Comparative Cost Effectiveness of Dapagliflozin and Empagliflozin in Heart Failure with Reduced Ejection Fraction

Prajapati P and Gravlee E

Department of Pharmacy Administration, University of Mississippi School of Pharmacy, University, MS 38677

THE UNIVERSITY OF MISSISSIPPI
Department of Pharmacy Administration

Objectives

- Sodium-glucose transport protein 2 (SGLT-2) inhibitor use among patients with heart failure with reduced ejection fraction (HFrEF) leads to decreased hospitalzations[1] and reduced mortality.[2]
- Two SGLT-2 inhibitors in particular, dapagliflozin and empagliflozin, have been widely examined for heart failure benefit.[3]
- Despite demonstrated benefit with SGLT-2 therapy, no clinical trials directly comparing performance of these drugs exist.
- The **objective** of this project was to compare the cost-effectiveness of two SGLT-2 inhibitors, dapagliflozin and empagliflozin, for the treatment of HFrEF.

Methods

- We developed a Markov model to simulate a cohort of newly-diagnosed HFrEF patients across five years using TreeAge Pro software
- Probabilities of events were gathered from the literature and costs were gathered from Red Book
- Outcomes included hospitalization, mortality, costs, quality-adjusted life years (QALY), and the incremental cost-effectiveness ratio (ICER)
- We conducted one-way sensitivity analyses using tornado diagrams to probe findings.

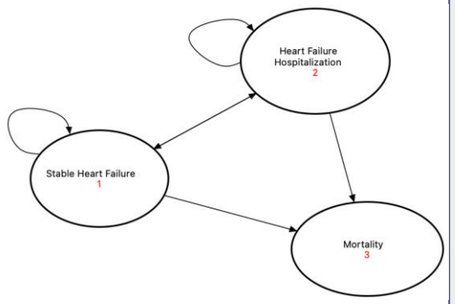

Figure 1. This is the state transition diagram.

Results

- Treatment of HFrEF with dapagliflozin had greater utility and higher total total cost than treatment with empagliflozin.

Table 1. Cost-effectiveness Model Results

Treatment	Total Costs (USD)	Utility (QALY)
Empagliflozin 10 mg Daily	102,836.95	5.31
Dapagliflozin 10 mg Daily	117,487.02	5.67
Incremental Values	*14,650.08*	*0.36*
ICER	***40,834.99***	

- The tornado diagram revealed that the model was sensitive to cost of both drugs at ± 15% base cost.

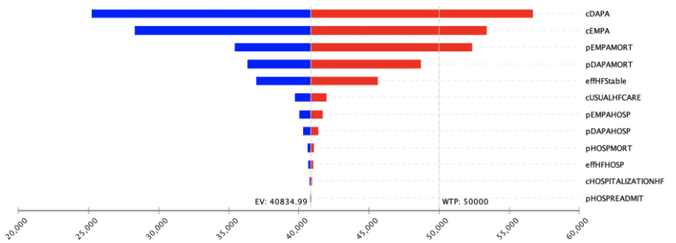

Figure 2. This is the ICER tornado diagram for the analysis.

Conclusions

- Despite the lack of a clearly dominant HFrEF SGLT-2 treatment strategy, dapagliflozin appeared more cost-effective than empagliflozin considering a willingness to pay threshold of 50,000 USD. However, this finding is sensitive to cost of both treatments.
- Further studies, considering additional medications and using potentially more complex modeling, should be performed to assess cost-effectiveness of SGLT-2 inhibitors for treatment of HFrEF.

References

1. Lu Y, Li F, Fan Y, Yang Y, Chen M, Xi J. Effect of SGLT-2 inhibitors on cardiovascular outcomes in heart failure patients: A meta-analysis of randomized controlled trials. *Eur J Intern Med*. 2021;87:20-28. doi:10.1016/j.ejim.2021.03.020.
2. Zannad F, Ferreira JP, Pocock SJ, et al. Cardiac and Kidney Benefits of Empagliflozin in Heart Failure Across the Spectrum of Kidney Function. *Circulation*. 2021;143(4):310-321. doi:10.1161/CIRCULATIONAHA.120.051685.
3. Zannad, F., Ferreira, J. P., Pocock, S. J., et al. (2020). SGLT2 inhibitors in patients with heart failure with reduced ejection fraction: A meta-analysis of the EMPEROR-Reduced and DAPA-HF trials. *The Lancet*, *396*(10254), 819–829. https://doi.org/10.1016/S0140-6736(20)31824-9.