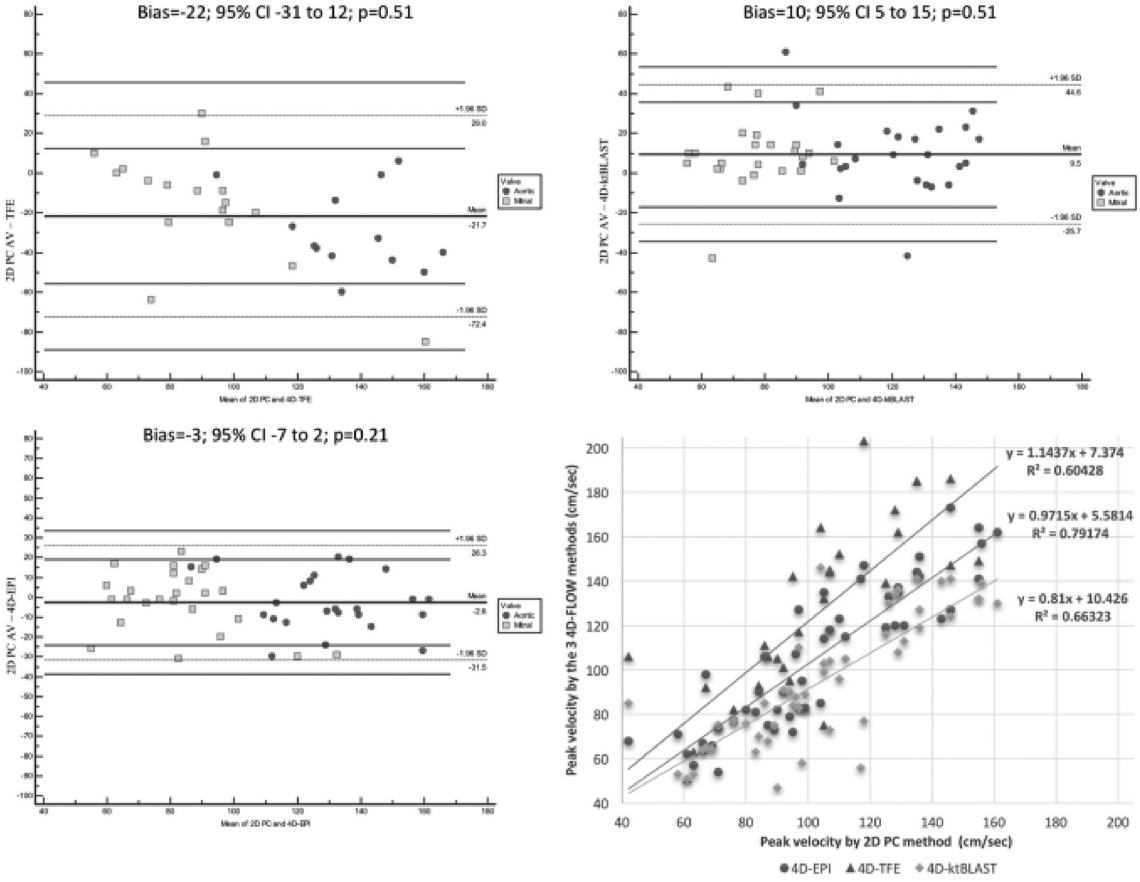

Abstract 026 Figure 2 Bland Altman analysis and scatter plots for the assessment of peak velocity using all the acceleration methods.

pulsatile phantoms (Figure 1) and 25 volunteers. In volunteers, the CMR protocol included: cines, 2D phase contrast (PC) at the aortic valve (AV) and mitral valve (MV) and three whole-heart free-breathing (no respiratory motion correction) 4D flow CMR pulse sequences. Field-of-view, slices, phases (30), voxel size and VENC were the same for each subject. In volunteers, net acquisition time for each 4D flow sequence was recorded, as well as a visual grading of image quality on a four-point scale: 0, no artefacts to 3, non-evaluable.

