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CHAPMAN UNIVERSITY
SCHOOL OF PHARMACY

Cost-effectiveness Analysis of Axicabtagene Ciloleucel, Lisocabtagene Maraleucel, and Tisagenlecleucel CAR T-Cell Therapies for Treatment of Relapsed or Refractory Large B-cell Lymphoma (LBCL)

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Background

Axicabtagene ciloleucel (axi-cel), lisocabtagene maraleucel (liso-cel), and tisagenlecleucel (tisa-cel) are chimeric antigen receptor (CAR) T-cell therapies used to treat adult patients with large B-cell lymphoma (LBCL) who relapsed within 12 months of first line therapy. However, no head-to-head clinical trials have been conducted to compare them.

Objective

This study estimated the cost-effectiveness of axi-cel versus liso-cel versus tisa-cel in patients with relapsed/refractory LBCL (rrLBCL) from a US healthcare payer perspective.

Methods

We conducted a cost-effectiveness analysis of axi-cel, liso-cel, and tisa-cel for treatment of patients with relapsed or refractory large B-cell Lymphoma.

Gained outcomes and adverse events were derived from the pivotal trials (ZUMA-7, TRANSFORM, and BELINDA) and literature reviews. Costs were extracted from the IBM-Micromedex Red Book, Centers for Medicare and Medicaid Services, and existing literature. Probabilistic sensitivity analyses were performed.

The primary outcomes included quality of life (QoL) and quality-adjusted life years (QALYs).

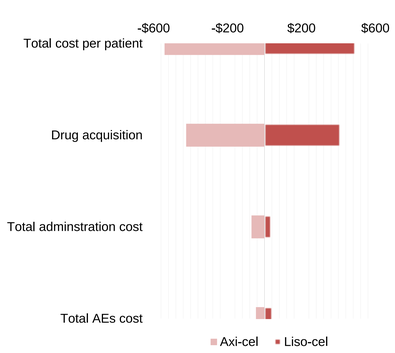
Results

Table 1. Efficacy Endpoints

	Axi-cel	Axi-cel vs. liso-cel			Axi-cel vs. tisa-cel		
Efficacy endpoints	# of patients ZUMA-7 (axi-cel)	# of patients TRANSFORM (liso-cel)	Time (months)	p-value*	# of patients BELINDA (tisa-cel)	Time (months)	p-value*
Primary efficacy endpoint							
Event-free survival	180	92	18	0.72	162	18	< .00001
Secondary efficacy endpoints							
Overall survival	180	92	19	0.38	162	19	0.01
Progression-free survival	180	92	18	0.60			
	% of patients ZUMA-7 (axi-cel)	% of patients TRANSFORM (liso-cel)	ROR (95% CI)	p-value**	% of patients BELINDA (tisa-cel)	ROR (95% CI)	p-value**
Overall response rate	83	86	0.79 (0.37-1.71)	0.56	46	2.75 (1.42-5.33)	0.00
Complete response	65	66	0.96 (0.53-1.71)	0.88	28	4.78 (2.62-8.70)	0.00
Partial response	18	20	0.88 (0.43-1.78)	0.72	18	1.00 (0.49-2.06)	1.00
Stable disease	3	4	0.74 (0.16-3.41)	0.70	12	0.23 (0.06-0.83)	0.02
Progressive disease	12	7	1.81 (0.68-4.81)	0.23	31	0.30 (0.15-0.63)	0.00
· **Unknown**	2	3	0.66 (0.11-4.04)	0.65	11	0.17 (0.04-0.77)	0.01

* p-value was calculated using the Kaplan–Meier method with log-rank test over the indicated period.
**p-value was calculated using the RORs, where axi-cel is the reference.

Figure 1. Cost Components



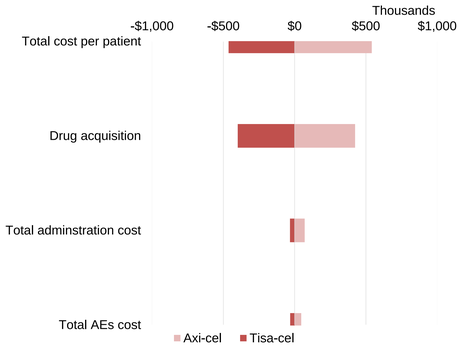


Table 2. Cost-effectiveness analyses.

	Axi-cel	Liso-cel	Tisa-cel
Life years gained	**8.01**	**8.01**	**3.16**
Health state utility value	**0.57**	**0.56**	**0.64**
QALYs	**4.57**	**4.49**	**2.02**
Total cost per patient ($)	**$541,026**	**$491,759**	**$463,368**
Incremental cost ($)	**Ref**	**$49,267**	**$77,658**
Incremental QALYs	**Ref**	**0.08**	**2.54**
ICER	**Ref**	**$615,069**	**$30,534**

- The total costs per patient were $541,026, $491,759, and $463,368, for axi-cel, liso-cel, and tisa-cel, respectively.
- Total QALYs for axi-cel exceeded liso-cel (4.57 versus 4.49) and tisa-cel (4.57 versus 2.02) with incremental costs per QALY gained of $615,069 versus liso-cel and $30,534 versus tisa-cel.
- The probability that the gene therapy is cost-effective was 99% at a willingness to pay $150,000 per QALY.

Conclusions

Axi-cel had comparable efficacy with liso-cel, and better efficacy than tisa-cel. Axi-cel was associated with more incidence of CRS and neurologic events, but less incidence of grade 3-4 AEs than liso-cel and tisa-cel. Liso-cel was more cost-effectivene than axi-cel and tisa-cel. for treatment of patients with relapsed or refractory large B-cell Lymphoma.