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Research Article

The Role of Iron-Containing proteins in the Correctio of the Immune Status of Menopausal Women Diagnosed with Breast Cancer

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Abstract

The purpose of the study: To study the concentration of iron-containing proteins in menopausal women diagnosed with breast cancer and determine their role in the immune processes of the body.

Material and Methods: To study the concentration of lactoferrin (LF) and ferritin (F) in breast cancer (BC), their serum concentration was first determined in 109 practically healthy women (donors), aged 45 to 55 years. The average concentration of LF was 97827.1±ng / ml and F - 275±1.9 ng / ml. To study the concentration of serum LF and F in breast cancer, the object of the study was also patients aged 45 to 55 years (average age 50.7±2.6 years). Upon admission to the hospital, before the course of chemotherapy, the concentration of LF and F was determined in all patients (for the experiment, patients with a concentration of LF and F significantly lower than the general Rina norm were chosen. In total, 94 people were selected. Patients were divided into 2 groups: 49 people. - the main one, with a concentration of LF of 396.32±24.82 ng / ml and F - 26.2±1.8 ng / ml, taking basic chemotherapy + course of trecressed at a dose of 600 mg / day during the first 4 weeks of treatment, 15-30 minutes before meals. The control group consisted of 45 people (LF concentration - 337.81±28.89 ng / ml and F - 33.2±1.4 ng / ml) receiving chemotherapy alone. Also, all patients (before and after the course of chemotherapy) in the blood were determined by classical biochemical indicators of the effectiveness of treatment, such as the concentration of total protein, urea, hemoglobin, erythrocytes, leukocytes and lymphocytes of the blood.

Outcomes: It was found that in the main group, the use of tretresan in addition to basic chemotherapy caused an earlier (by 7-10 days) increase in the concentration of LF - from 396.32±24.82 to 4069.32±114.06 ng / ml and F - from 26.2±1.8 ng / ml to 439.47±16.3 ng / ml, compared with the control group - 1335.41±39.71 ng / ml and 279.47±14.3 ng / ml, compared with the control group - 1335.41±39.71 ng / ml and 279.47±14.3 ng / ml, respectively. At the same time, in the main group of patients, the following biochemical indicators normalized in the blood: the concentration of total protein, urea, hemoglobin, erythrocytes, leukocytes and blood lymphocytes.

Conclusion: Trecrezan may be recommended for the correction of the immune status of menopausal women diagnosed with breast cancer under the control of determining the concentration of LF and F in the blood serum

Keywords: Women of Menopause; Breast Cancer; Lactoferrin; Ferritin; Trecresan; Immune Status

Introduction

Purpose of the study: Study the concentration of iron-containing proteins in menopausal women diagnosed with breast cancer and determine their role in the immune processes of the body.

Material and methods: To study the concentration of lactoferrin (LF) and ferritin (F) in breast cancer (PMG), their serum concentration was initially determined in 109 practically healthy

women (donors), aged 45 to 55. Average concentration of LF made - 978±27,1 ng/ml and F - 275±1.9 ng/ml. In order to study the concentration of serum LF and F in RMW, the subject of the study was patients from 45 to 55 years of age (average age 50,7±2,6 years). At receipt in a hospital, before a chemotherapy course at all patients defined concentration of LF and F (for an experiment chose patients with concentration of LF and F is much lower than the standard norm. A total of 94 people were selected. Patients were divided into 2 groups: 49 persons - main, with concentration of LF 396,32±24,82 ng/ml and F - 26,2±1,8 ng/ml, taking basic chemotherapy course trekrezan at a dose of 600 mg/day during the first 4 weeks of treatment, 15-30 minutes before meals. The control group consisted of 45 people (concentration of LF - 337,81±28,89 ng/ml and F - 33,2±1,4 ng/ml) receiving only chemotherapy. The comparison also examined classical biochemical indicators of clinical effectiveness (concentration of total protein, urea, hemoglobin, erythrocytes, leukocytes and blood lymphocytes).

