NEUTROPHIL-LYMPHOCITE RATIO AS A PROGNOSTIC MARKER OF IMMUNOTHERAPY OUTCOME IN ADVANCED NON-SMALL CELL LUNG CANCER (NSCLC)

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Introduction and objectives

It has been hypothesized that an elevated neutrophil-to-lymphocyte ratio (NLR) plays a prognostic role in patients undergoing immunotherapy (IT) treatment, leading to lower response and survival rates *(1, 2)*.
We aim to conduct a retrospective study to analyse NLR in patients with advanced NSCLC who received IT in a Spanish third-level hospital. We aim to determine whether there is a correlation between NLR, Disease Control Rate (DCR) and Duration of Response (DOR). We will stratify the results based on predictive/prognostic parameters as PD-L1, histology subtype, and age (70 years old cut-off). Specific analysis will be performed according to type of treatment, either IT alone or chemo-immunotherapy (CT-IT).

Methods

The cohort included 90 patients who received IT for advanced NSCLC from January 2020 to January 2023. Patients in the group of IT in monotherapy received pembrolizumab. Patients in the CT-IT group received one of these regimens: Keynote-189 (KN189), Keynote-407 (KN407) or ABCP (*figures 1 and 2*).

We retrospectively collected data from the Electronic Health Record. Blood cell counts used to measure NRL were performed within a month prior to the start of treatment. We used a cut-off point of 5 for NLR as it is the most accepted one in the literature (2).

We divided the DCR variable in two groups, one including patients who had response or stable disease and the other one including patients who had progression disease (PD). DOR was considered from the start of the treatment until PD. We used the IBPM SPSS®22 to analyse the data. Categorical variables were compared used a chi-squared analysis. Mann-Whitney U was used test to compare continuous and categorical variables.

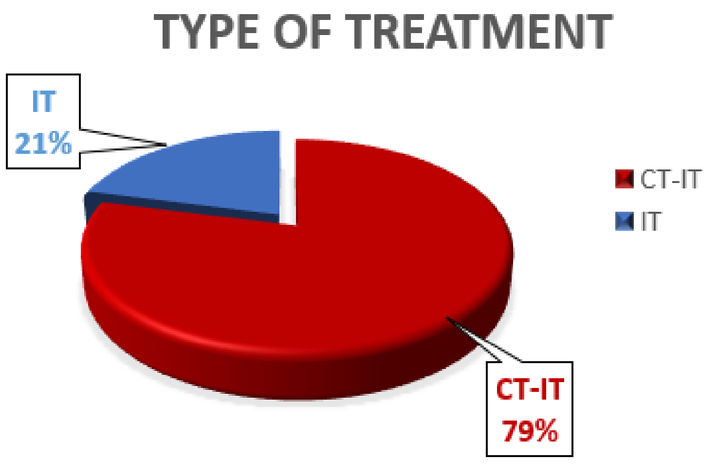

Figure 1. Type of treatment received. IT / CT-IT.

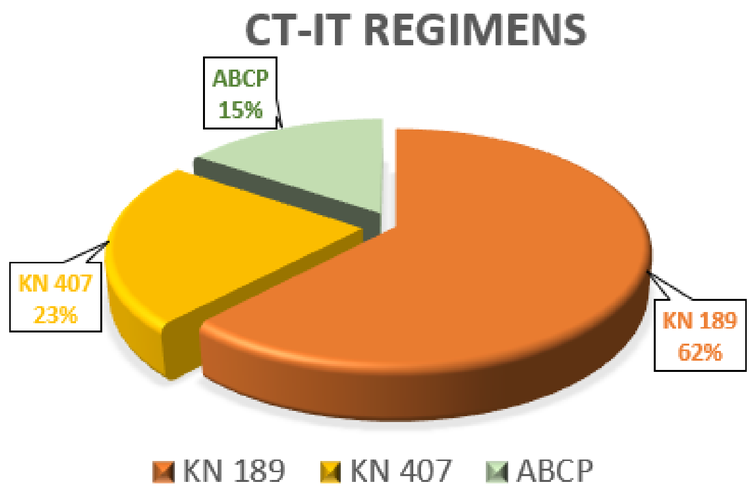

Figure 2. Chemotherapy regimens in the CT-IT group.

Results

Median age was 64.5 years old. 93% were smokers. PS1 74.4%. Adenocarcinoma 67.8%. NGS in 75.6%. Stage IV at diagnosis 75.6%. 71 patients received a CT-IT scheme (44 keynote-189, 16 keynote-407, 11 ABCP) and 19 received monotherapy with pembrolizumab. The median NLR was 3.7. Median NLR for controlled disease was 3.7 and 4.3 for progressive disease.

Results of the association between NLR, DCR and DOR in the global population and the CT-IT or IT group are shown in *table 1*. Subgroup analysis results according to age, PD-L1 and histological subtypes are shown in *table 2*.

NLR and DCR						
			NLR ≤ 5	**NLR > 5**		
Study population	DCR	Response or stable disease	91,90%	89,30%	Chi-squared	0,17
		Progressive disease	8,10%	10,70%	P value	0,69
CT-IT population	DCR	Response or stable disease	94%	90,50%	Chi-squared	0,28
		Progressive disease	6%	9.5%	P value	0,59
IT population	DCR	Response or stable disease	83,30%	85,70%	Chi-squared	0,02
		Progressive disease	16,70%	14.3%	P value	0,89
NLR and DOR			**Median DOR**			
Study population		NLR ≤ 5	11		Mann-Whitney	855
		NLR > 5	9		P value	0,91
CT-IT population		NLR ≤ 5	50		Mann-Whitney	509
		NLR > 5	21		P value	0,85
IT population		NLR ≤ 5	14		Mann-Whitney	35,5
		NLR > 5	9		P value	0,58

Table 1. NLR and DCR/DOR.

NLR and DCR						
			NLR ≤ 5	**NLR > 5**		**P value**
Age ≥70	DCR	Response or stable disease	94,40%	67,70%		0,055
		Progressive disease	5,60%	33,30%		
Age <70	DCR	Response or stable disease	90%	100,00%		0,174
		Progressive disease	1.1%	0%		
PD-L1 < 1%	DCR	Response or stable disease	94,30%	75,00%		0,09
		Progressive disease	5,70%	25%		
PD_L1 ≥1%	DCR	Response or stable disease	88%	95%		0,412
		Progressive disease	12%	5%		

Table 2. NLR and DCR according to age and PD-L1 status.

Conclusions

No association was found between NLR and DCR and DOR in our study population. In the subgroup analysis, a trend towards statistical significance is observed in ≥70 years old and PD-L1 negative subgroups.

References

1. Diem S. et al. NLR and Platelet-to-Lymphocyte ratio as prognostic markers in patients with NSCLC treated with nivolumab. Lung Cancer 2017;111:176–81.
2. Platini H, Ferdinand E, et al. NLR and PLR ratio as prognostic markers for advanced NSCLC treated with IT: A systematic review and meta-analysis. Medicina;58(8):1069.