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Economic evaluation of cemiplimab plus chemotherapy treatment in advanced non-small cell lung cancer (NSCLC) with at least 50% programmed cell death receptor ligand-1 (PD-L1) positivity for the United States

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Background

- The EMPOWER-Lung 3 trial showed that cemiplimab plus chemotherapy significantly prolonged the duration of progression-free survival and overall survival in advanced non-small cell lung cancer (NSCLC) patients with at least 50% programmed cell death receptor ligand-1 (PD-L1) positivity, yet the financial burden may limit its use[1].
- The American Cancer Society's estimation for lung cancer deaths in the US for 2024 was about 125,070 (65,790 in men and 59,280 in women) of. 80-85 % of instances of lung cancer are non-small-cell lung cancer, most of which are detected at a stage where the disease is metastatic or locally progressed and have a dismal prognosis[2].
- When patients with advanced non-small-cell lung cancer had PD-L1 tumor expression of at least 50% and no detectable biomarkers at a 1-year follow-up, cemiplimab significantly improved their chances of survival[2].

Objective

To evaluate the cost-effectiveness of cemiplimab plus chemotherapy versus cemiplimab alone in a US setting.

Methods

- A partitioned survival model was developed to capture time spent by patients in three health states: progression-free, progression, and death. Clinical outcomes from the EMPOWER-Lung 1 and 3 trial studies were obtained.
- In the absence of head-to-head studies, indirect treatment comparisons were conducted to capture the comparative effectiveness between cemiplimab plus chemotherapy and cemiplimab alone. No population adjustments were needed.
- A 20-year time horizon was adopted, and a 3% discount rate was applied to costs and utilities after year 1. Wholesale acquisition costs for treatments were sourced from Redbook, adverse event costs (grade 3/4; all grades for immunotherapy-related AEs) utilized published data, and monitoring costs were based on Physician Fee Schedules (US $2023) [3,4,5].
- Exponential regression was utilized to extrapolate the cemiplimab plus chemotherapy OS Kaplan-Meier curve, while Weibull regression was applied for extrapolation of the cemiplimab alone OS curve.

Results

- For a 20-year time horizon, Base Case analysis (Probabilistic Sensitivity Analysis) showed an incremental cost of cemiplimab plus chemotherapy over cemiplimab alone of $29,881 ($30,170), an incremental LY of 0.07 (0.07), and an incremental QALY of 0.05 (0.05), yielding an ICER of $426,872 ($430,996) per LY gained and an ICUR of an incremental cost of $597,621 ($603,395) per QALYg.

Table 2. Base Case Analyses and Probabilistic Sensitivity Analyses for Incremental Cost-Effectiveness Ratio and Incremental Cost-Utility Ratio Comparing Cemiplimab plus Chemotherapy to Cemiplimab alone

	Base case analyses		Probabilistic sensitivity analyses	
	Cemiplimab plus Chemotherapy	Cemiplimab	Cemiplimab plus chemotherapy	Cemiplimab
Cost	$194,606.53	$164,725.49	$194,895.23	$164,725.49
LYg	0.90	0.83	0.90	0.83
QALYg	0.64	0.59	0.64	0.59
ICER/LYg	$426,872		$430,996	
ICUR/QALYg	$597,621		$603,395	

Conclusion

Compared to cemiplimab alone, cemiplimab plus chemotherapy was not cost effective for NSCLC patients with at least 50% (PD-L1) at the cost-effectiveness threshold of $150,000 per QALY in the United States.

References

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