EE387

Economic Evaluation of Tarlatamab as Second-Line Therapy for Metastatic Small Cell Lung Cancer: A United States Perspective

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Introduction

Tarlatamab significantly prolonged overall survival compared with chemotherapy for small cell lung cancer (ES-SCLC) patients progressing during or after platinum-based chemotherapy. This study aimed to evaluate the cost-effectiveness of tarlatamab compared to chemotherapy as a second-line treatment for ES-SCLC from the perspective of the United States healthcare system.

Methods

A partitioned survival model was constructed to simulate disease progression, based on the DeLLphi-304 trial study. The model adopted a 28-day cycle length and a 10-year time horizon. Individual patient-level data were reconstructed and extrapolated using R software to support survival analysis. Direct medical costs, including expenditures associated with medications, laboratory testing, follow-up treatments, best supportive care, management of adverse events, end-of-life care, and other healthcare-related services were considered. Drug prices were obtained from sourced from the Drug Price Guide, while health utility estimates were extracted from previously published studies. The incremental cost-effectiveness ratio (ICER) served as the primary economic outcome, with model outputs also including total and incremental costs, as well as quality-adjusted life years (QALYs) and incremental QALYs. A willingness-to-pay (WTP) threshold was set at $150,000.00/QALY for the United States One-way sensitivity analysis and probabilistic sensitivity analyses were conducted to evaluate the robustness of the model outcomes.

Table 1 Clinical Data

Survival model for tarlatamab		Survival model for chemotherapy	
Exponential model for OS	Rate=0.0487	Loglogistic model for OS	Shape=1.507
Lognormal model for PFS	Meanlog=1.414		Scale=8.653
	Sdlog=1.113	Lognormal model for PFS	Meanlog=1.202

Table 2 Cost Data

Drug cost per mg				Cost of severe AEs, $			
Parameter	Value	Range		Parameter	Value	Range	
		Minimum	Maximum			Minimum	Maximum
Tarlatamab	1,611.28	1,289.02	1,933.54	**Hyponatremia**	0.29	0.23	0.35
Topotecan (injection)	747.79	598.23	897.35	**Pneumonia**	28,440.28	22752.22	34,128.34
Topotecan (oral)	5,19.275	415.42	623.13	**Fatigue**	10,229.69	8,183.75	12,275.63
Lurbinectedin	8,667.59	6,934.07	10,401.11	**Neutrophil count decrease**	15,614	12,491.20	18,736.80
Nivolumab	139.55	111.64	167.46	**Platelet count decrease**	14,984	11,987.20	17,980.80
Pembrolizumab	252.24	201.79	302.69	**Febrile neutropenia**	29,315	23,452.00	35,178.00
Best support care per cycle	2,207.21	1,765.77	2,648.65	**Thrombocytopenia**	14,984	11,987.20	17,980.80
Follow-up per cycle	367.41	293.93	440.89	**Leukopenia**	14,984	11,987.20	17,980.80
End-of-life, one time	32,934.53	26,347.62	39,521.44	**Neutropenia**	15,614	12,491.20	18,736.80
				Anemia	9,079.75	7,263.80	10,895.70

***Note**: In the poster, the model parameters were adjusted, which slightly deviated from the abstract but did not affect the results.*

Table 3 Incidence of AEs

Tarlatamab group				Chemotherapy group			
Parameter	Value	Range		Parameter	Value	Range	
		Minimum	Maximum			Minimum	Maximum
Hyponatremia	5%	4.00%	6.00%	**Hyponatremia**	5%	4.00%	6.00%
Pneumonia	6%	4.80%	7.20%	**Pneumonia**	8%	6.40%	9.60%
Neutropenia	6%	4.80%	7.20%	**Fatigue**	7%	5.60%	8.40%
				Neutrophil count decrease	11%	8.80%	13.20%
				Platelet count decrease	8%	6.40%	9.60%
				Febrile neutropenia	11%	8.80%	13.20%
				Thrombocytopenia	11%	8.80%	13.20%
				Leukopenia	14%	11.20%	16.80%
				Neutropenia	23%	18.40%	27.60%
				Anemia	29%	23.20%	34.80%

Table 4 Utility

Utility			
Parameter	Value	Minimum	Maximum
PFS	0.7	0.56	0.84
PD	0.6	0.48	0.72
Disutility			
Parameter	Value	Parameter	Value
Hyponatremia	-0.09	**Febrile neutropenia**	-0.2
Pneumonia	-0.07	**Thrombocytopenia**	-0.2
Fatigue	-0.07	**Leukopenia**	-0.2
Neutrophil count decrease	-0.2	**Neutropenia**	-0.09
Platelet count decrease	-0.05	**Anemia**	-0.07

Results

Treatment with tarlatamab yielded an additional 0.29 QALYs compared to chemotherapy, at an incremental cost of $192,962.93 This resulted in an ICER of $665,389.41 per QALY, which substantially exceeds the WTP threshold. The cost of tarlatamab emerged as a major influential parameter in the sensitivity analyses, demonstrating a substantial impact on the cost-effectiveness outcomes.

Table 5 Baseline Analysis of CEA

	Cost ($)	Effectiveness (QALYs)	ICER ($/QALY)
Tarlatamab	361542.49	1.08	665389.41
Chemotherapy	168579.56	0.79	

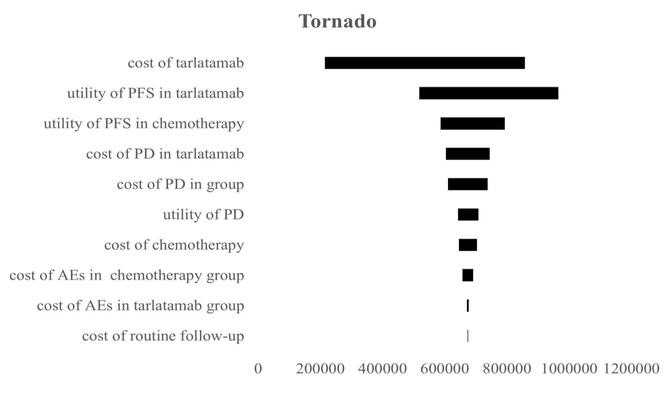

Figure 1 The Tornado diagram

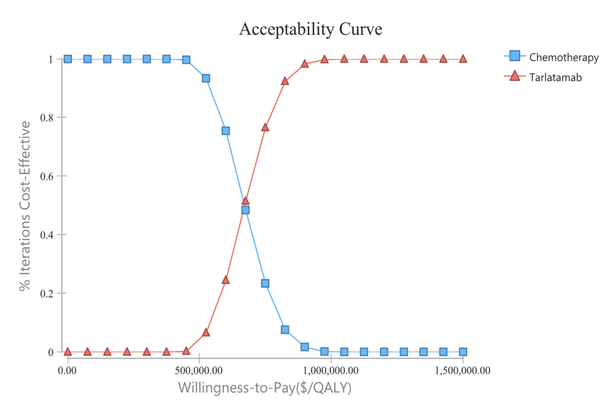

Figure 2 The cost-effectiveness acceptability curve

Conclusion

At a WTP threshold of $150,000/QALY, tarlatamab was not considered a cost-effective option compared to chemotherapy for the treatment of recurrent ESCLC from the U.S. payer perspective.