Results: It is established that in the main group trekrezan application in addition to basic chemotherapy, caused earlier (for 7-10 days) increase in concentration of LF - from 396.32±24.82 to 4069.32±114.06 ng/ml and F - from 26.2±1.8 ng/ml to 439.47±16.3 ng/ml, in comparison with group of control - 1335.41±39.71 ng/ml and 279.47±14.3 ng/ml, respectively. At the same time, classical clinical effectiveness indicators (concentration of total protein, urea, hemoglobin, erythrocytes, leukocytes and blood lymphocytes) were normalized in the main group of patients.

Conclusion: Trekrezan can be recommended to correct the immune status of menopausal women diagnosed with breast cancer under the control of determination of concentration of LF and F in blood serum.

Topicality

The central link, phagocytosis in inflammation is a system of neutrophils and mononuclear phagocytes, the interaction of which occurs through the cytokine complex and proteins of the inflammatory phase. An important role in this process is given to iron-containing proteins - lactoferrin (LF) and ferritin (F) [1-5]. Their direct or indirect participation in immune processes is shown – the lower the concentration of LF and F, the lower the "body's immune forces" [4-6]. Currently, the following functions of lactoferrin and ferritin are described. These are iron homeostasis, differentiation, and growth of cells of various types, antimicrobial protection, as well as anti-inflammatory and antitumor properties [3-7]. Immune properties of lactoferrin and ferritin are also actively studied in breast cancer. Significant changes in the immune and endocrine systems in menopausal women have a great impact on the course of the disease. From these positions, it is advisable to study the level of lactoferrin and serum ferritin in women with breast cancer, especially with chemotherapy, since there is a powerful pressure on them. To reduce such negative manifestations, it is advisable to use drugs with immunomodulatory properties, under laboratory control of the concentration of lactoferrin and ferritin. To reduce such negative manifestations, it is advisable to use drugs with immunomodulatory properties, under laboratory control of the concentration of lactoferrin and ferritin. And it can be noted that in recent years, the attention of researchers has been attracted by salts of biologically active triethanolammonium acids with the general formula $X^{-}N^{+}H(CH_2CH_2OH)_3$ - protatranes [8]. Among them, of particular importance is the first representative of this new, promising generation of pharmacological agents - trekrezan. It is known that trekrezan increases the level of lactoferrin and ferritin in the human body [1,2]. However, tracked in the immunocorrection of the patient category studied by us has not previously been used, which to a certain extent predetermines the novelty of any study and the applied value of this kind of work. This means that in the present study new data can be obtained that help to better understand the pathogenetic mechanisms of breast cancer, giving grounds for determining new possibilities for the use of the domestic drug in the development of this pathology. At the same time, the need to improve the functional state and prevent the progression of the disease, increase physical and mental performance, relieve fatigue and increase adaptive capabilities led to the choice of the topic of this study. The aim of the study is to study the concentration of iron-containing proteins in menopausal women diagnosed with breast cancer and to determine their role in the immune processes of the body.

Material and Methods of Research

To study the concentration of serum lactoferrin (LF) and ferritin (F) in breast cancer (BC), their serum concentration was first determined in 109 practically healthy women (donors), aged 45 to 55 years, i.e., menopause. All donors on the day of the examination had a doctor's conclusion - "practically healthy" (discharge). For the quantitative determination of the concentration of LF and F in blood serums, sets of reagents LACTOFERRIN-IFA-BEST and FERRITIN-IFA-BEST CJSC Vector-Best (Novosibirsk) were used. The average concentration of serum lactoferrin was 97827.1 ng / ml and serum ferritin were - 2751.9 ng / ml. To study the ±±concentration of serum lactoferrin and ferritin in breast cancer, the object of the study was patients of the same age of 45 - 55 years (average age 50.7±2.6 years). Upon admission to the hospital, before the course of chemotherapy, the concentration of lactoferrin and ferritin was determined in all patients (for the experiment, patients with a concentration of lactoferrin and ferritin are well below the generally accepted norm, i.e., with a low level of immunity. A total of 94 people were selected. Patients were divided into 2 study groups: the main (49 people) and the control group (45 people). The main group received basic chemotherapy + a course of trecrezan at a dose of 600 mg / day during the first 4 weeks of treatment, 15-30 minutes before meals. The control group received only chemotherapy. At the same time, in all groups of patients before and after the course of chemotherapy, the concentration of total protein, urea, hemoglobin, erythrocytes, leukocytes and blood lymphocytes was determined. For statistical processing of the data obtained, the programs Statistics 6, SPSS V 10.0.5., STATLAND, EXCEL-2001, Basic

