

Congress Abstract

Neutrophil Extracellular Traps as a Potential Marker of Neoadjuvant Endocrine Therapy Efficacy in Breast Cancer

Aigerim Omar^{1,2}, Nailya Kabildina¹

1Department of Oncology and Radiation Diagnostics, «Karaganda Medical University» Non-profit JSC, Karaganda, Kazakhstan

2Multidisciplinary Hospital No. 3 of Karaganda, Karaganda, Kazakhstan

Proceedings of International Scientific and Practical Conference "ONCO FUTURE KAZAKHSTAN 2026: Precision Oncology Theranostics, Artificial Intelligence," September 24-26, 2026, Astana, Kazakhstan

Corresponding author's email:
omar.aigerim30@gmail.com

Copyright: By the author(s).

License: A non-exclusive license by the publisher. Published by Australasia Publishing Group LLP (Astana, Kazakhstan) on behalf National Research Oncology Center.

Open Access: This article is an open access article distributed under the terms and conditions of the CC-BY Creative Commons Attribution license

<https://creativecommons.org/licenses/by/4.0>



Introduction: Neutrophil extracellular traps (NETs) are web-like structures composed of decondensed chromatin and neutrophil granule proteins. Accumulating evidence suggests that NETs are involved in tumor progression, invasion, and metastasis in breast cancer. Therefore, investigating changes in NET formation during anticancer therapy and their potential use as a marker of treatment efficacy is of particular interest.

Objective: To evaluate the dynamics of induced NET formation during neoadjuvant endocrine therapy (NET) in patients with hormone receptor (HR)-positive breast cancer and to determine its association with changes in primary tumor size.

Materials and Methods: The study included 50 patients with stage II–III HR-positive breast cancer who received neoadjuvant endocrine therapy for 3–6 months. Endocrine therapy included letrozole and toremifene (Fareston); in a subset of patients, toremifene was combined with ovarian suppression using triptorelin (Diphereline). Induced NET formation in peripheral blood was assessed using the method developed by I.I. Dolgushin with pyrogenal stimulation, followed by May–Grünwald azure-eosin staining and microscopy. NET-forming neutrophils were counted per 100 neutrophils. Primary tumor size was assessed by ultrasonography (US) and mammography (MMG). Statistical analysis included the Wilcoxon signed-rank test, Friedman test, and Spearman's rank correlation.

Results: In the three-time-point analysis of patients with serial measurements (n=32), the median number of induced NETs was 2 [0; 15] at baseline, 0 [0; 1.5] after 3 months, and 2 [0; 6] after 6 months of neoadjuvant endocrine therapy; the overall change did not reach statistical significance (p=0.051). After 3 months of treatment, a reduction in primary tumor size was observed. On US, the median tumor size decreased from 25.0 [22.0; 36.25] to 21.0 [18.0; 27.25] mm (p<0.001), while on MMG it decreased from 29.0 [21.5; 36.5] to 24.0 [18.0; 30.5] mm (p=0.049). The median relative reduction was 16.0% and 11.8%, respectively. No statistically significant correlation was found between changes in NET formation and the percentage change in tumor size after 3 months: US, $r_s=0.139$, p=0.351; MMG, $r_s=0.015$, p=0.918.

Conclusion: Changes in induced NET formation were observed during neoadjuvant endocrine therapy, with the lowest values recorded after 3 months of treatment. However, no association was established between changes in NET formation and the degree of primary tumor size reduction. These interim findings do not support the use of induced NET dynamics as a standalone marker of radiological response to neoadjuvant endocrine therapy and warrant further evaluation in a larger cohort.

Keywords: Breast Cancer; Neutrophil Extracellular Traps; NETs; Neoadjuvant Endocrine Therapy; Biomarker; Treatment Response