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Cost-effectiveness analysis of dapagliflozin in addition to standard therapy in heart failure with reduced ejection fraction: A Qatari healthcare perspective

Daoud Al-Badriyeh[1], Salma Chbib[2], Palli Valapila Abdulrouf[2], Moza Al Hail[2], Wessam El Kassem[2], Dina Abushanab[2,3,*]

[1]College of Pharmacy, QU Health, Qatar University, Doha, Qatar
[2]Pharmacy Department, Hamad Medical Corporation, Doha, Qatar
[3]School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia
*Email: dabushanab@hamad.qa

ABSTRACT

Background: Dapagliflozin has been shown to reduce the risk of heart failure hospitalization and cardiovascular mortality in patients with heart failure with reduced ejection fraction (HFrEF).[1,2] This work aims to determine the cost-effectiveness of dapagliflozin added to standard therapy versus standard therapy alone in patients with HFrEF, regardless of the presence or absence of type 2 diabetes mellitus (T2DM).

Methods: A lifetime Markov model was constructed to compare the health outcomes and costs of dapagliflozin added to standard therapy versus standard therapy alone from a Qatari public healthcare perspective (Figure 1).[2] The cohort is comprised of HFrEF patients with left ventricular ejection fraction (LVEF) ≤40%, and New York Heart Association (NYHA) class II–IV with an average age of 65 years, based on Dapagliflozin and Prevention of Adverse-Outcomes in Heart Failure (DAPA-HF) trial (Table 1).[1,2] The model consisted of three health states: 'stable', 'hospitalization for heart failure', and 'dead'. Clinical inputs were derived from the results of DAPA-HF trial and costs, and utilities were estimated from published sources as well as publicly available sources in Qatar.[3] The main outcome was the incremental cost-effectiveness ratio (ICER) per quality-adjusted life-year gained (QALY). All outcomes and costs were discounted at a rate of 3% annually. Sensitivity analyses were conducted to confirm the robustness of the results. The study was based on published data; therefore ethics approval was not required.

Results: Dapagliflozin added to standard care prevented 112 heart failure hospitalization and resulted in an additional cost of QAR 33,890 (USD 9,309). This equated to an ICER of QAR 101,763 (USD 27,951) per QALY gained, below the US willingness-to-pay threshold of USD 150,000 per QALY gained. Sensitivity analyses showed the findings to be robust.

Conclusion: Dapagliflozin in addition to standard care appears to be a cost-effective strategy for patients with HFrEF, regardless of the presence or absence of T2DM.

Keywords: Dapagliflozin, Diabetes, Heart failure, Cost-effectiveness, Qatar

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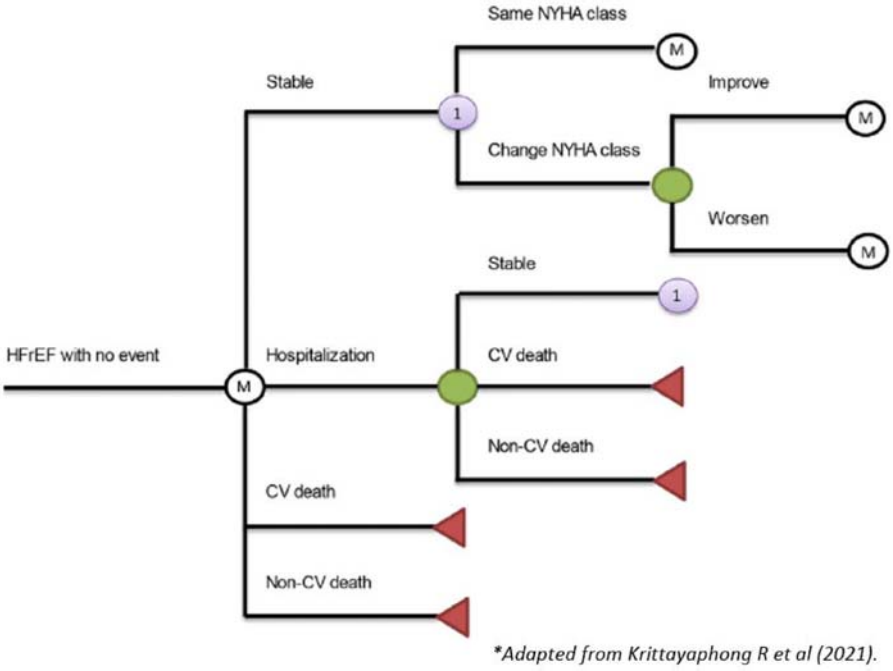

Figure 1. A lifetime Markov model.

Table 1. Transition probabilities for the base-case analysis, variation range and distribution

Parameter	Point estimate	Variation range		Point estimate	Variation range		Distribution
	Dapagliflozin added to standard of care	Lower	Upper	Standard of care	Lower	Upper	
Transition probabilities for cycle 1 and beyond							
Hospitalization for HF	0.017	0.013	0.021	0.023	0.017	0.029	Triangular
HF rehospitalisation	0.689	0.517	0.861	0.689	0.517	0.861	Triangular
CVD death	0.016	0.012	0.020	0.020	0.015	0.025	Triangular
Non-CVD death	0.003	0.002	0.004	0.004	0.003	0.005	Triangular

**Transition probabilities variation was assumed to be ±25% of the mean estimate. In the sensitivity analysis, using 10,000 iterations, all parameters were assigned distribution and varied jointly. The Triangular distribution was applied to the transition probabilities. Sensitivity analysis was performed using @Risk-7.5® (Palisade Corporation, NY, USA).*

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