THE PROGNOSTIC ROLE OF NEUTROPHIL-TO-LYMPHOCYTE RATIO (NLR) IN MAXILLOFACIAL SURGERY AMONG PATIENTS WITH HEMATOLOGICAL MALIGNANCIES: A MULTI-CENTER RETROSPECTIVE STUDY

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Introduction

- Patients with haematological malignancies undergoing maxillofacial surgery represent a clinically complex and immunologically vulnerable population.
- Systemic inflammatory biomarkers, particularly the neutrophil-to-lymphocyte ratio (NLR), have emerged as potential prognostic indicators in both solid and hematologic malignancies. However, the predictive utility of NLR in perioperative outcomes and long-term prognosis for maxillofacial surgical interventions in this subgroup remains under-explored.

Aim

To evaluate the prognostic role of preoperative NLR on surgical outcomes in patients with hematological malignancies undergoing major maxillofacial surgery.

Methods

- Across 5 academic centers, we conducted a retrospective analysis of patients who had confirmed diagnosis of hematological malignancy (acute leukemia, lymphoma, or multiple myeloma) and underwent reconstructive or ablative maxillofacial surgery from 2018 to 2024.
- Preoperative NLR was calculated from the collected complete blood count by dividing absolute neutrophils to lymphocytes.
- Patients were stratified into two groups: normal NLR (less than 4) and high NLR (more than or equal to 4).
- Clinical outcomes included 30-day postoperative complication rate, incidence of infection, and 1-year overall survival (OS).
- Associations between NLR and OS were evaluated using Cox regression models.

Results

- We identified a total of 187 patients with quantified NLR within 30 days before their maxillofacial surgical intervention.
- 58 patients (31%) had high NLR.
- The demographic and baseline characteristics were similar between both groups.
- High NLR was associated with a significantly increased rate of postoperative complications (27.4% vs 14.2%: p<0.001), surgical site infections (18.4 %vs 9.7%; P=0.002) and longer hospital stays.
- One-year OS was significantly lower in the high-NLR group (59.8%) compared to the low-NLR group (78.5%) with a hazard ratio (HR) for mortality of 1.8 (95% CI: 1.68–3.49; p = 0.01).
- After adjusting for age, hematological malignancy type and performance status, high NLR was an independent predictor factor for inferior outcomes.

	High NLR	Normal NLR
Number of patients	58 (31%)	129 (69%)
Median age at diagnosis	54 years	59 years
postoperative complications	27.4%	14.2%
surgical site infections	18.4%	9.7 %
One-year OS	59.8%	78.5%

Table 1: clinical characteristics and outcomes in both groups

Summary

High preoperative NLR is an independent prognostic factor associated with inferior surgical outcomes in patients with hematological malignancies undergoing maxillofacial procedures. Larger cohorts are warranted to incorporate NLR into preoperative risk assessment to improve stratification and guide perioperative planning in this group of patients.

References

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