

To Study the Outcome of Neutrophil to Lymphocyte Ratio as A Marker of Disease Severity in Chronic Obstructive Pulmonary DiseaseYash Devgan¹, Sanjiv Maheshwari², Yadram Yadav³, Kavin Kumar⁴, Anil Sankol⁵, Gaurav Arora⁶¹Resident Doctor, MD General Medicine, Jawahar Lal Nehru Medical College, Ajmer (Rajasthan)²Senior Professor, Department of General Medicine, Jawahar Lal Nehru Medical College, Ajmer (Rajasthan)³Assistant Professor, Department of General Medicine, Jawahar Lal Nehru Medical College, Ajmer (Rajasthan)⁴Resident Doctor, MD General Medicine, Jawahar Lal Nehru Medical College, Ajmer (Rajasthan)⁵Resident Doctor, MD General Medicine, Jawahar Lal Nehru Medical College, Ajmer (Rajasthan)⁶Resident Doctor, MD General Medicine, Jawahar Lal Nehru Medical College, Ajmer (Rajasthan)

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Corresponding author: Dr. Anil Sankol

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Abstract:**Background:** Neutrophil to lymphocyte ratio (NLR) is an effortless and basic parameter that is readily obtained from the simplest and easy obtainable complete blood count, even in peripheral hospitals. One of the inflammatory markers in COPD is NLR and also has its relationship between many diseases like, cardiovascular disease, kidney disease, etc.**Methods:** Patients with Chronic Obstructive Pulmonary Disease attending OPD and casualty, Department of Medicine, JLN Medical College, Ajmer, Rajasthan was included in the study, based on the inclusion and exclusion criteria. The study was done after getting informed signed consent from the patients participated in the same.**Results:** In the present study the mean value of 2.03 ± 0.47 in the gold of group in mild. the mean value of 2.58 ± 1.05 , in the gold of group in moderate. the mean value of 4.29 ± 1.19 in the gold of group in severe. the mean value of 5.08 ± 0.86 , in the gold of group in very severe. The P value – 0.001 is significant.**Conclusion:** Neutrophil lymphocyte ratio is a blood parameter which is easily obtained, and is significantly raised in acute exacerbations of COPD, based on its severity of exacerbation. Those who had more the ratio of NLR indicates more severe the disease. The prognosis and survival rate will be poor in high NLR ratio patients and these patients can be picked up early with the simple investigation.**Keywords:** Neutrophil, Lymphocyte, Chronic Obstructive Pulmonary Disease (COPD).

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Introduction

Chronic obstructive pulmonary disease is regarded as the most important public health problem that affects our part of the world. It is the third leading cause of mortality in the world, and by 2020 It became the next cause next to ischemic heart disease and stroke as per WHO COPD mostly affecting males, who are mainly smokers and characterized by limitation of airflow which is not fully transformable to normal, along with increased long term inflammatory response in airways of the tracts of lungs, being viral and bacterial pathogens as the prime cause of exacerbations. Macrophage and cells lining the mucous membrane activation which produce proteinases and chemokines [1] which attract other inflammatory and immune cells, interleukin 8 (IL8), and TNF alpha are released in turn cause attraction of neutrophils to the site are

the main reasons of inflammation that is occurring in COPD. [2] Neutrophil to lymphocyte ratio (NLR) is an effortless and basic parameter that is readily obtained from the simplest and easy obtainable complete blood count, even in peripheral hospitals. Inflammation is regarded as a set of interactions between and among immune related cells such as lymphocytes, neutrophils which in turn lead to killing of tissues and destruction which is going on in COPD.[3-4] One of the inflammatory markers in COPD is NLR and also has its relationship between many diseases like, cardiovascular disease, kidney disease, etc.[5] In this study the association that occurs between acute disease severity in COPD and NLR is found out which help to assess the morbidity and mortality of condition without the help of costly

investigation, as NLR is easy obtainable investigation and low cost one. [6]

Materials and Methodology

Study Location: JLN Hospital Ajmer Rajasthan.

Design of Study: Cross Sectional Study.

Study Duration: One year.

Sample Size: 100 patients.

Sampling Method: Random sampling.

