Budget Impact Model for Loncastuximab Tesirine-lpyl in the Treatment of Relapsed/Refractory Diffuse Large B-cell Lymphoma

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Introduction

- Diffuse large B-cell lymphoma (DLBCL) is an aggressive B-cell malignancy and the most common form of non-Hodgkin lymphoma, accounting for approximately one-quarter of all new cases.[1]
- Loncastuximab tesirine-lpyl was granted approval by the United States Food & Drug Administration for the treatment of patients with relapsed/refractory (R/R) DLBCL who have received two or more prior lines of therapy based on a multicenter, open-label, single-arm, phase II clinical trial (NCT 03589469) that showed an objective response rate of 48.3%.[2]

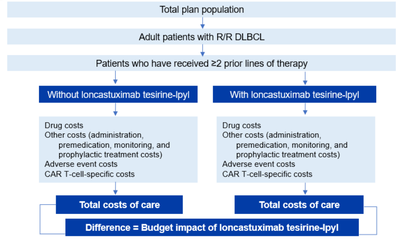
Objective

- To estimate the potential budget impact of adding loncastuximab tesirine-lpyl to a drug formulary for the treatment of adult patients with R/R DLBCL who had received ≥2 prior lines of therapy from a US commercial health plan perspective

Methods

- A budget impact model (BIM) was developed to estimate the cost difference of 2 scenarios, a drug formulary without loncastuximab tesirine-lpyl vs one with loncastuximab tesirine-lpyl.

Model structure



Key model assumptions

- All adult patients with R/R DLBCL who had received ≥2 prior lines of therapy were eligible for loncastuximab tesirine-lpyl, and the number of eligible patients was stable over 3 years.
- The introduction of loncastuximab tesirine-lpyl would replace market share[3] of existing pharmacological treatments for R/R DLBCL, mostly the targeted therapies; no impact on the market share of CAR-T therapies was assumed.
- Costs associated with grade 3 or 4 adverse events ≥5% in any treatment and hypogammaglobulinaemia of any grade (i.e., B-cell aplasia) were considered in the model.
- CAR-T specific costs included those for leukapheresis, bridging chemotherapy, lymphocyte depleting chemotherapy, and administration-related healthcare resource use (intensive care unit [ICU] costs due to cytokine release syndrome [CRS], ICU costs not due to CRS, and other inpatient or outpatient costs that were not attributable to adverse events).

Model output

- The BIM estimated the total annual costs of care over the course of treatment and costs per member per month (PMPM) over a 3-year time horizon. All costs are in 2021 USD.
- Sensitivity analyses were conducted to assess the robustness of the BIM when varying total eligible patients, loncastuximab tesirine-lpyl drug cost and treatment duration, body weight and surface area, other treatment durations, and adverse event costs.

Results

- In a hypothetical plan of 1 million members, the BIM estimated each year a total of 13 adult patients with R/R DLBCL who had received ≥2 prior lines of therapy.
- Total annual costs of care over the course of treatment of newly approved pharmacological treatments were estimated at $63,372, $171,018, $308,534, and $107,812 for selinexor, polatuzumab vedotin-piiq+bendamustine+rituximab, tafasitamab-cxix+lenalidomide, and loncastuximab tesirine-lpyl respectively.

Table 1. Total Annual Costs (2021 USD) of Care Over the Course of Treatment[a]

	Median treatment duration (months)	Total annual costs
Loncastuximab tesirine-lpyl	2.07	$107,812
Polatuzumab vedotin-piiq+bendamustine+rituximab	3.45	$171,018
Tafasitamab-cxix+lenalidomide	6.20+4.10 monotherapy	$308,534
Selinexor	2.07	$63,372
Axicabatagene ciloleucel	NA	$502,725
Tisagenlecleucel	NA	$475,296
Lisocabtagene maraleucel	NA	$492,918
Chemotherapy/chemoimmunotherapy[b]	2.40	$40,308
Other targeted therapies[c]	3.20	$64,203

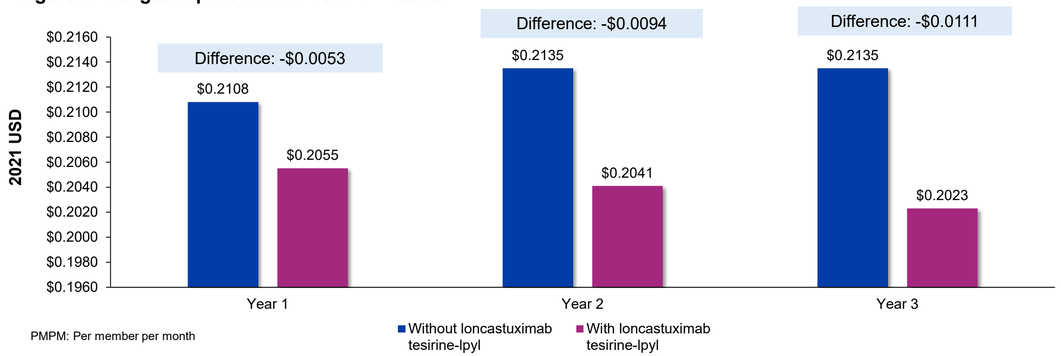
[a] Treatment course durations differed among the treatment regimens. They were determined according to the median treatment duration of approved drug indications or relevant clinical trials; [b] 85.7% gemcitabine + oxaliplatin + rituximab (GemOx + R) and 14.3% bendamustine and rituximab; [c] 16.7% rituximab + lenalidomide (R-squared), 38.9% ibrutinib-based therapy, and 44.4% lenalidomide-based therapy.

