Physician Prediction Versus Model Predicted Prognosis in Ambulatory Patients with Heart Failure

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INTRODUCTION

Heart failure (HF) is a large and growing medical and economic problem, with over 26 million people suffering worldwide. A key strategy to mitigate the clinical and economic burden of HF is reliable prognostic assessment to facilitate patient management and to ensure timely use of treatment to increase survival, decrease hospitalization, improve quality of life and optimize use of limited health-care resources.

Previous evidence suggests that both cardiologists and family doctors have limited accuracy in predicting patient prognosis. Predictive models with satisfactory accuracy for estimating mortality in HF patients exist; physicians, however, seldom use these models. We evaluated the relative accuracy of physician versus model prediction to estimate 1-year survival in ambulatory HF patients.

METHODS

We conducted a single centre cross-sectional study involving 150 consecutive ambulatory HF patients >18 years of age with a left ventricular ejection fraction ≤40%. Each patient's HF cardiologist and family doctor provided their predicted 1-year survival.

Using clinical and laboratory data collected at the time of enrollment we calculated predicted survival using three models: the HF Meta-Score, the Seattle Heart Failure Model (SHFM) and the Meta-Analysis Global Group in Chronic HF (MAGGIC) score. We compared accuracy between physician and model predictions using intra-class correlation (ICC).

A subset of physicians were contacted to determine (1) whether or not they routinely use any predictive models for estimating survival in patients with HF and (2) reason(s) for not using any model.

Figure 1. Agreement between HF cardiologists and model 1-year predicted survival scores

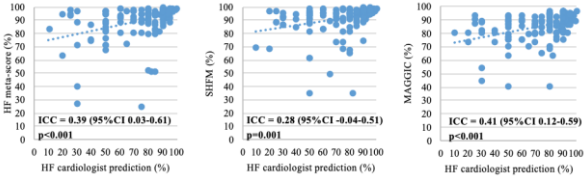
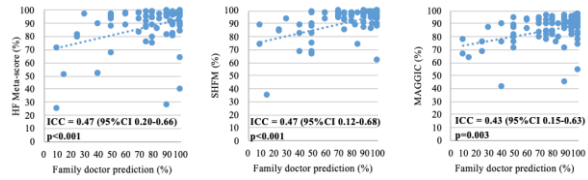


Figure 2. Agreement between family doctors and model 1-year predicted survival scores



RESULTS

Patients enrolled in this study were predominantly white (70%), male (81%), with an average age of 59 ± 14 years, New York Heart Association Class II HF (47%), an average left ventricular ejection fraction of 27 ± 8% and a history of at least 1 hospital admission due to HF. Most were prescribed beta-blockers (95%), ACE inhibitors or angiotensin receptor blockers (81%), spironolactone (76%), furosemide (68%), and statins (59%) as part of their medical therapy at the time of enrollment. Over half the patients enrolled had an ICD and/or CRT.

Median predicted survival by HF cardiologists was lower (median 80%, IQR 61-90%) than that predicted by family doctors (median 90%, IQR 70-99%, p=0.08). The 1-year median predicted survivals calculated by the HF Meta-Score (94.6%), SHFM (95.4%) and MAGGIC (88.9%) proved as high or higher than physician estimates. Agreement among both HF cardiologists (ICC 0.28-0.41) and family doctors (ICC 0.43-0.47) when compared to 1-year model-predicted survival scores proved limited, while the 3 models agreed well with one another (ICC >0.65).

Figure 3. Physician reasons for not using a predictive model for HF patients

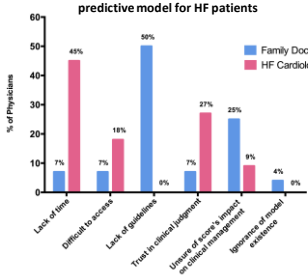
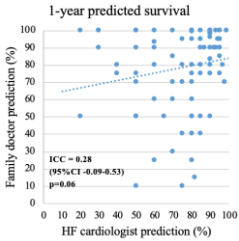


Figure 4. Agreement between 1-year predicted survival scores by HF cardiologists and family doctors



LIMITATIONS

While this study does not yet provide data on outcomes to compare predicted and observed survival, our data provides insights as the the existing discrepancies in risk prediction, and initial support that there may be a role for incorporating prediction models into clinical practice to more accurately estimate prognosis in ambulatory patients with HF.

CONCLUSION

We found that median survival estimates are lower among HF cardiologists in comparison to family doctors, while both physician estimates are lower than calculated model estimates. Considering previous evidence that model's accuracy is acceptable and physicians' is limited, our results provide additional evidence of the superior accuracy of predictive models 1-year survival in ambulatory HF patients. These results should be validated in longitudinal studies collecting actual survival.

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