EPH238

The Health Impact of Pembrolizumab in Combination with Chemotherapy for the First-Line Treatment of Patients with Non-Squamous Metastatic Non-Small Cell Lung Cancer (mNSCLC) in Türkiye

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Background

- Lung cancer (LC) is the leading cause of cancer-related mortality worldwide, accounting for nearly 20% of all cancer deaths.[1]
- LC is divided into two primary types: small cell and non-small cell lung cancer, the latter accounting for 80–85% of all lung cancers globally.[2]
- In Türkiye in 2022, LC represented the most frequently diagnosed and deadliest cancer, with 41,032 newly diagnosed cases and 38,505 attributable deaths.[3] Among these, 10,883 cases were identified as non-squamous, metastatic non–small cell lung cancer (mNSCLC).[4]

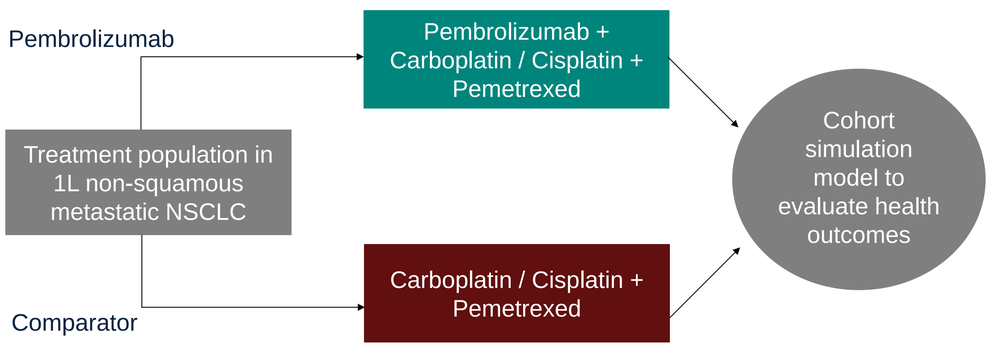
Aims

- To quantify and evaluate the impact of pembrolizumab in combination with chemotherapy on health in metastatic, non-squamous, non-small cell lung cancer (NSCLC) patients.

Methods

- A partitioned survival model was used and adapted to the Turkish payer perspective to assess the potential health outcomes associated with pembrolizumab in combination with chemotherapy (platinum and pemetrexed) versus chemotherapy alone. Outcomes include: life years (LYs), quality-adjusted life years (QALYs).
- Data on clinical effectiveness, treatment utilization, health utilities (based on EuroQoL-five dimensions questionnaire (EQ-5D-3L) utility data), and safety were derived from the KEYNOTE-189 trial (data cut-off date of March 8, 2022) and projected over a 20-year horizon.
- For estimating overall survival (OS), KEYNOTE-189 Kaplan Meier (KM) data for both trial arms were utilized for model weeks 1-260 (Years 1-5) and U.S. Surveillance Epidemiology and End Results (SEER)-based annual mortality risks for non-squamous mNSCLC patients thereafter. The same adjusted SEER-based mortality risks were applied to both the chemotherapy and pembrolizumab + chemotherapy arms.
- A risk adjustment factor is used to account for differences in observed mortality between the trial and SEER populations (base case analysis).
- A 3% annual discount rate was applied to health outcomes.
- Scenario, deterministic (DSA) and probabilistic sensitivity analyses (PSA) were conducted to test the robustness of the model results.

Figure 1. Model structure



Key: 1L, first-line; NSCLC, non-small cell lung cancer.