Results For the pulsatile phantom experiments, the mean error against the reference flow by time beaker measurements for 4D-TFE was 4.9%±1.3%, for 4D-EPI 7.6%±1.3% and for 4D-*k-t* BLAST 4.4%±1.9%. *In vivo*, acquisition time was shortest for 4D-EPI at 7 min59s±2 min30s. 4D- EPI and 4D-*k-t* BLAST had minimal artefacts, while for 4D-TFE, 40% of AV and MV assessments were non-evaluable because of phase dispersion artefacts. Peak velocity assessment using 4D-EPI demonstrated best correlation to 2D PC (AV: r=0.78, p<0.001; MV: r=0.71, p<0.001). Coefficient of variability (CV) for net forward flow (NFF) volume was least for 4D-EPI (7%) (2D PC:11%, 4D-TFE: 29%, 4D-*k-t* BLAST: 30%, respectively) (Figure 2, 3).

Conclusion Of the three 4D flow CMR methods tested, 4D-EPI demonstrated the least susceptibility to artefacts, good image quality, modest agreement with the current reference standard for peak intra-cardiac velocities and the highest consistency of intra-cardiac flow quantifications.

Competing interests The authors declare that they have no competing interests.

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027 T2 MAPPING IN ACUTE AND RECOVERED MYOCARDITIS: POTENTIAL ROLE IN CLINICAL SURVEILLANCE

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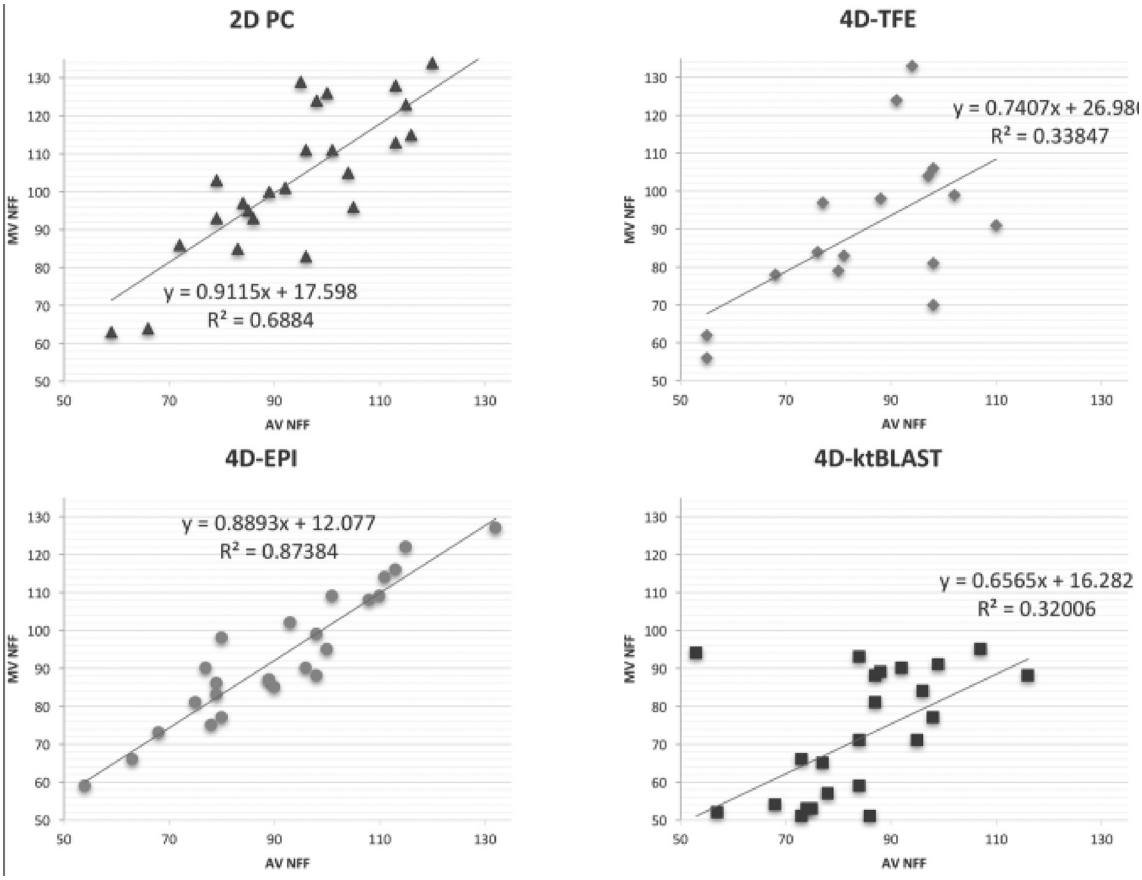
Background Acute myocarditis (AM) remains a challenging diagnosis with poorly defined markers of chronic active disease and/or progression to dilated cardiomyopathy. T2 mapping allows quantitative assessment of low- level myocardial oedema[1] but requires further clinical evaluation alongside conventional biomarkers (troponin and BNP) prior to large-scale application.[2]

