**Background** The success of emergency coronary reperfusion therapy in ST-elevation myocardial infarction (STEMI) is commonly limited by failed tissue perfusion.
**Purpose** To assess the clinical significance of myocardial haemorrhage using cardiac magnetic resonance (CMR) in survivors of acute STEMI and assess the temporal evolution of intramyocardial haemorrhage (IMH) versus microvascular obstruction (MVO) in a serial imaging subset.
**Methods** 286 reperfused STEMI patients underwent CMR 2-days and 6-months post-MI. IMH was taken to represent a hypointense infarct core with a T2* value <20 ms. 30 STEMI patients underwent serial CMR at 4 time points: 4–12 h, 3-days, 10-days and 6–7 months post reperfusion. Cardiovascular death or heart failure hospitalisation (CVD/HF) was independently assessed during follow-up.
**Results** 245 STEMI patients had evaluable T2* data and 101 (41%) patients had IMH. 133 (51%) patients had MVO. All of the patients with IMH had MVO. IMH was multivariably associated with adverse remodelling, independent of baseline LVEDV (OR (95% CI): 2.64 (1.07, 6.49); p = 0.035). IMH was also multivariably associated with CVD/HF post-discharge (HR (95% CI): 12.9 (1.6, 100.8); p = 0.015).

In the serial imaging subgroup, IMH occurred in 7(23%), 13(43%), 11(33%), and 4(13%) patients at 4–12 h, 3-days, 10-days and 7-months, respectively. The amount of MVO was greatest 4–12 h post-reperfusion, then fell progressively over time. In contrast, the amount of IMH increased dynamically from 4–12 h with a peak at 3 days. MVO resolved by day 10 in 8 patients (44%), 2 (25%) of whom had IMH. Whereas MVO persisted in 10 patients (56%), all (100%) of whom had IMH.
**Conclusion** IMH is independently associated with adverse remodelling and ACD/HF post-discharge. T2* imaging differentiates persistent, structural microvascular destruction from functional, potentially reversible MVO. IMH is a biomarker with potential to reflect the efficacy of therapeutic interventions in STEMI patients.

## 9 SEX DIFFERENCES IN CIRCUMFERENTIAL AND LONGITUDINAL STRAIN ASSESSED USING STRAIN ENCODED CARDIAC MAGNETIC RESONANCE AT 3.0T

[1,2]G Clerfond, [1,2]K Mangion, [1,2]D Carrick, [1]SM Rauhalammi, [1,2]D Corcoran, [1]P Hall Barrientos, [1]C McComb, [1]J McClure, [1]A Radjenovic, [1,2]C Berry. *[1]BHF Glasgow Cardiovascular Research Centre, University of Glasgow, UK; [2]West of Scotland Heart and Lung Centre, Golden Jubilee National Hospital, Clydebank, UK*

10.1136/heartjnl-2015-307845.9

**Background** Displacement encoding with stimulated echoes (DENSE) encodes myocardial tissue displacement into the phase of the MRI image, thus allowing direct quantification of myocardial displacement at multiple cardiac phases. Strain-encoded CMR with DENSE has high spatial (3.2 mm × 3.2 mm × 8 mm) and temporal resolution (TR= 27.34 ms). We aimed to measure myocardial strain values with DENSE in healthy adults across a broad age range at 3.0 Tesla.
**Methods** Healthy volunteers with no prior medical history or treatment were enrolled and underwent CMR at 3.0T (Magnetom Verio, Siemens healthcare, Erlangen, Germany). Mid-left ventricular short axis and horizontal long axis DENSE sequences were acquired and analysed using CIM_DENSE2D software (University of Auckland, New Zealand and Siemens Healthcare). Segmental and global myocardial circumferential (Ecc) and longitudinal (Ell) strain were obtained.
**Results** Ecc and Ell were analysed in 77 volunteers (mean age 45 ± 18 years, 49% male) (Table 1). Mean Ecc strain was greater in women than in men. These sex-differences were mainly related to strain values in the anterior and antero-lateral LV segments. There is no difference for Ell.
**Conclusion** Left ventricular circumferential contractility differs between men and women, and the differences were regionalised to the antero-lateral myocardial regions where LV displacement is greatest.
**Funding** Medical Research Scotland project grant. Professor Berry was supported by a Senior Clinical Fellowship from the Scottish Funding Council.

**Abstract 9 Table 1** Gender differences in Circumferential and Longitudinal Strain at 3T

| | Men | Women | p-value |
|---|---|---|---|
| Ecc (%)* | (n = 38) | (n = 39) | |
| Mean | 18.19 ± 1.5 | 19.42 ± 2.8 | 0.020 |
| Anterior | 19.03 ± 3.4 | 21.29 ± 3.7 | 0.008 |
| Antero-septal | 17.13 ± 2.9 | 18.05 ± 3.7 | 0.235 |
| Infero-septal | 15.43 ± 2.9 | 16.48 ± 3.7 | 0.178 |
| Inferior | 19.56 ± 3.2 | 20.57 ± 4.2 | 0.241 |
| Infero-lateral | 21.06 ± 3.1 | 21.33 ± 4.2 | 0.760 |
| Antero-lateral | 19.56 ± 3.0 | 21.66 ± 3.9 | 0.01 |
| Ell (%)* | | | |
| Mean | 10.53 ± 2.4 | 11.66 ± 2.6 | 0.052 |
| Basal-septal | 8.79 ± 4.10 | 10.54 ± 4.6 | 0.083 |
| Mid-septal | 12.20 ± 3.6 | 11.83 ± 4.4 | 0.687 |
| Apico-septal | 14.53 ± 5.0 | 16.98 ± 4.2 | 0.024 |
| Basal-lateral | 12.83 ± 4.5 | 15.29 ± 4.7 | 0.021 |
| Mid-lateral | 12.55 ± 4.1 | 12.56 ± 4.3 | 0.992 |
| Apico-lateral | 13.55 ± 4.3 | 13.40 ± 4.4 | 0.801 |

*Values expressed as mean ± standard deviation

## 10 SEX DIFFERENCES IN CIRCUMFERENTIAL AND LONGITUDINAL STRAIN REVEALED BY STRAIN-ENCODED CARDIAC MAGNETIC RESONANCE IN HEALTHY VOLUNTEERS AT 1.5T

[1,2]G Clerfond, [1,2]K Mangion, [1,2]D Carrick, [1]SM Rauhalammi, [1,2]D Corcoran, [1]P Hall Barrientos, [1]C McComb, [1]J McClure, [1]A Radjenovic, [1,2]C Berry. *[1]BHF Glasgow Cardiovascular Research Centre, University of Glasgow, UK; [2]West of Scotland Heart and Lung Centre, Golden Jubilee National Hospital, Clydebank, UK*

10.1136/heartjnl-2015-307845.10

**Background** Displacement encoding with stimulated echoes (DENSE) encodes myocardial tissue displacement into the phase of the MRI image, thus allowing direct quantification of myocardial displacement at multiple cardiac phases. Strain-encoded CMR with DENSE has high spatial (3.2 × 3.2 × 8 mm) and temporal resolution (32.5 ms phase). We aimed to measure myocardial strain values with DENSE in healthy adults across a broad age range at 1.5 Tesla.
**Methods** Healthy volunteers with no prior medical history (including cardiovascular health problems or medication) were enrolled and underwent CMR at 1.5T (Magnetom Avanto, Siemens Healthcare, Erlangen, Germany). Mid-left ventricular short axis and horizontal long axis DENSE sequences were