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Background: The problem of implant-associated purulent inflammatory complications of bacterial origin in women after mastectomy and chemotherapy is associated with suppressed immunity due to the use of immunosuppressants and extensive surgical intervention [1, 2].

Keywords: prognostic markers, *Pseudomonas aeruginosa* biofilms, breast cancer.

Treatment of implant-associated purulent inflammatory complications is often challenged by antibiotic resistance of hospital strains *Pseudomonas aeruginosa* [3, 4]. Therefore, it is necessary to identify immunological markers for predicting the development of implant-associated purulent inflammatory complications that to

improve the effectiveness of therapy [5].

The aim: to determine the prognostic significance of immunological parameters in the development of implant-associated purulent-inflammatory processes caused by *Pseudomonas aeruginosa* in women after mastectomy and chemotherapy.

Methods: Microbiological (MIKROLATEST, ERBA, Lachema), microscopic (formation of biofilms and Ag-NETs were studied by laser scanning confocal microscopy), immunologic (ELISA), immunofluorescence test, statistical (Statistica 7 program) methods were used.

Results: The study found that eight immunological indicators and the density of *Pseudomonas aeruginosa* biofilms have high prognostic value for the development of implant-associated purulent inflammatory complications in women after mastectomy and chemotherapy. ROC analysis revealed a statistically significant correlation of IL-6 with IL-10 and IL-18, indicating hyperreactivity of the immune system with activation of the anti-inflammatory link of immunity. The sensitivity and specificity of the method for predicting the development of implant-associated purulent inflammatory complications based on IL-6 levels were 89.4 % and 98 %, AUC = 0.758, $p=0.0038$, confirming the diagnostic efficiency of IL-6 detection. Statistically significant correlations were also found between Ag-NETs levels and CD4+, CD8+, CD25+, IgM, and formation of biofilms. Sensitivity and specificity were 79.8 % and 84.6 %, respectively, AUC = 0.762 (95% CI 0.589-0.868), $p=0.0062$. Thus, IL-6 with a value > 20.1 pg/ml, IL-18 (>302.4 pg/ml), CD4\ CD8 (<0.87), Ag-NETs (>4.8 U), and formation of biofilms (>2.987 DU) are predictive indicators for the development of severe implant-associated purulent inflammatory complications.

Conclusions: The most accurate predictive model in regard to sensitivity and specificity is a regression model based on the study of immune status indicators, the density of *Pseudomonas aeruginosa* biofilms, and the antigen content in NETs in the early postoperative period. As predictors for the development of implant-associated purulent inflammatory complications in women after mastectomy and chemotherapy,

it is recommended to use IL-6, IL-10, IL-18, CD4+\ CD8+, CD25+, IgM, Ag-NETs, and formation of biofilms. Determination of NETs in women with implant-associated purulent inflammatory complications caused by *Pseudomonas aeruginosa* has prognostic significance for the success of reimplantation.

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