Dynamics of neutrophil to lymphocyte ratio (NLR) predict effectiveness of PD1/PDL1 inhibition

Michele Moschetta1,2, Benjamin Kasenda2, Gabriel Mak1, Mark Voskoboynik1, Nataliya Martynyuk1, Saeed Rafii1,3, Tobias H. Arkenau1,3

1 Drug Development Unit, Sarah Cannon Research Institute UK, London, United Kingdom; 2 Department for Haematology/Oncology, Klinikum Stuttgart, Stuttgart, Germany; 3 University College London, London, United Kingdom

RESULTS

Of 67 patients treated, 12 were excluded because not receiving 2 full doses of anti-PD1/PDL1 treatment. In total 55 patients were eligible (median age of 61 years, PS 0/1 = 65.5% / 34.5%, female = 34.5%). Tumor types were non-small cell lung cancers (n=18, 32.7%), renal cell (n=8, 14.5%), upper gastrointestinal (n=10, 18.2%), breast (n=7, 12.7%), urothelial (n=8, 14.5%), colorectal (n=2, 3.6%), ovarian (n=1, 1.8%), and small bowel cancers (n=1, 1.8%). Before anti-PD1/PDL1 treatment, patients received a median of 1 treatment line (range 1-6), and presented with a median number of 2 metastatic sites (range 1-4). 24 (43.6%) patients had a NLR of 1 or higher. 26 (47.3%) patients received an anti-PDL1 and 29 (52.7%) an anti-PD1 monoclonal antibody. Patients with increasing NLR between baseline and after receiving 2 doses of an anti-PD1/PD-L1 had a significantly shorter PFS in univariate analysis (HR 1.63, 95% CI 1.27 – 2.11, p = 0.001) and this effect was still observed when adjusting for baseline RPMPS in multivariable analysis (HR 1.63, 95% CI 1.23 – 2.15, p = 0.001). Lymphocyte absolute count (LAC) did not change significantly after treatment in both patient who benefit and not, but while Neutrophil absolute count (NAC) significantly decreased after treatment with anti-PD1/PD-L1 agent in patient that responded to treatment, where as the Lymphocyte absolute count (LAC) did not.

CONCLUSIONS

Changes in the NLR (as continuous variable) after 2 cycles of treatment with anti-PD1/PDL1 treatment independently predict PFS in patients with multiple types of advanced cancer. Decrease in NAC but not in LAC after an anti-PD1/PD-L1 agent also predicts response to treatment.

INTRODUCTION

Baseline neutrophil/lymphocyte ratio (NLR) has repeatedly been associated with progression free (PFS) and overall survival (OS) of patients with advanced cancer. We explored whether changes in NLR can predict PFS of advanced cancer patients enrolled into Phase-1 trials and treated with anti-PD1/PDL1 checkpoint inhibitors.

METHODS

Stage IV cancer patients enrolled into Phase-1 trials between September 2013 and May 2016, and treated with an anti-PD1/PDL1 checkpoint inhibitors were included in the study. NLR was calculated before starting treatment, and after administration of 2 doses of treatment. Royal Marsden Prognostic Score (RMPS) was calculated at baseline for all patients enrolled. Kaplan-Meier estimation and Cox regression analyses with a random effect for tumor entity (to account for heterogeneity between tumor types) were used to assess the impact of NLR changes on PFS. Patients who were not able to receive at least 2 doses of treatment were excluded to avoid guarantee time bias.

RESULTS

Patients’ characteristics (%) patients [tumor type] N (%)
Tumor line Age (mean) Hb score
M 15 (24.1) 31 (54.6) 1 19 (34.5) 1 19 (34.5)
P 28 (43.6) 3 (5.5) 0 34 (61.8) 0 34 (61.8)

Patients’ characteristics (%) patients [tumor type]

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