

## Pretreatment Absolute Neutrophil-to-Lymphocyte Ratio (NLR) Predict the Risk for Febrile Neutropenia in the First Cycle Adjuvant Chemotherapy for Breast Cancer

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### Abstract

**Background:** Chemotherapy-induced febrile neutropenia (FN) is a condition affecting mortality and morbidity. The records show that absolute neutrophil-to-lymphocyte ratio (NLR) is associated with the cancer prognosis and reflects the immune response system on the infection. It can be used as an independent prognostic biomarker and predictive marker in patients with chronic inflammatory diseases, cardiovascular diseases, or malignancies. Therefore, we have been conducted on using absolute NLR to predict FN in a patient with breast cancer who has adjuvant chemotherapy.

**Materials and Methods:** The authors retrospectively evaluated the pretreatment absolute NLR of patients with early stage breast cancer who had adjuvant chemotherapy. Then, the relationship to FN was analyzed by using multivariate logistic regression analysis.

**Results:** We conducted a retrospective analysis of 339 patients where 21 patients had developed FN (6.19%). The multivariate logistic regression analysis results indicated that the pretreatment absolute NLR cut-off point equal to or greater than 2.4 was a significant independent predictive biomarker of the chemotherapy-induced FN (odds ratio = 2.810, 95%,; CI 1.061 - 7.442;  $p = 0.038$ ). The predictive performance of the high level of absolute NLR was an acceptable discrimination [AUC= 0.7626 (95% and CI 0.650 - 0.875)]. Furthermore, a calibration curve and the Hosmer-Lemeshow test to assess the accuracy of the predictive model showed a goodness of fit for a logistic predictive model (Hosmer-Lemeshow  $\chi^2 = 2.50$ ;  $p = 0.645$ ).

**Conclusions:** Pretreatment absolute NLR would be a useful predictive biomarker for febrile neutropenia after the first cycle of adjuvant chemotherapy for breast cancer that would be simple and easy to integrate in daily practice without extra costs.

**Keywords:** Biomarker- NLR- Chemoprevention- Breast cancer