



UNIVERSITAS UDAYANA

Inflammatory Markers (Lymphocyte-Related Ratio) and Polysubstance Use Severity: Insights from Bali Mental Hospital Rehabilitation Study

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BACKGROUND

Substance use disorders (SUDs) are a global health issue, contributing significantly to morbidity and mortality.

Chronic polysubstance use including methamphetamine, amphetamine, marijuana, alcohol, opioid, and tobacco could exacerbates systemic inflammation, which is associated with addiction severity.

Lymphocyte-related ratios:

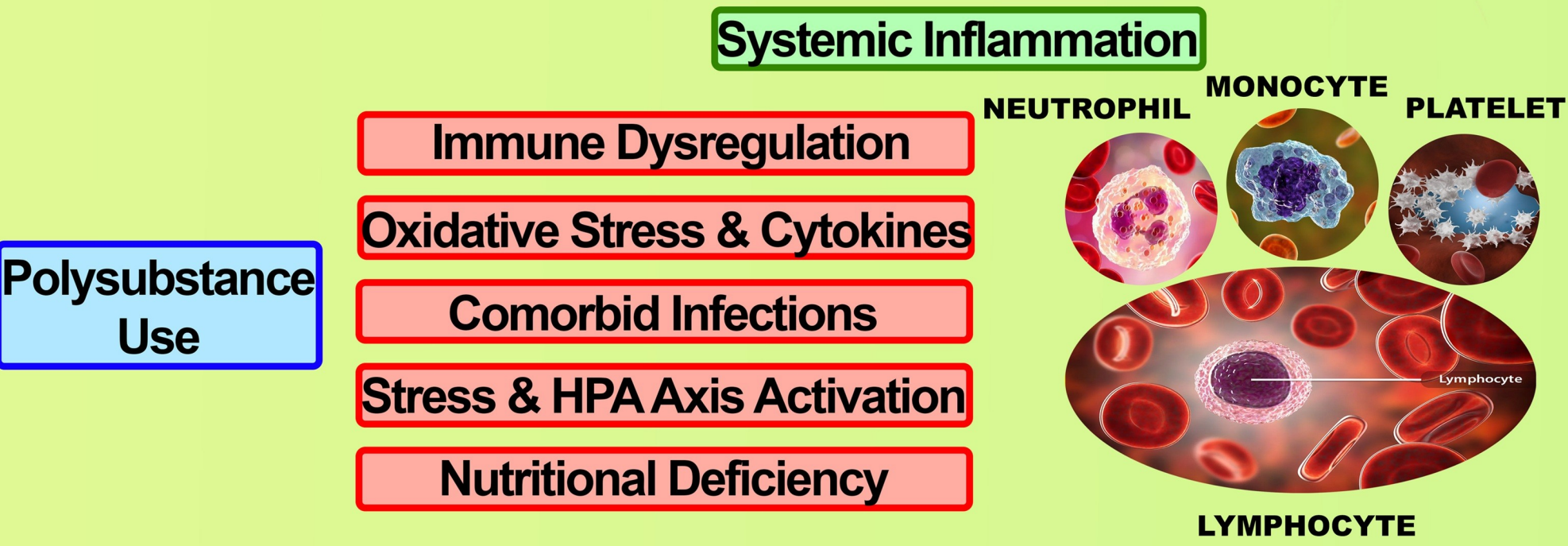
1. Neutrophil-to-Lymphocyte Ratio (NLR),
2. Platelet-to-Lymphocyte Ratio (PLR), and
3. Monocyte-to-Lymphocyte Ratio (MLR),

have emerged as potential biomarkers for inflammation.

Objective:

Investigate the association between inflammatory markers (NLR, PLR, MLR) and the severity of substance use.

- a. evaluate the levels of NLR, PLR, and MLR
- b. determine the relationship NLR, PLR, and MLR with addiction severity
- c. identify cutoff points for NLR, PLR, and MLR in predicting severity



METHODS

Cross-Sectional Study Bali Mental Hospital

Participants

105 patients
Inpatient with polysubstance use.

