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Predictive factor for treatment response of osimertinib in NSCLC patients with T790M mutation

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Background/Aims: Osimertinib is a third-generation epidermal growth factor receptor-tyrosine kinase inhibitor (EGFR-TKI), and is currently used for non-small cell lung cancer (NSCLC) patients who identified T790M mutations after using first- or second-generation EGFR-TKI in Korea. There has been little research on clinicopathologic factors predicting response to osimertinib therapy. In this study, we analyzed various clinical factors that could affect the efficacy of osimertinib to identify significant predictive factor. **Methods:** We retrospectively analyzed 35 patients with acquired T790M mutation who received osimertinib treatment from January 2013 to May 2019 in Chungnam National University Hospital. The treatment response to osimertinib was classified as PR-PR, PR-SD, SD-SD, and PD or SD-PD according to the first response at 3 months and the second response at 6 months after treatment. Patients who did not undergo second response assessment were excluded from the analysis. **Results:** A total of 31 patients were included in the final analysis, with an average age of 65 years. Of the total patients, 15 were males and 16 were females. The mean treatment duration of the 1st-line EGFR-TKI was 17 months. Two patients (6.5%) showed PR-PR response to osimertinib, 14 patients (45.2%) had PR-SD response, 12 patients (38.7%) had SD-SD, and 3 patients (9.7%) had PD or SD-PD. There was no statistically significant difference in treatment response to osimertinib according to age, sex, smoking history, EGFR mutation type, response to 1st-line EGFR-TKI, and re-biopsy location. The treatment duration of 1st-line EGFR-TKI was found to be statistically significant predictor of osimertinib treatment response. Patients who received the 1st-line EGFR-TKI treatment for less than 10 months had a statistically significant better response to osimertinib than patients who received treatment for more than 10 months. **Conclusions:** This retrospective study showed that the efficacy of osimertinib was better in patients with a shorter duration of first-line EGFR-TKI treatment in NSCLC patients.

		1st EGFR-TKI <10 months	EGFR-TKI ≥ 10 months	p value
		N = 5, n (%)	N = 26, n (%)	
Age	Median(range)	67.4	62.96	0.703
Sex	Male	3 (60)	12 (46.2)	0.654
	Female	2 (40)	14 (53.8)	
Smoking Hx	Never-smokers	2 (40)	20 (76.9)	0.131
	Current/former smokers	3 (60)	6 (23.1)	
EGFR mutation	Wild type	1 (20)	2 (7.7)	0.180
	Exon 19 deletion	4 (80)	13 (50)	
	Exon 21 L858R	0 (0)	11 (42.3)	
EGFR-TKIs	Gefitinib	4 (80)	18 (69.2)	0.99
	Afatinib	1 (20)	8 (30.8)	
Re-biopsy site	Lung	3 (60)	10 (38.5)	0.194
	Bone, Liver	2 (40)	3 (11.5)	
	Pleural fluid	0 (0)	6 (23.1)	
	Blood	0 (0)	7 (26.9)	
Osimertinib responses**	PR-PR	2 (40%)	0 (0%)	0.009
	PR-SD	3 (100%)	11 (42.3%)	
	SD-SD	0 (0%)	12 (46.2%)	
	PD or SD-PD	0 (0%)	3 (11.5%)	

Table1. Baseline characteristics and osimertinib response according to 1st EGFR-TKI treatment duration