

## Background

- Various markers, including the leukocyte differentials such as lymphocyte/monocyte ratio (LMR) and neutrophil/lymphocyte ratio (NLR), have been evaluated as surrogates for predictive and prognostic values in inflammatory bowel disease (IBD).
- Previous studies have only evaluated the use of these markers in Ulcerative colitis (UC) patients using anti-TNF medication.
- Our aim is to assess the association of NLR in predicting clinical response to anti-Tumor necrosis factor (TNF), anti-integrin, and anti-interleukin 12/23 therapy in patients with UC and Crohn's disease (CD).

## Methods

- We performed a retrospective analysis of adult patients over the age of 18 years with newly diagnosed IBD requiring biologic therapy at the Cleveland Clinic health system between 2015 and 2019.
- Patients with active infections, hematologic, neoplastic disorders, and autoimmune diseases were excluded.
- Descriptive and logistic regression analyses were performed.
- Patients with clinical response and continued use of biologics at 52 weeks were deemed responsive to treatment (n=29).
- Patients whose biologics were discontinued prior to 52 weeks were categorized as non-responders (n= 20).

**Table1: Baseline characteristic of the two groups**

Variable	Responders (n=29)	Non-Responders (n=20)	P Value
Age	51.45 ± 13.05	52.42 ± 17.31	0.55
Gender (Female)	51.7%	63.2%	0.43
Race			
Asian	0	5.3%	
Black	0	0	
Caucasian	93.1%	94.7%	0.82
Hispanic	6.9%	0	
Body Mass index	28.99 ± 7.4	26.62 ± 4.93	0.23
Type of IBD			0.16
Ulcerative Colitis	65.5 %	84.2%	
Crohn's disease	34.5%	15.8%	
Type of biologic			<b>0.04</b>
Anti-TNF	48.3%	78.9%	
Vedolizumab/Ustekinumab	51.7%	21.1%	
Initial lymphocyte count	1.71 ± 0.61	1.56 ± 0.95	0.51
Initial Monocyte count	0.66 ± 0.31	0.63 ± 0.30	0.75
Initial Neutrophil count	5.51 ± 3.15	5.66 ± 2.00	0.85
Initial NLR	3.64 ± 2.74	4.85 ± 2.91	0.16
Initial LMR	2.86 ± 1.12	2.59 ± 1.22	0.43
Follow up lymphocyte count	1.78 ± 0.58	1.58 ± 0.58	0.26
Follow up monocyte count	0.58 ± 0.20	0.57 ± 0.32	0.85
Follow up Neutrophil count	4.24 ± 1.31	4.47 ± 1.23	0.53
Follow up NLR	2.70 ± 1.47	3.57 ± 2.68	0.17
Follow up LMR	3.33 ± 1.32	3.39 ± 1.65	0.88
Duration of follow up	52 weeks	29.90 ± 12.53 weeks	0.99
Steroid use	58.6%	57.9%	0.96

## Results

- A total of 49 patients were included. The baseline characteristics of the two groups are mentioned in **Table 1**.
- Both groups were noted to have a higher percentage of UC patients.
- Responders were noted to have a similar number of patients on Anti-TNF (48.3%) and non-Anti-TNF (51.7%) biologics as opposed to 78.9% of non-responders on Anti-TNF medications.
- Baseline and follow-up NLR were both higher in the non-responders (4.85 ± 2.91, 3.57 ± 2.68 resp.) when compared to responders (3.64 ± 2.74, 2.70 ± 1.47 resp.)
- On logistic regression, the need to switch treatment was noted to be statistically significantly related to both initial NLR (OR=1.58 95% CI= 1.07-2.34; p=0.02) and follow-up NLR (OR=2.38 95% CI= 1.07-5.27; p=0.03) when controlled for confounding factors (steroid use, IBD type, and type of biologic).

## Conclusions

- This is the first study supporting the use of NLR as an inexpensive, non-invasive marker for clinical response in patients with Crohn's disease as well as patients on non-anti-TNF biologics.
- Our results demonstrate that the absolute NLR at baseline and follow-up is higher for clinical non-responders requiring a change in therapy.
- The multivariate analysis shows that NLR predicts the need for change in therapy, independent of the IBD phenotype and the type of biologic used.
- Further prospective trials are needed to verify these findings in both UC and CD.