Inclusion: Aged 18–60 years, confirmed polysubstance use, ASI>3
Exclusion: Active infections, autoimmune or chronic disease

Two Comparative Groups

Moderate and Below
(ASI 4–5)

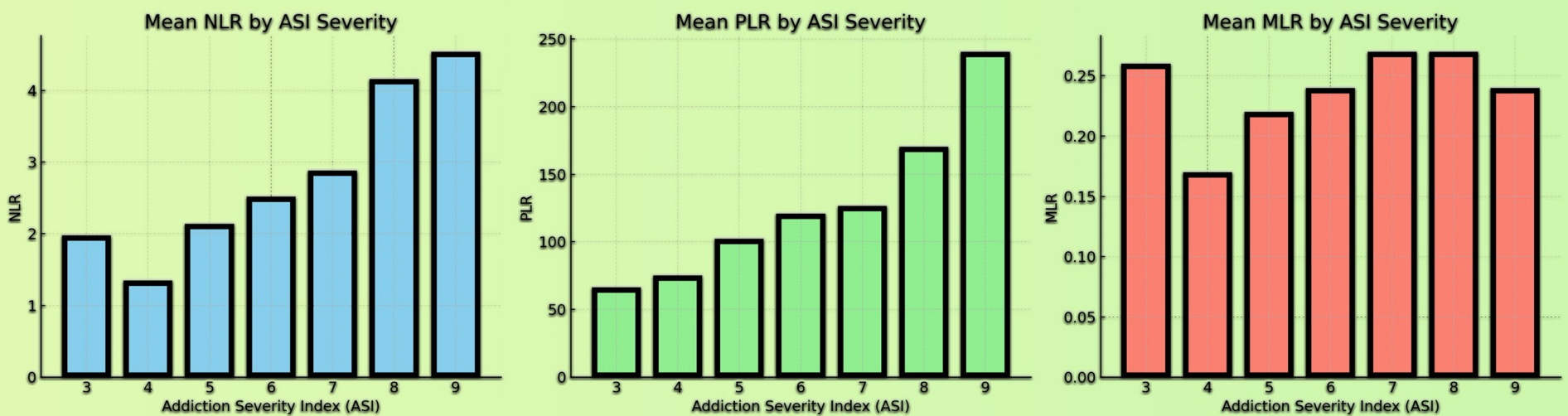
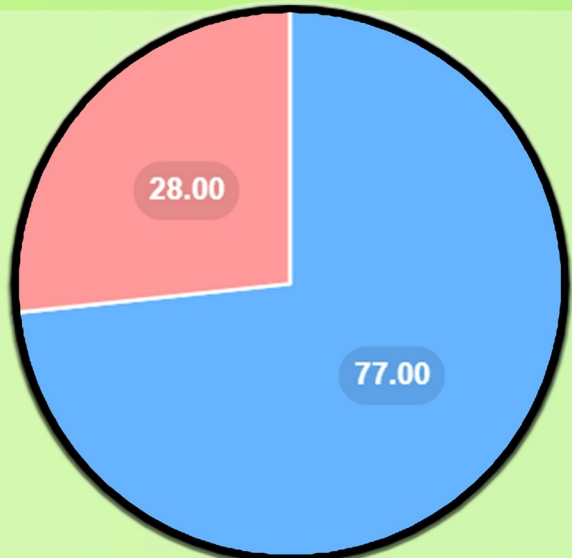
Severe and Above
(ASI 6-9)

