

# High Pre-Treatment Neutrophil-to-Lymphocyte Ratio is Associated with Poor Distant Metastasis-Free Survival in Patients with Soft Tissue Sarcoma of the Extremity

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## PURPOSE/OBJECTIVE(S)

Localized soft tissue sarcoma (STS) is often managed with radiation and surgery +/- chemotherapy. Despite excellent local control rates, the incidence of distant metastasis is over 30%. Reported factors correlating with distant control remain variable, however.

Inflammatory response has been shown to affect disease course and clinical outcome in several malignancies. The neutrophil/lymphocyte ratio (NLR) is a marker for immune response to various stimuli including cancer.

The goal of this study was to determine whether the NLR is a prognostic marker for distant metastasis-free survival (DMFS) in patients with localized STS of the extremity.

## MATERIALS & METHODS

Between 2000 to 2019, patients with stage I-III localized STS of the extremity were retrospectively reviewed. Demographics, tumor characteristics, and treatment variables were identified.

Absolute neutrophil and lymphocyte counts within 1 month prior to the initiation of treatment were recorded. NLR was calculated by dividing the absolute neutrophil count by the absolute lymphocyte count.

DMFS was evaluated using the Kaplan-Meier estimate. Univariate (UVA) and multivariate (MVA) analyses were performed to determine prognostic variables. For MVA, the Cox proportional hazards model was used. ROC analysis was performed to assess the cutoff associated with DMFS.

## RESULTS

- Data characteristics are shown in Table 1
- On UVA, high pre-treatment NLR ( $p=0.0002$ ), smoking ( $p=0.007$ ) and stage ( $p=0.04$ ) were associated with decreased DMFS
- On MVA, high pretreatment NLR ( $p=0.0005$ , 95% CI 1.616-5.511) and smoking ( $p=0.004$ , 95% CI 1.323-4.285) remained associated with poor DMFS
- On ROC analysis, an NLR value of 3.2 was determined to best discriminate between DMFS. The 2-year DMFS for patients with  $NLR \leq 3.19$  was 81% versus 55% in patients with  $NLR > 3.19$  (Figure 1)

N	162
Median Follow-Up	4.1 years
Median Age	58 years
Median NLR	2.82

Table 1. Data characteristics

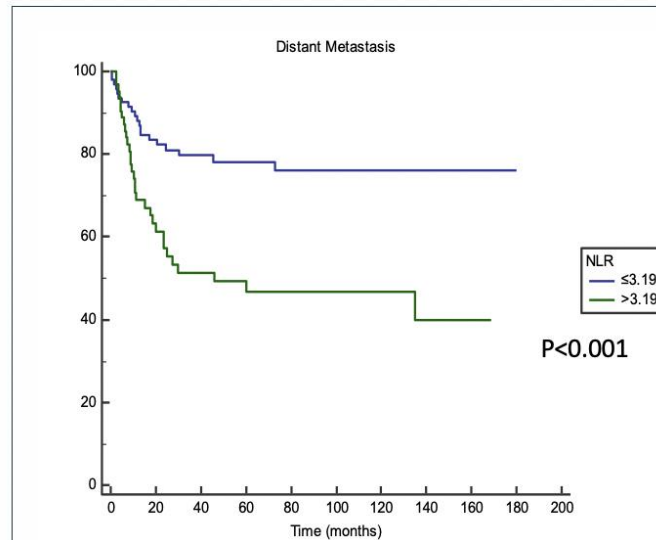


Figure 1. 2-year DMFS for patients with  $NLR \leq 3.19$  versus  $> 3.19$ .

## SUMMARY/CONCLUSION

High pre-treatment NLR ( $> 3.19$ ) was associated with decreased DMFS in patients with localized STS of the extremity and may be a convenient biomarker correlating with poor prognosis in this rare cancer.

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