1 a,b). The residue was delivered to glass slides, previously degreased and cooled. Smears were fixed by 3% Leishman's spirit solution in 2-4 minutes. Then they were rinsed by distilled water and dyed with azure-eosin mixture in3:1 ratio for 6-8 minutes. After dyeing smears were rinsed by distilled water, dried in air and viewed under a microscope.

RESULTS AND DISCUSSION

49 of 56 radically operated patients have gotcarcinemia, i.e. there were detected circulating tumor cells (CTCs) in their blood. According to the accepted standards adjuvant PCTs assigned to radically operated on for breast cancer patients in the following cases: inflammatory form of breast cancer, tumors > 5 cm, the presence of metastases in 4 or more lymph nodes, low (< 5%) or absence of hormone receptors (ER-) young age (< 35 years). In our opinion, an additional factor justifying adjuvant PCT assignment for the above mentioned category of patients is that they have postoperative carcinemia. Precisely the cancer cells presence in bloodstream causes the probability of micro, and then macrometastasis formation in distant organs. Just from the moment of cancer cells output into bloodstream the probability have been increasing. To metastasize a cancer cell must acquire the ability to survive after being hit into vessels (evade immune surveillance) and then get out of them, and multiply in an unusual for this type of cells microenvironment, giving a new source of tumor growth (Weinberg *et al*., 2008). Percentage of patients, in blood of which we identified CTCs, was 87.7. 43 patients with CTC were operated on, the techniques of surgeries is presented in Table 1.

Table 1. Types of operations undergone by patients with breast cancer

№	Volume of radical surgery	Number
1	Radical resection of mammary gland	6
2	Pirogov's mastectomy (for elderly people)	3
3	Madden's mastectomy	38
4	Patey's mastectomy	2

It's interesting for us to determine how the disease stage affects the frequency of carcinemia (see Table 2).

Table 2. Rate of detected carcinemia depending on stage of breast cancer

Cancer process stage	Number of patients with carcinemia	Percentage
I (T1 N0 M0)	0	0
IIA (T2 N0 M0, T1,N1,M0)	3	6,1
IIB (T2 N1 M0, T3, N0,M0)	8	16,3
IIIA (T0-2 N2 M0,T3 N1-2 M0)	16	32,6
IIIB (T4 N0-2 M0, any T N3 M0)	22	44,8

The table shows that the more is the disease stage, the higher is the carcinemia frequency (in absolute numbers and percentage), therefore more often the indications for adjuvant chemotherapy, aimed to prevent recurrence of the disease, occurs in such cases. 41(83,6%) of 49cancer patients with carcinemia agreed for combined treatment underwent adjuvant chemotherapy in order to improve overall and disease-free survival. The comparative analysis of results of the special treatment of patients is conducted with kartsiemiey getting adjuvant chemotherapy (I group) with giving up her (II group). All patients outlived the first year. Consequently general circannual survivability made for both groups 100%%. The relapse of disease developed in II to the group at 3 patients and at 2 in I to the group on the second year of clinical supervision, i.e. unrepeated survivability for the first year for both groups also was 100%. In I to the group by 2 with a relapse 4 was added patients, patients with a relapse on the third year of supervision i.e. three-year unrepeated survivability for the patients of getting adjuvant chemotherapy was 85,4%.In the group of patients not getting a chemotherapy three-year unrepeated survivability was 62, 5%. During three years from progress of onkoprocess died in I to the group 3 patients, and in II to the group 2 patients. Consequently, general three-year survivability made in I to the group - 92, 7%%, in II to the group - 75, 0 %. Thus, three-year general survivability and three-year unrepeated survivability for patients not getting by comparison to getting, adjuvant chemotherapy worse accordingly on 17, 7% and 22, 9%.

Findings

1. Availability and efficiency of hemofiltercytological test allows recommending it for widespread use in clinical practice, including general health services.
2. Hemofiltercytological test allows us to identify with sufficient effectiveness among cancer patients, underwent radical surgery for breast cancer, those, who have got carcinemia, which is the reason for polychemotherapy in order to improve survival.

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