Figure 2. Transition diagram for cohort simulation model health outcomes

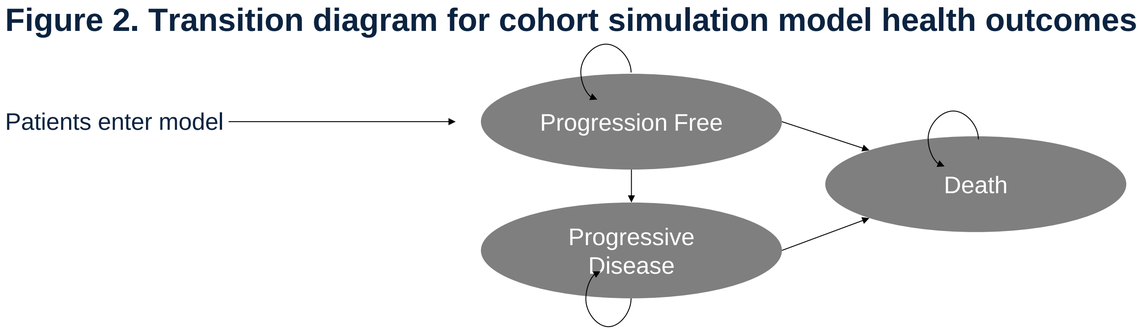


Table 1. General base-case setting and model assumptions

	Category	Input
	Perspective	Turkish Payer Perspective
	Time horizon	20 years
	Discounting	3% for health outcomes
	Population	• Target population defined by KEYNOTE-189 eligibility. • Adults ≥18 years (average age of 63 years) with non-squamous, metastatic (stage IV) NSCLC tumor(s) without sensitizing mutations of EGFR or ALK translocations, eligible for 1L systemic chemotherapy. • Model adapted to the Turkish NSCLC population meeting these criteria.
	Treatment duration	• Prior to any stopping rules, treatment with pembrolizumab or chemotherapy is expected to be continued until disease progression, unacceptable adverse events or patient/physician decision to interrupt treatment. • If none of these occur, stopping rules per the KEYNOTE-189 protocol apply: – Pembrolizumab: 35 cycles (2 years of continuous treatment) – Platinum + pemetrexed: for a maximum of 4 cycles (12 weeks of continuous treatment) – Pemetrexed maintenance therapy in both trial arms has no stopping rule and can continue until documented disease progression, unacceptable adverse experiences or physician decision to discontinue.

Key: NSCLC, Non-small cell lung cancer; EGFR, Epidermal Growth Factor Receptor; ALK, Anaplastic Lymphoma Kinase; 1L, first-line.

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Table 2: Key inputs of the base-case model

Parameter	Base-case Input
OS – pembrolizumab + chemotherapy	KM data through week 260, followed by SEER mortality risks
OS – chemotherapy	KM data through week 260, followed by SEER mortality risks
PFS – pembrolizumab + chemotherapy	KM80+ lognormal following
PFS – chemotherapy	KM80+ Exponential following
ToT – pembrolizumab + chemotherapy	Gompertz model
ToT – chemotherapy	Generalized gamma model
Utilities – By Time to Death (Pooled)	0.838 (≥360 days)
	0.782 (180-359 days)
	0.713 (30-179 days)
	0.550 (<30 days)

Key: OS, overall survival; PFS, Progression-free survival; ToT, Time on treatment; KM, Kaplan Meier; SEER,Surveillance Epidemiology and End Results.

Results

- Total LYs were estimated to be 3.31 and 1.52 for the pembrolizumab + chemotherapy and chemotherapy arms, respectively.
- Total QALYs were estimated to be 2.69 for pembrolizumab + chemotherapy vs 1.20 for chemotherapy.
- The addition of pembrolizumab to chemotherapy was estimated to add 1.79 LYs and the increment in QALYs was 1.49 (**Table 3**).
- Scenario analyses varying the model time horizon (15, 25 and 30 years) demonstrated that extending follow-up to 20, 25 and 30 years progressively increased QALYs and further improved the outcomes of pembrolizumab plus chemotherapy (**Table 4**).
- Results from the DSA, PSA and scenario analyses support the base-case findings.
- The parameter that had the most impact was the pooled health utility value for patients with ≥ 360 days from death.

Table 3. Total impact on health outcomes of treatment of pembrolizumab + chemotherapy vs. chemotherapy in full trial population

	Chemotherapy	Pembrolizumab + Chemotherapy	Incremental Pembrolizumab + Chemotherapy vs. Chemotherapy
Life years	1.52	3.31	1.79
Time in progression free state (months)	7.62	19.24	11.62
Time in progressive state (months)	10.66	20.45	9.79
QALYs	1.20	2.69	1.49

Table 4: Impact of time horizon

Time Horizon	Incremental QALYs
15 years	1.38
20 years (base case)	1.49
25 years	1.56
30 years	1.60

Conclusions

- The results indicate that pembrolizumab in combination with chemotherapy for the first-line treatment of patients with non-squamous mNSCLC in Türkiye yields substantive incremental QALYs and LYs versus chemotherapy. Therefore, pembrolizumab in combination with chemotherapy is expected to generate considerable benefits for patients, the healthcare system, payers, and public health.

References

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