Table 2. Detailed Cost Components (2021 USD)

	Without loncastuximab tesirine-lpyl			With loncastuximab tesirine-lpyl			Budget impact		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Plan total costs by category									
Plan total costs	$2,529,561	$2,561,434	$2,561,434	$2,465,526	$2,448,931	$2,427,960	-$64,035	-$112,503	-$133,474
Drug costs	$2,170,299	$2,200,152	$2,200,152	$2,117,945	$2,108,399	$2,089,946	-$52,354	-$91,753	-$110,206
Other costs[a]	$51,573	$52,316	$52,316	$44,307	$40,264	$38,498	-$7,267	-$12,052	-$13,818
Adverse event costs	$91,494	$92,771	$92,771	$87,079	$84,073	$83,321	-$4,414	-$8,698	-$9,450
CAR-T specific costs	$216,195	$216,195	$216,195	$216,195	$216,195	$216,195	$0	$0	$0
PMPM costs by category									
PMPM costs	$0.2108	$0.2135	$0.2135	$0.2055	$0.2041	$0.2023	-$0.0053	-$0.0094	-$0.0111
Drug costs	$0.1809	$0.1833	$0.1833	$0.1765	$0.1757	$0.1742	-$0.0044	-$0.0076	-$0.0092
Other costs[a]	$0.0043	$0.0044	$0.0044	$0.0037	$0.0034	$0.0032	-$0.0006	-$0.0010	-$0.0012
Adverse event costs	$0.0076	$0.0077	$0.0077	$0.0073	$0.0070	$0.0069	-$0.0004	-$0.0007	-$0.0008
CAR-T specific costs	$0.0180	$0.0180	$0.0180	$0.0180	$0.0180	$0.0180	$0.0000	$0.0000	$0.0000

[a] Other costs included administration, premedication, monitoring, and prophylactic treatment costs. PMPM: Per member per month

Figure 1. Budget Impact-PMPM: Year 1 – Year 3



PMPM: Per member per month

- Using the base-case scenario of loncastuximab tesirine-lpyl market share increasing from 14% in year 1 to 23% in year 2 to 25% in year 3, the cost savings increased from $0.0053 PMPM in year 1 to $0.0094 PMPM in year 2 to $0.0111 PMPM in year 3; equivalent to total cost savings of $64,035, $112,503, and $133,474, respectively, in a plan of one million members.

Results cont.

- Over the 3-year time horizon, the largest cost savings were predicted in drug costs ($52,354 to $110,206) followed by other costs ($7,267 to $13,818) and adverse event costs ($4,414 to $9,450).
- In the sensitivity analyses, the results were robust with predicted cost savings in nearly all scenarios (budget impact ranged -$0.0186 to $0.0029 PMPM) and were most sensitive to loncastuximab tesirine-lpyl treatment duration and least sensitive to loncastuximab tesirine-lpyl adverse event costs.

Limitations

- The proportions of patients with R/R DLBCL who received 2 and ≥3 lines of therapy were obtained from a physician survey in the Kantar Health report. Future studies (e.g., a population-based study) are needed to provide more robust epidemiology inputs.
- Market share data of loncastuximab tesirine-lpyl and other treatments were based on forecasts and assumptions prior to the launch of loncastuximab tesirine-lpyl.
- The model assumed loncastuximab tesirine-lpyl would not impact the market share of CAR-T, which remained constant across all 3 years. This assumption needs to be confirmed with actual market shares observed after the launch of loncastuximab tesirine-lpyl.
- Median treatment durations and adverse event rates in clinical trials were used to estimate treatment costs, and these data may be different from real-world clinical practice.
- Participants in clinical trials are likely to have received closer management and had better adherence to therapies than patients who are treated in real-world settings.
- The administration-related healthcare resource utilization inputs for CAR-T therapy (such as the number of ICU days due to CRS, the number of ICU days not due to CRS, and the number of other inpatient days) were obtained from the clinical trials or assumptions, which may be different from real-world clinical practice. However, as loncastuximab tesirine-lpyl entry was assumed not to impact CAR-T market share, these inputs would not affect the budget impact of loncastuximab tesirine-lpyl.

Conclusions

- In a plan of one million members, adding loncastuximab tesirine-lpyl to the drug formulary for the treatment of adult patients with R/R DLBCL who had received at least 2 prior lines of therapy was predicted to be cost saving in the 3 years after loncastuximab tesirine-lpyl's entry.

References

1. Liu Y, Barta SK. Diffuse large B-cell lymphoma: 2019 update on diagnosis, risk stratification, and treatment. *Am J Hematol*. 2019;94:604-616.
2. ZYNLONTA™ highlights of prescribing information. https://adctherapeutics.com/wp-content/uploads/2021/04/pi.pdf.
3. The market share inputs were estimated based on the Demand study conducted by ADCT in December 2020 (data on file, ADC Therapeutics) and the Kantar Health US treatment pattern questionnaire conducted in February 2021 (CancerMPact® Treatment Architecture, Kantar, www.cancermpact.com, accessed May 17, 2021).

Disclosure

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