

Cost-effectiveness of dapagliflozin plus standard treatment compared to standard treatment for the management of heart failure with reduced ejection fraction in Colombia

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Introduction

- Heart failure (HF) manifests as symptoms and signs produced by low cardiac output or elevated intracardiac pressure as a result of structural and functional abnormalities of the heart [1].
- In the DAPA-HF study, it was shown that dapagliflozin added to standard treatment reduced the risks of worsening of heart failure or cardiovascular death compared to placebo.

Objective

- To evaluate the incremental cost-effectiveness of the addition of dapagliflozin to the standard treatment compared to the standard treatment for HF with reduced ejection fraction from the perspective of the Colombian health system.

Results

- Base case results show that Dapagliflozin is a cost effective alternative

Table 3. Base case results.

	Dapagli-flozin + SoC	Placebo + SoC	Incremental
Total cost	\$ 4,611.2	\$ 3,808.3	\$ 802.9
Total QALY	2.689	2.554	0.135
ICER (\$/QALY gained)			USD \$5,946

- Results were consistent in subgroups defined by T2DM
- Results were consistent in sensitivity analysis. 97% of simulations showed ICER below the 3 GDP threshold

Methods

- The time horizon was 5 years and with 5% discount rate. We considered a third-party payer perspective. Costs were expressed in US dollars from 2020 (1 USD = \$3,693.36 COP). We considered a cost effectiveness threshold of 3 GDP per capita (US\$ 17,129.9) per additional QALY
- We used a Markov model using a hypothetical cohort of 1000 patients. **Figure 1** shows the model structure.
- DAPA-HF study [1] data were used to model mortality using parametric survival equations, and the incidence of hospitalization (HHF) and urgent visits for heart failure (UHF) using a generalized negative binomial equation.
- Event and health state costs were obtained from literature or form base case healthcare resource utilization with clinical experts. We considered prices from a local tariff manual [2], the latest SIMMED drug price report [10] and the price regulation circulars, in accordance to accepted local methods.
- We performed univariate and probabilistic sensitivity analyses

Figure 1. Model structure

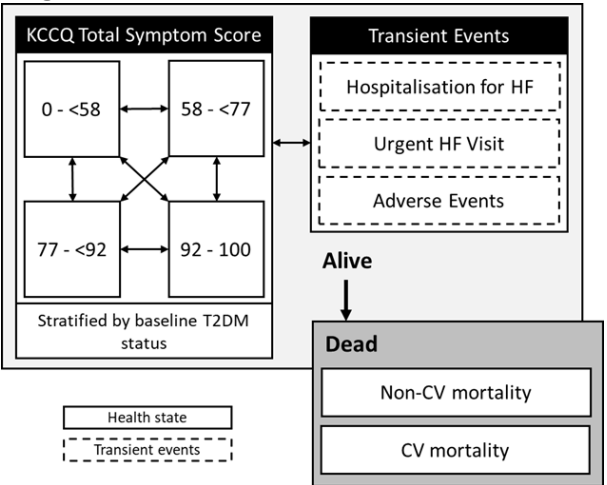


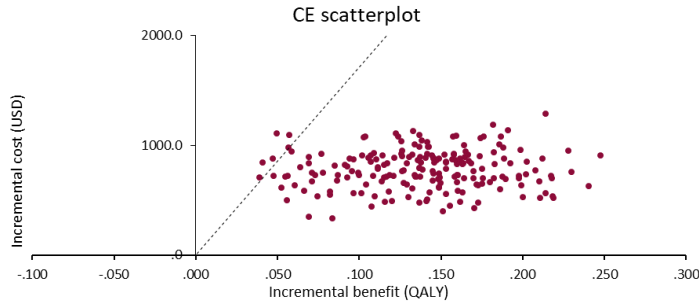
Table 1. Main cost parameters used in the model

Variable	Average	SE	Source
Acquisition costs			
Dapagliflozin + SoC	\$514.0	---	SIMMED[3]
SoC	\$ 142.4	---	SIMMED[3]
Cost of health states			
Heart failure care	\$ 121.1	\$ 12.0	Experts
DM2 ^a	\$ 264.6	\$ 26.5	González et al [4]
HHF ^b	\$ 2,422.3	\$ 242.2	Tamayo et al [5]
UHF	\$ 163.9	\$ 16.4	Experts
CV death ^c	\$ 3,944.6	\$ 394.5	Mendoza et al. [6]
Cost of adverse events			
Volume depletion ^d	\$ 17.2	\$ 1.7	McMurray et al [7]
Renal events ^e	\$ 29.4	\$ 2.9	McMurray et al [7]
Hypoglycemic events ^f	\$ 226.4	\$ 22.6	Enciso [8]
Fractures ^g	\$ 873.9	\$ 87.4	García et al [9]
Diabetic ketoacidosis ^h	\$ 548.4	\$ 54.8	Experts
Amputation ^h	\$ 6,870.8	\$ 687.1	Experts

Table 2. Utilities employed in the model and discontinuation probability

Health state	Average	SE	Source
Utilities			
KCCQ TSS: 1 - <58	0.600	0.016	DAPA-HF [1]
KCCQ TSS: 58 - <77	0.705	0.016	DAPA-HF [1]
KCCQ TSS: 77 - <92	0.773	0.016	DAPA-HF [1]
KCCQ TSS: 92 - 100	0.833	0.016	DAPA-HF [1]
DM2 (decrease)	0.017	0.003	DAPA-HF [1]
HHF (decrease)	0.321	0.020	DAPA-HF [1]
UHF (decrease)	0.036	0.011	DAPA-HF [1]
Volume depletion	0.051	0.012	DAPA-HF [1]
Renal events	0.076	0.014	DAPA-HF [1]
Hypoglycemic events	0.014	0.001	Currie et al, [10], Beaudet et al, [11]
Fractures	0.149	0.033	DAPA-HF [1]
Diabetic ketoacidosis	0.000	0.000	Assumption
Amputation	0.280	0.053	UKPDS 62 [12], Beaudet et al, [11]
Others			
Discontinuation of dapagliflozin (%)	7.00	7.00	DAPA-HF [1]

Figure 2. Probabilistic sensitivity analysis



Conclusions

- The addition of dapagliflozin to standard treatment is a cost-effective option in patients with heart failure with reduced ejection fraction in Colombia.
- The intervention remains a cost-effective option within the different analysis subgroups, obtaining a better cost-effectiveness ratio in patients with DM2 as comorbidity.

References

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