Aim To prospectively evaluate the role of T2 mapping in the clinical surveillance of acute myocarditis.



Abstract 026 Figure 3 Scatter plots of net forward flow (NFF) through the mitral and aortic valve to investigate consistency between all the four methods.

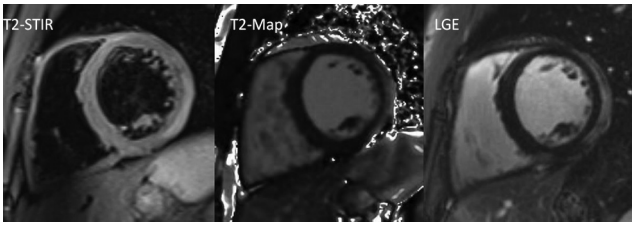
Methods T2 mapping was performed using T2-prepared balanced steady-state free-single shot-images on a 3 Tesla system (Skyra, Siemens) in the following patient groups:

- Prospective patients with AM defined by clinical presentation and 2 out of 3 Lake Louise Criteria (n=11, mean age 34±10 years, all male) scanned at baseline and 3 months.
- Retrospective patients with a history of AM (n=12, mean age 35±13 years, all male) scanned 5.7±3.9 years from acute presentation.
- Healthy volunteers (n=9, mean age 27±6 years, 56% male).

Troponin-I and BNP were measured at the time of CMR in all patients. A global region of interest was manually drawn by a single blinded observer in the basal short-axis slice (see figure 1).

Results In patients with acute myocarditis, mean global T2 was 42±1.4 msec compared to 40±1.3 msec in healthy volunteers ($p<0.005$). No difference was found between T2 values at presentation and 3 month follow-up ($p=0.1$), although the range of T2 values was greater at 3 months (see figure 2). In the retrospective group, mean T2 normalised to 40±1.5 msec with preserved ventricular function, comparable to healthy volunteers. Troponin normalised at follow-up in all patients, whereas BNP remained elevated in 3 patients (mean 23 ng/mL).

Conclusion Our findings suggest that T2 values remain persistently elevated at 3 months following acute presentation despite normalisation of cardiac troponin levels. Increased variability in T2 values at 3 months is likely to have arisen from heterogeneity in tissue changes, unlikely to be reflected by standard AHA segments. Statistical tools such as mean absolute standard deviation (madSD)[3] may improve the potential benefit of T2 mapping beyond single T2 cut-off values in this small but important subsets of patients.



Abstract 027 Figure 1 T2-STIR and T2 mapping at the basal short-axis level in a patient with acute myocarditis affecting the lateral wall. The late gadolinium enhancement image is provided for reference.

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