

Predictive and Prognostic Role of Neutrophil to Lymphocyte Ratio in Rectal Cancer: A Case Control Study with Propensity Score Analysis

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Abstract

Background: Neutrophil to lymphocyte ratio (NLR) is promoted as a marker reflecting the anti-tumoral inflammatory response. Herein, we aim to assess whether NLR at the time of diagnosis can predict response to neoadjuvant therapy and long-term survival in a matched cohort of rectal cancer patients.

Methods: This is a case control study on rectal cancer patients who underwent standard oncological treatment and had NLR sampled at each stage. ROC curve was used to establish the cut off value of NLR at diagnosis. Two groups (high and low NLR) were compared. Kaplan Meier overall and disease-free survival (DFS) analysis was done comparatively between two groups of patients: low and high NLR. Pearson and Log Rank tests were used to establish statistical significance. Propensity score matching (PSM) was performed, and all variables were compared again on the matched subgroups.

Results: One hundred patients were included and 54 were compared again after PSM. NLR at diagnosis did not correlate with tumor regression grade ($p=0.77$). High NLR at diagnosis ($NLR > 2.58$) was not found to be significantly associated with worse overall survival ($p=0.096$) or DFS ($p=0.128$). Similar results were achieved after PSM, except when stage III subgroups were compared, where higher NLR was associated with worse DFS ($p=0.04$), while results for OS were borderline ($p=0.05$).

Conclusions: Overall, a pretherapeutic high NLR (> 2.58) was not found to predict survival or response to neoadjuvant therapy in patients with rectal cancer. However, a higher NLR may be associated with worse outcomes in advanced colorectal cancer.

Key words: rectal cancer, neutrophil to lymphocyte ratio, inflammation, survival, radiotherapy