Study Population

Patients with Chronic Obstructive Pulmonary Disease attending OPD and casualty, Department of Medicine, JLN Medical College, Ajmer, Rajasthan was included in the study, based on the inclusion and exclusion criteria. The study was done after getting informed signed consent from the patients participated in the same.

Inclusion criteria

Stable diagnosed COPD patients of age 40 years or older who was current or ex-smokers based on clinical history and examination attending MOPD and casualty, JLN Hospital, Ajmer.

Exclusion criteria

1. Age < 40 years
2. Patients diagnosed with bronchial asthma, bronchiectasis and bullos lung disorder.
3. Patients with active pulmonary tuberculosis/Pneumonia.
4. Patients with malignancy.
5. Patients with hepatic disease, renal disease, myocardial infarction.
6. Patients with any other acute or chronic infections.
7. Patients with Diabetes Mellitus.

Statistical Methods

All the dates were entered in a data collection sheet in an Excel format and analysed using SPSS Software. Numerical values were reported using mean and standard deviation or median. Categorical values were reported using number and percentages. Probability value (p) value less than 0.05 was considered a statistically significant

Results

Table 1: Gold Grading Vs Mean Neutrophil Lymphocyte Ratio

Gold	Neutrophil Lymphocyte Ratio	
	Mean	SD
Mild	2.03	0.47
Moderate	2.58	1.05
Severe	4.29	1.19
Very Severe	5.08	0.86
P-Value – 0.001		
Significant		
Anova		

In the present study the mean value of 2.03 ± 0.47 in the gold of group in mild. the mean value of 2.58 ± 1.05 , in the gold of group in moderate. The mean value of 4.29 ± 1.19 in the gold of group in severe. the mean value of 5.08 ± 0.86 , in the gold of group in very severe. The P value – 0.001 is significant.

Discussion

A novel indicator of the body's overall inflammatory condition, the blood neutrophil to lymphocyte ratio (NLR) offers a quick, low-cost, and reliable way to detect subclinical inflammation. Acute coronary syndrome and many different types of cancers have been shown to use NLR as a prognostic predictor.[7] A key indicator of systemic inflammation is the ratio of the absolute neutrophil count to the absolute lymphocyte count (neutrophil-to-lymphocyte ratio, or NLR). A high NLR score indicates a low lymphocyte count in comparison to a high neutrophil count. Lymphocyte vascular injury happens as a result of

neutrophilia when neutrophils are present in excessive quantities. It is noteworthy that the neutrophil-to-lymphocyte ratio (NLR), an easily measurable and inexpensive laboratory index calculated by routinely analyzed leukocyte characteristics, combines the negative effects of neutrophils on endothelial damage with the antiatherosclerotic role of lymphocytes. [8] In the present study the mean NLR value was 3.83 In the study of Abir et al [9] the mean level of NLR was 7.66 ± 8.62 . There is significant difference in FEV1 of various grades and NLR in the current study. The P value – 0.001 is significant. 108 Discussions In the study of CaoYuan et al. [10] the mean levels of NLR in COPD patients was 7.92 ± 8.79 . NLR levels correlated with serum CRP levels. In the study of Ersin et al. (2014) [11] NLR was high in COPD patients compared to controls. ($P < 0.001$). NLR values showed positive correlation with serum CRP level. In the current study, we didn't assess serum CRP levels. 49% patients belonged to MMRC grade 3 in the current

study. The mean value of NLR was less (1.98 ± 0.48) in the MMRC grade 1 compared to grade 2,3 and 4. There is significant difference in mean NLR between COPD patients of various MMRC grades in the current study. (P value – 0.001)

Conclusion

Neutrophil lymphocyte ratio is a blood parameter which is easily obtained, and is significantly raised in acute exacerbations of COPD, based on its severity of exacerbation. Those who had more the ratio of NLR indicates more severe the disease. The prognosis and survival rate will be poor in high NLR ratio patients and these patients can be picked up early with the simple investigation-NLR and have to be effectively intervened and rehabilitated to decrease the mortality and morbidity and to have a good quality of life. However large cohort studies are recommended to further prove our findings.

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