Statistic were used on the PC. The reliability of the differences was determined using the student's criterion t. Between the-practical quantities, the coefficients of paired correlation correlation¬(r) were calculated, and the method of mathematical alignment was also used.

Results and Discussions

After selecting the necessary category of patients, the concentration of lactoferrin and ferritin was determined in them. In the main group, it was at the level of 396.32±24.82 ng / ml and ferritin - 26.2±1.8 ng /ml. In the control group, the concentration of serum lactoferrin was - 337.81±28.89 ng / ml, and serum ferritin was - 33.2±1.4 ng / ml. Further, when determining the concentration of serum lactoferrin and ferritin, we found that in the main group the use of twas retracted in addition to basic chemotherapy, caused an earlier (by 7-10 days) increase in the concentration of serum lactoferrin - from 396.32±24.82 to 4069.32±114.06 ng / ml and serum ferritin - from 26.2±1.8 ng / ml to 439.47±16.3 ng / ml, compared with the control group - 1335.41±39.71 ng / ml and 279.47±14.3 ng / ml, respectively. Simultaneously with an increase in the level of lactoferrin and ferritin, patients of the main group noted an earlier normalization of the main biochemical parameters of the blood (Table 1), which "affected" the improvement of the general well-being of patients, the better tolerability of cytostats Frequent complications after neoadjuvant chemotherapy were minimized.

Table 1: Concentration of LF, F and the main biochemical parameters of blood in women with breast cancer.

Laboratory Assistant Blood Counts	Patient Groups Studied				References Values
	Control Group		Core Group		
	Before Chemotherapy	After Chemotherapy	Before Chemotherapy	After Chemotherapy + trekrezan	
LF	337,81±28,89	1335,41±39,71	396,32±24,82	4069,32±114,06*	up to 1000 ng/ml
F	33,2±1,4	279,47±14,3	26,2±1,8	439,47±16,3 *	up to 350 ng/ml
About The Squirrel	58±1,4	60±1,3	59±2,6	74±1,4*	65-85 g/l
Mochivina	1,8±0,4	2,4±1,1	2,0±0,9	6,6±1,5*	2,5-8,3 mmol/l
Homoglobin	100±5,2	105±3,5	99±3,0	120±4,5*	110-165 g/l
Erythrocytes	3,5± 0,6	3,6±0,4	3,4± 0,5	4,5±1,0*	3,8-5,8 mln
Leukocytes	8,2±1,2	7,5±1,3	9,3± 1,2	6,5±2,1*	3,5-10k/mm
Lymphocytes	48±2,0	40±1,6	46±2,8	28±1,3*	30%

* $p < 0,05$

Conclusion

By the level of serum LF and F, it is possible to judge the level of immunity in this category of patients - the higher the concentration of LF and F at the onset of the disease, the higher the "immune forces" of the body. And with a decrease in immunity, a state of maladaptation develops, which leads to a weakening of the protective (immune) the strength of the body. During this period, the disease begins to progress intensively, patients weaken greatly and basic therapy, unfortunately, becomes less effective. During this period, there is a clear need to increase the immune forces and level of adaptation in this category of patients. Trekrezan, as an immunomodulator, with its apoptogenic properties, completely compensates for these missing therapeutic effects, which the results of our research prove.

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