Neutrophil-platelet score (NPS), a predictive systemic inflammation score for PD-1 immune checkpoint inhibitors (ICI) in pretreated advanced non-small cell lung cancer (NSCLC) patients


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Background: Systemic inflammation response can be characterized by changes of peripheral blood cell amounts. Several blood cell-based scores have been found to have prognostic value in some tumors treated with ICI. Neutrophil-platelet score (NPS) is a systemic inflammation-based score characterizing 3 prognostic groups: good (0), neutrophils < 7500 and platelets < 400000; intermediate (1), neutrophils > 7500 or platelets > 400000; poor (2), neutrophils > 7500 and platelets > 400000. It has never been evaluated as prognostic biomarker in NSCLC patients treated with ICI.

Methods: This is a multicenter retrospective study with the aim to evaluate prognostic value of NPS in patients with pretreated advanced NSCLC treated with PD-1 ICI between March 2015 and April 2018. Clinical data were contributed by 7 medical centers in Spain. Primary endpoint was association of NPS with overall survival (OS).

Results: 168 patients were included. Median age 65 years (39-85). 134(79,8%) were male and 121(72%) were PS 0. Predominant histologies were adenocarcinoma (50%), squamous-cell carcinoma (42,9%), 92,3% received nivolumab and 7,7% pembrolizumab. 2,3% had EGFR mutations, and 0,6% ALK rearrangement. PD-L1 IHC was available in 25% (< 1%, 36,6%; 1-49%, 39%; > = 50%, 24,4%). Median number of prior lines was 1 (1-5). Median number of cycles 11 (1-68). Median follow-up time 6,3m. Response rate (RR) was 30,4% and disease control rate (DCR) 52%. Median PFS and OS were 5,6 months (3,9-7,3) and 11,4 m (9,4-13,5). According to NPS, median OS for good, intermediate, and poor prognostic groups was 11,9m (9,4-14,4), 6,4m (3,3-10,2), and 3m (1,4-4,6), respectively (p = 0,003). Higher NPS was associated with poor OS: NPS1 HR 1,73 (95%CI 1,13-2,65), p = 0,01; NPS2 HR 2,89 (95%CI 1,31-6,39), p = 0,009. No significant association between NPS and PFS was found. NPS was associated with DCR, NPS2 had more patients with progression disease as best response to ICI than NPS1 and 0 (86 vs 57 and 42%, p = 0,039).

Conclusions: NPS predicted OS and DCR in pretreated advanced NSCLC patients who received treatment with PD-1 ICI nivolumab or pembrolizumab. These results need to be validated in prospective studies.

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