

## **Relationship between neutrophil to lymphocyte ratio and microvascular complications among type 2 diabetes mellitus patients attending the Teaching Hospital Jaffna**

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**Introduction and Objectives:** Diabetes Mellitus (DM) is a systemic disease that can lead to serious microvascular complications. The role of subclinical vascular inflammation in the pathogenesis of microvascular complications of type 2 DM and the use of hematological indices as predictors of inflammation was already reported. However, the relationship between Neutrophil to Lymphocyte ratio (NLR) and microvascular complications of type 2 DM is yet to be studied. This study aimed to determine the relationship between NLR and microvascular complications among type 2 DM patients attending the Diabetic Center, Teaching Hospital Jaffna.

**Methods:** This study was carried out among 235 confirmed type 2 DM patients from July 2021 to August 2021. Participants were selected based on the systematic sampling technique, and blood samples were collected into EDTA anticoagulated tubes. History of microvascular complications was collected by referring respective patient's clinical record book. The manual differential count was performed to obtain relative neutrophil and lymphocyte percentages from which the NLR was calculated. Based on the NLR value, patients were categorized into four quartiles, and the occurrence of diabetic retinopathy, neuropathy, and nephropathy was compared between quartiles. The predictive capability of NLR as a marker of microvascular complications was assessed by Receiver Operating Characteristic (ROC) curve analysis.

**Results:** Among 235 subjects with a mean age of 56.82±11.65 years, 131 (55.7%) were female, and 104 (44.3%) were male. Patients in higher NLR quartiles (Q4 and Q3) had higher statistically significant occurrence of diabetic retinopathy (p=0.005), neuropathy (p<0.05), and nephropathy (p<0.05) when compared to the lower quartiles (Q2 and Q1). Further, statistically significant differences were observed on comparing mean NLR between groups with and without diabetic retinopathy (p=0.007), neuropathy (p<0.05), and nephropathy (p<0.05). Based on the ROC curve analysis, NLR was a better predictor of neuropathy (AUC 0.797; 95% CI 0.737-0.856) followed by nephropathy (AUC 0.758; 95% CI 0.693-0.823) and retinopathy (AUC 0.633; 95% CI 0.537-0.728).

**Conclusion:** NLR could be useful as a readily available alternative predictive marker for microvascular complications in resource-poor settings.

**Keywords:** Diabetes Mellitus, Neutrophil to Lymphocyte ratio, Diabetic retinopathy, Diabetic neuropathy, Diabetic nephropathy.