Predictor Value of PD-L1 for Radiotherapy Response in Locally Advanced Non-small Cell Lung Cancer

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Objective

The discovery of PD-L1 receptors triggered a great interest in immunotherapeutics for the management of locally advanced non-small-cell lung carcinoma (NSCLC). The efficacy of immunotherapeutics for overall survival (OS) in locally advanced NSCLC has been proven in several clinical trials. However, no data exist for the relationship between radiotherapy (RT) response and programmed death-ligand (PD-L1) receptor positivity in the literature. In this regard, we aimed to investigate the predictor value of PD-L1 receptors for RT response.

Methods

Eighty patients who were diagnosed as having locally advanced NSCLC were selected from among patients in whom PD-L1 status was assessed in the Gazi University pathology laboratory. The relationship between PD-L1 and progression-free survival (PFS), OS, metastasis-free survival (MFS), RT response, RT doses were evaluated using Kaplan-Meier and Cox regression analysis. Chi-square and t-tests were used for descriptive statistics.

Results

The median follow-up was 16.1 months. The mean age was 61.1 years. PD-L1 positivity was detected in 34 patients. One year and 2-year OS and PFS ratios were found as 87%, 54%, and 65%, 30%, respectively. The median OS and PFS were 26.8 and 15.1 months, respectively. There was no statistically significant difference between PD-L1 receptor status and OS and PFS (p=0.736 and p=0.372, respectively). In the PD-L1 positive subgroup analysis for OS, doses higher than 60 Gy (n=28, mean dose 64.6±1.53) were found superior to the 60 Gy dose (n=6) (p=0.034). The median MFS was 33 months.

Conclusion

PD-L1 status did not seem to be predictive for RT response. However, despite the low number of patients in the 60 Gy group, our study showed that dose escalation could improve survival in PD-L1 positive locally advanced NSCLC. There is a disparity between the RTOG 0617 study, which reported that dose-escalation did not affect OS, and our results. We are aware that our data are not strong enough to claim such a result. However, this finding may draw attention to dose escalation studies, and in the era of tailored therapy, this knowledge may provide valuable for selecting the correct RT dose for patients.

All of the authors guarantee there is no conflict of interest for this study.

Variables	Patient number and ratio (n=80, %)
Gender	
Female	4 (5%)
Male	76 (95%)
Age	Mean 61.1
<65	59 (74%)
>65	21 (26%)
Smoking	
Yes	71 (89%)
No	9 (11%)
Comorbidity	
Yes	36 (45%)
No	44 (55%)
Histology	
SCC	53 (66%)
Adenocarcinoma	24 (30%)
Other	3 (4%)
Tumor size	Mean 6
<5 cm	19 (24%)
5-7 cm	23 (29%)
>7 cm	38 (47%)
T stage	
T1	8 (10%)
T2	13 (16%)
T3	21 (26%)
T4	38 (48%)
N stage	
N0	8 (10%)
N1	6 (8%)
N2	51 (64%)
N3	15 (18%)
Clinical stage	
3A	28 (35%)
3B	40 (50%)
3C	12 (15%)
PD-L1	
Positive	34 (43%)
Negative	46 (57%)
PD-L1 percentage	n=34
<1%	3 (9%)
1-50%	18 (53%)
>50%	13 (38%)
Molecular profile	
EGFR +	3 (4%)
ROS +	1 (1%)
ALK +	1 (1%)
Definitive therapy	
CRT	78 (98%)
RT	2 (2%)
RT technique	
3D-CRT	68 (85%)
IGRT	12 (15%)
RT dose	Mean 63.8 Gy
60 Gy	12 (15%)
>60 Gy	68 (85%)
RT field	
Primary+mediastinum	72 (90%)
Primary only	8 (10%)
Chemotherapy regimen	n=78
Cisplatin+paclitaxel	7 (9%)
Carboplatin+paclitaxel	61 (78%)
Cisplatin+etoposide	4 (5%)
Other	6 (8%)
Timing	n=78
Concurrent CRT	56 (73%)
Sequential CRT	22 (27%)
Treatment response	
Complete	6 (8%)
Partial	62 (78%)
Stable	10 (13%)
Progressive	2 (1%)
Local recurrence	
Yes	38 (48%)
No	42 (52%)
Distant metastasis	
Yes	22 (28%)
No	58 (72%)
Metastasis site	n=22
Bone	8 (36%)
Brain	7 (32%)
Lymph node	3 (14%)
Other	4 (18%)
Second-line therapies	
Second-line chemotherapy	41
Palliative RT	15