experienced MRI radiographer could be trained to report these studies as a way of relieving pressure upon the cardiac service.

Method

100 sequential Herceptin MRI studies were performed on a Philips Ingenia 1.5 tesla MRI scanner.

The lead cardiac radiographer with 8 years of cardiac MRI experience was trained to use Medis suite MR version 3.2 (published by Medis medical imaging systems) software package by a senior cardiologist.

The appointment time for each patient was 30 minutes with 15 minutes of actual scanning time.

The sequences used were: Black blood axial stack. Balanced Gradient echo Cine sequences performed in 2 chamber(CH), 4CH and 3CH planes with a short axis cine stack (SAX) prescribed through the entirety of left ventricle.

LV volume and EF were measured from the SAX.

Each study was reported separately by an imaging consultant and by the radiographer who were blind to each-others reports.

Results

Results are shown in figure 1 below

Of the 100 studies reported: 95 had a measured EF difference of 2% or lower between reporters. Of the remaining 5, only 1 had an EF difference greater than 4%.

The higher percentage difference in this case was 13%, due to the fact that the patient had a prosthetic mitral valve in situ, artefact from which rendered measurements unreliable. This case was evaluated by three other imaging consultants (blinded to the original results) and the EF measurements ranged from 44% to 62%.

Conclusion

We have shown that a trained and experienced MRI radiographer calculates LVEF with low levels of variation. (+/- 2% in 95% of cases). This compares favourably with published data comparing the reproducibility of LVEF measurements between imaging consultants (Bhuva et al. 2019, George 2017)

The difficulty in assessment of LV function in the presence of a prosthetic Mitral valve is widely accepted (Gulsin et al. 2017, Shellock 2016) and resulted in an extreme outlier in the results. The consequent variation in opinion between imaging consultants is evidence that this discrepancy was due to the presence of significant artefact form the prosthesis.

The reporting radiographer is now awaiting trust approval to commence independently reporting Herceptin cases. This study has also highlighted the potential for radiographer reporting in other areas of cardiac MRI which we intend to explore.

Conflict of Interest

none

58 FIRST-PHASE EJECTION FRACTION PREDICTS RESPONSE TO CARDIAC RESYNCHRONIZATION THERAPY AND ADVERSE OUTCOMES

Background

Cardiac Resynchronization Therapy (CRT) is an important therapeutic treatment for chronic heart failure. However, even in carefully selected cases up to 40% of patient fail to respond. First-phase ejection fraction (EF1), the ejection fraction up to the time of maximal ventricular contraction, is a novel and more sensitive echocardiographic measure of early systolic function. We examined the value of EF1, to predict response to CRT and clinical outcomes after CRT.

Methods

Echocardiography was performed in 197 patients (table 1) who underwent CRT between 2009 and 2018 and were followed to determine clinical outcomes. LV volumes were measured by 2D Simpson’s method from apical views at end-diastole, time of peak aortic valve flow and end-systole to give end-diastolic volume (EDV), volume at TPAVF (V1) and ESV. 3D echocardiography was performed in a sub-sample of patients (n=73) allowing automated determination of EF1. EF1 was calculated as the percentage change between EDV and V1:

\[ EF1 = \frac{(EDV - V1)}{EDV} \times 100\% \]

Results

Volumetric response rate (reduction in end-systolic volume ≥ 15%) was 92.3% vs. 12.1%, for those with EF1 in the highest vs. lowest tertiles (p<0.001). A cut-off value of 11.9% for EF1 had > 85% sensitivity and specificity for prediction of response to CRT; on multivariate binary logistic regression analysis incorporating previously defined predictors (table 2) EF1 was the strongest predictor of response (odds ratio: 1.563, 95% confidence interval: 1.371-1.782, per 1% change in EF1, p<0.001). EF1 was also the strongest predictor of a clinical composite score (odds ratio: 1.115, 95% confidence interval: 1.044-1.191, p=0.001). The c-statistic index
for a logistic model (including age, gender, presence of AF, ischaemic aetiology, SF, ApRock, presence of LBBB and QRS duration) increased significantly by adding EF1 (from 0.720 to 0.922: change in the c-statistic 0.202, p<0.01).

Improvement in EF1 at 6 months (figure 1) after CRT implantation (6.5±5.8% vs 1.8±4.3% in responders vs. non-responders, p<0.001) was the best predictor of heart failure re-hospitalization and death after median follow-up of 29.2 months (HR: 0.819, 95%CI:0.765-0.876, p<0.001) (figure 2).

Conclusion EF1, a simple measure of early systolic function, is a promising predictor of response to CRT and may be useful in selecting patients for CRT and as a target for optimising CRT and other measures to improve outcomes in patients with HFrEF.

Conflict of Interest None

**CAN HEART FAILURE NURSE SPECIALISTS USE THE SURPRISE QUESTION TO IMPROVE PATIENT ACCESS TO PALLIATIVE CARE SERVICES?**

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**Introduction** Severe chronic heart failure (CHF) has a high symptom burden due to breathlessness, fatigue and fluid retention, comparable to many types of cancer but despite this, patients are often not referred to palliative care services. The ‘Surprise Question’ - ‘would you be surprised if this patient were to die within the next year?’ has been proposed as a screening tool to prompt earlier recognition that patients are nearing the end of life. It forms part of the Gold Standards Framework and is included in the National Institute of Health and Clinical Excellence (NICE) guidance for end-of-life care. We have previously demonstrated the ability of this simple and intuitive question to predict mortality in hospitalised CHF patients and that it can be used by cardiologists and heart failure nurse (HFN) specialists with similar levels of accuracy.

**Aims** We aimed to determine whether the Surprise Question could influence advanced care planning and referrals to palliative care in hospitalised CHF patients.

**Methods** Retrospective analysis of 89 hospitalised CHF patients who received either a ‘surprised’ or ‘not surprised’ response from their HFN. We analysed the rate of referral to palliative care, completion of not-for-resuscitation status, readmission with decompensation and mortality after 2-years.

**Results** Sixty patients (67%) received a ‘not surprised’ and 29 (33%) a ‘surprised’ response. In patients who received a ‘not surprised’ response, 25 (28%) were referred to palliative care within the study period, compared to 0 (0%) in the ‘surprised’ group. The median time from study enrolment to referral was 55 days, which was on average 19 days before death, but occurred within 30-days of enrolment for only 8 patients. Not-for-resuscitation status was completed for 11% and 3% of patients, respectively. The Surprise Question also predicted readmission with decompensation, occurring in 25 (42%) and 4 (14%), and continued to predict mortality beyond 1-year with 35 (58%) and 4 (14%) patients having died respectively.

**Discussion** Our analysis highlights the potential of the Surprise Question to act as a prompt for earlier referral to palliative care services and advanced care planning. Decompensation of heart failure is a poor prognostic sign, but despite this there was a low rate of not-for-resuscitation decisions during the index admission, and referrals to palliative care were usually made shortly before death. In the future we aim to assess in a randomised controlled trial whether the introduction of the Surprise Question into routine clinical care can achieve these aims. HFNs are able to use the Surprise Question with similar levels of accuracy to cardiologists and are the point of contact for patients with whom they have regular interaction. HFN are therefore ideally placed to develop relationships conducive to palliative care planning and can lead in this area.

**Conflict of Interest** None

**Abstracts**

**Abstracts**

**Abstract 59 Figure 1**

**Abstract 59**

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