Cost-Utility of Belimumab in Treating Lupus Nephritis: A Brazilian Private Healthcare System Perspective

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Introduction

- Lupus nephritis (LN) is characterized by kidney inflammation resulting from systemic lupus erythematosus (SLE), affecting around 40% of patients with this autoimmune disease.[1]
- The BLISS-LN study compared belimumab in combination with standard therapy (ST) versus ST alone (cyclophosphamide and azathioprine or mycophenolate mofetil) to slow deterioration of renal function, measured by the glomerular filtration rate (GFR).[2]
- Cost-utility analysis with BLISS-LN patients helps to determine the most cost-effective intervention (health benefits related to its cost).

Methods

- A Markov model was constructed with six health states for the cost-utility analysis:
  - Three related to estimated GFR (stage I/II chronic kidney disease [CKD]; stage III; stage IV);
  - Three related to end-stage kidney disease (dialysis-dependent; kidney transplant; post-transplant with dialysis dependence).
- With annual cycles and a lifetime horizon, transition probabilities in the first two years were extracted from BLISS-LN; subsequent years were based on relative transition rates from a longitudinal study.[3]
- Utilities and mortality risk were derived from CKD and SLE burden studies. Unit costs were based on the Brazilian private health perspective; the annual discount rate was 5% for costs and outcomes.[4–7]
- Treatment duration with belimumab was three years with continuous ST.[8]

Results

- Base case resulted in BRL 139,885/quality-adjusted life year (QALY) versus ST alone (**Table 1**; **Figure 1**).
- In the probabilistic sensitivity analysis (PSA), the result was cost-effective in 51.3% of simulations considering the Brazilian private system lacks a willingness-to-pay threshold at the moment (BRL 120,000.00/QALY) for severe disease (**Figure 2**).
- All simulations fell within the incremental QALY quadrants. 27.5% fell within the negative incremental cost quadrant.
- Savings can be achieved by avoiding costly medical procedures, such as dialysis.

Table 1: **Base case results**

Belimumab + ST		ST		Cost-utility analysis		
Cost (BRL)	QALY	Cost (BRL)	QALY	Incremental cost (BRL)	Incremental effectiveness (QALY)	ICER
701,680	11.13	668,791	10.90	32,889	0.24	139,885

Figure 1: **Incremental cost details (base case)**

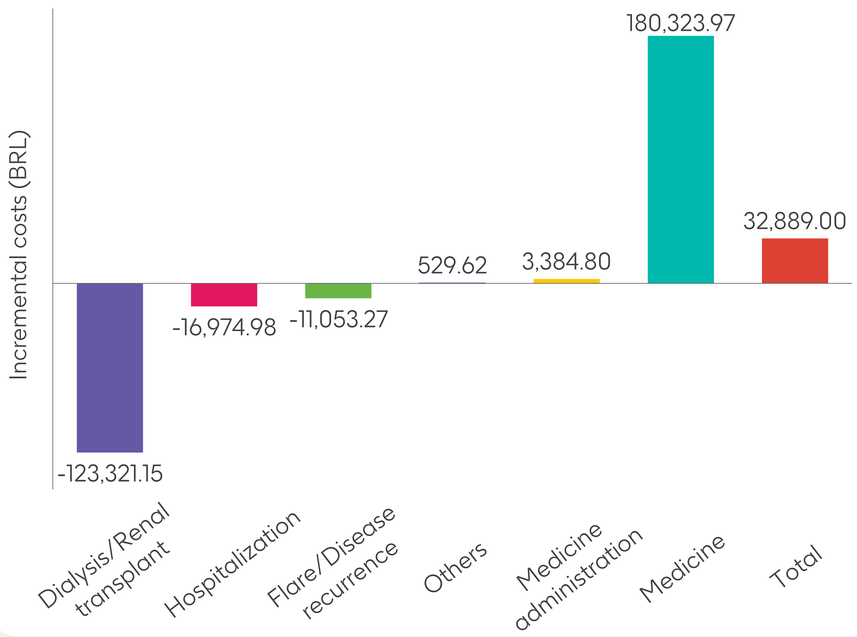
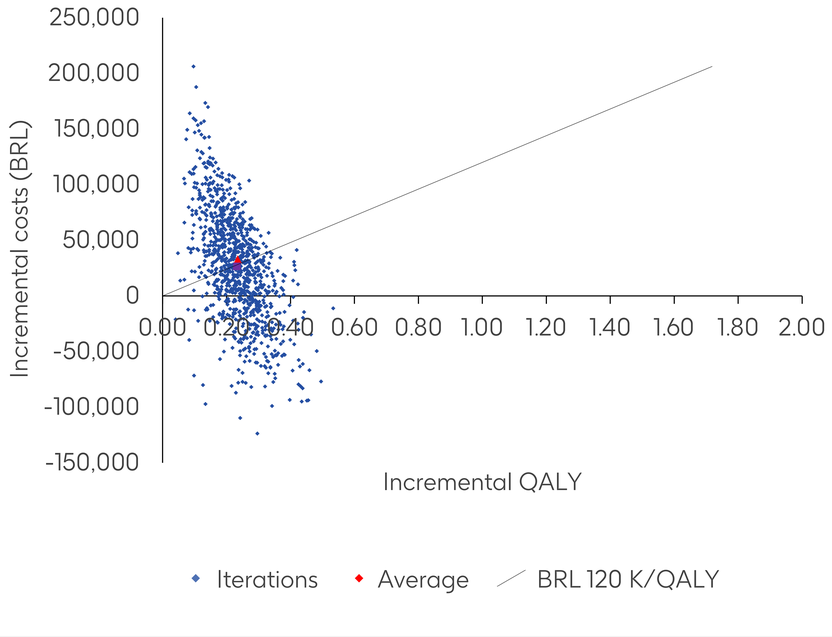


Figure 2: **PSA results**



Conclusion

- Belimumab plus ST reverses or slows the progression of CKD, improving patients' quality of life and survival.
- It may involve higher costs upfront, but it can result in long-term savings on dialysis and transplantation.
- Belimumab plus ST could offer a cost-effective patient journey.

Abbreviations

BRL: Brazilian real; **CKD:** chronic kidney disease; **GFR:** glomerular filtration rate; **ICER:** incremental cost-effectiveness ratio; **LN:** lupus nephritis; **PSA:** probabilistic sensitivity analysis; **QALY:** quality-adjusted life year; **SLE:** systemic lupus erythematosus; **ST:** standard therapy.

References

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Disclosures

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