Evaluating the key predictors of health-related quality of life in patients with heart failure and reduced ejection fraction: results from the DAPA-HF trial

P. McEwan[1], J.J.V. McMurray[2], P.S. Jhund[2], K.F. Docherty[2], L. Qin[3]

[1]Health Economics and Outcomes Research Ltd., Cardiff, United Kingdom; [2]University of Glasgow, Glasgow, United Kingdom; [3]AstraZeneca, Health Economics and Payer Analytics, Gaithersburg, United States of America

Funding Acknowledgement: Type of funding sources: Private company. Main funding source(s): AstraZeneca

Background: The DAPA-HF trial demonstrated that dapagliflozin was superior to placebo at preventing cardiovascular death and hospitalisation for heart failure (hHF) events in patients with chronic heart failure with reduced ejection fraction (HFrEF). The trial also demonstrated a clinically important benefit of dapagliflozin on health-related quality of life (HRQoL). However, key predictors of HRQoL in HFrEF patients remain uncertain. The objective of this study was to determine, using DAPA-HF trial data, the patient characteristics and disease-related events associated with patient HRQoL, measured by health state utility values.

Methods: Mixed effects regression models were developed based on pooled individual patient data from DAPA-HF to determine patient utility estimated from responses to the EQ-5D-5L questionnaire, incorporating a subject specific random intercept. In line with NICE guidance, utility estimates were derived using UK-specific utility tariffs after mapping EQ-5D-5L data to EQ-5D-3L values. Univariable analysis was first undertaken to assess candidate predictors of utility; followed by a multivariable model including statistically significant predictors, e.g. Kansas City Cardiomyopathy Questionnaire Total Symptom Score (KCCQ-TSS) and the incidence hHF events, and controlling for differences in baseline characteristics. All variables were included in a single model to provide independent (adjusted) estimates for each covariable.

Results: 19,983 EQ-5D-5L questionnaires from 4,744 patients were included. Mean patient utility at baseline was 0.716 (95% CI: 0.711, 0.722). Univariable analysis demonstrated NYHA, KCCQ-TSS, T2DM, BMI, age, geographic location, non-ischaemic/unknown aetiology and atrial fibrillation were statistically significant in their association with patient utility while prior hHF, race, eGFR and left ventricular ejection fraction were not.

Multivariable analysis results are summarised in Fig. 1. The baseline characteristic with the greatest impact on EQ-5D was KCCQ-TSS quartile, with EQ-5D increasing with KCCQ-TSS and the difference in utility between patients in quartile 1 (lowest score) and quartile 4 (highest score) estimated at 0.233 (0.226, 0.240).

When controlled for baseline characteristics, being post-event was significantly associated with HRQoL; patients who experienced hospitalisation for HF had 0.036 (0.014, 0.058) lower utility on average within one month of the event and 0.025 (0.011, 0.039) lower utility up to one-year after the event. For patients who had stroke or myocardial infarction events there were reductions in utility of 0.206 (0.141, 0.272) and 0.108 (0.039, 0.177) respectively at 1 month.

Conclusion: HF symptoms, measured by the KCCQ, were strongly associated with patient health utility. Therapeutic interventions that can improve HF symptoms have the potential to improve HRQoL and reduce the burden of HF.

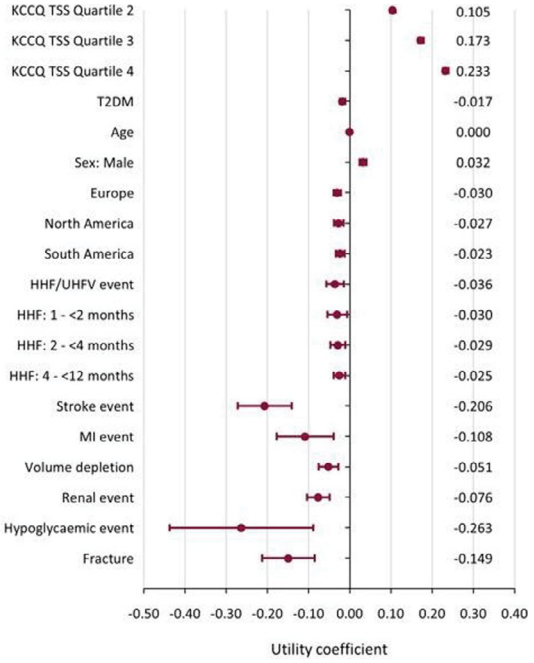

Figure 1 Utility coefficients for baseline patient characteristics and post-event

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