Statistical Analysis

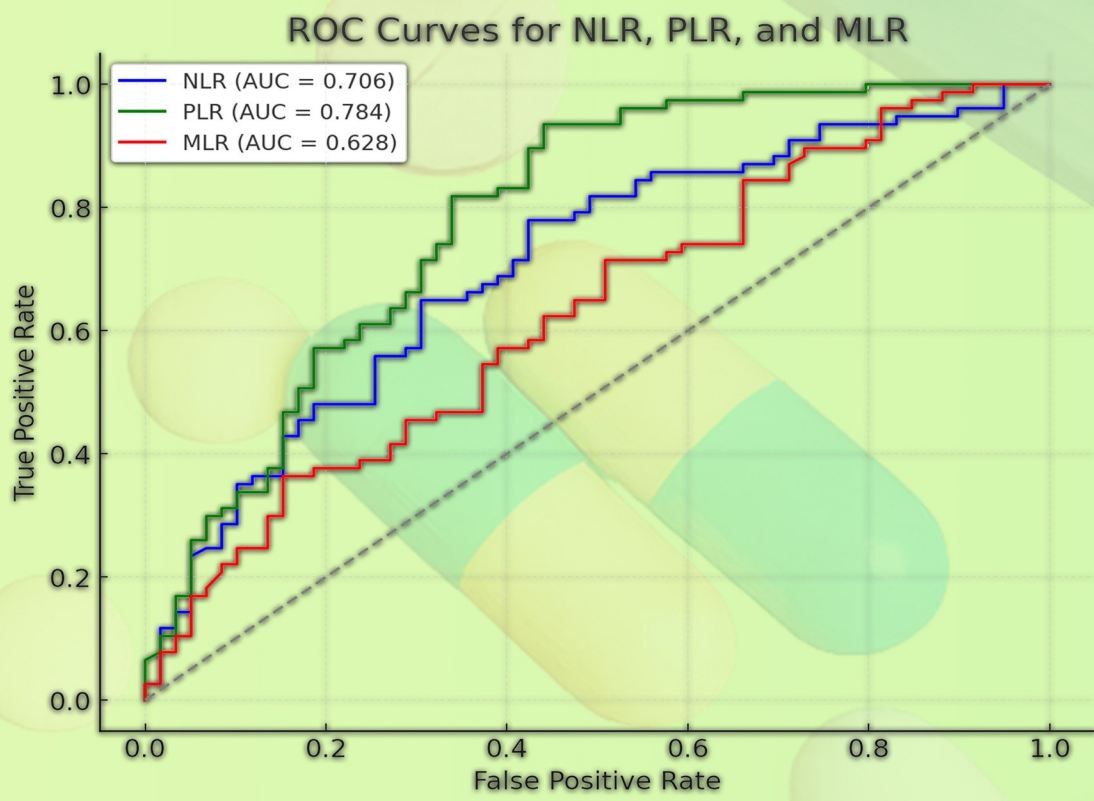
Kruskal-Wallis and ANOVA for Comparison
ROC analysis for Cutoff

RESULTS

105 participants divided into two Groups
Severe and Above (ASI 6–9):
77 participants (73.3%)
Moderate and Below (ASI 4–5):
28 participants (26.7%)



Inflammatory ratios increased with addiction severity:
NLR rose progressively (mean $\Delta = 0.7$, $p < 0.001$)
PLR showed the steepest rise (mean $\Delta = 40$, $p < 0.001$)
MLR demonstrated moderate variation (mean $\Delta = 0.2$, $p < 0.01$)



ROC analysis:

- PLR had the highest diagnostic accuracy (AUC = 0.784, cutoff ≈ 91)
- NLR showed good accuracy (AUC = 0.706, cutoff ≈ 1.8)
- MLR showed weaker performance (AUC = 0.628, cutoff ≈ 0.2)

DISCUSSION

Implication:
NLR and PLR can serve as practical biomarkers to stratify addiction severity and support individualized rehabilitation.

Novelty:
Demonstrates PLR as the strongest diagnostic marker among lymphocyte-related ratios in substance use disorders.

Strength:
First study in Bali linking lymphocyte-related ratios with polysubstance use severity using ROC analysis.

Limitation:
Single-center, cross-sectional design with limited generalizability.

CONCLUSION

NLR and PLR are reliable markers for assessing substance use severity.

Their integration into clinical practice may enhance diagnostic precision and support personalized treatment strategies in addiction rehabilitation.

SCAN
FOR
REFERENCE

