

Prognostic Value of Neutrophil-to-Lymphocyte Ratio in Therapy Selection for High-Risk Stage II Colon Cancer

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Abstract

Background/Objectives: The benefit of adjuvant chemotherapy in high-risk, microsatellite stable (MSS) stage II colon cancer remains controversial. Current guidelines rely primarily on histopathologic risk features, but systemic inflammatory markers such as the neutrophil-to-lymphocyte ratio (NLR) may provide additional prognostic insight. This study aimed to evaluate the role of preoperative NLR in predicting disease-free survival (DFS) and guiding treatment selection between oxaliplatin-containing and fluoropyrimidine monotherapy regimens.

Methods: We retrospectively analyzed 57 patients with high-risk stage II MSS colon cancer who underwent curative resection between 2013 and 2023. Patients were stratified by preoperative NLR (<3 vs. ≥ 3) and received either fluoro-pyrimidine monotherapy or an oxaliplatin-based regimen (FOLFOX or CAPEOX). Multivariate Cox regression and Kaplan–Meier survival analyses were performed to assess recurrence risk and treatment outcomes.

Results: An NLR ≥ 3 was independently associated with increased recurrence risk (HR: 3.22, 95% CI: 1.97–4.57, $p=0.001$). Among patients with high NLR, those treated with oxaliplatin-based regimens had a longer median DFS (81 vs. 67 months) compared to monotherapy. In contrast, NLR <3 patients showed excellent outcomes regardless of treatment choice. No grade 4 toxicities were reported.

Conclusions: Preoperative NLR is a strong and independent prognostic marker in high-risk stage II MSS colon cancer. Patients with high NLR appear to benefit more from oxaliplatin-containing adjuvant chemotherapy, potentially due to its immunogenic effects. NLR may serve as a simple, cost-effective tool for refining adjuvant therapy decisions in this challenging patient population.

Keywords: neutrophil-to-lymphocyte ratio, stage II colon cancer, microsatellite stable, adjuvant chemotherapy, oxaliplatin, immunogenic cell death, prognostic biomarker, systemic inflammation, CAPEOX, FOLFOX