further assessment of ischaemic heart disease, cardiomyopathy or congenital heart disease. CMR demonstrated significant clinical impact on 68% of patients. This included a completely new diagnosis in 27% of patients, change in management in 31% and 10% of patients that had both a new diagnosis and change in management. CMR results promoted invasive procedures on 27%, avoided invasive procedures on 16%; and influenced on hospital discharge on 15% of the patients (Figure 1). 84% of the patients had echocardiography prior to CMR. CMR confirmed echo diagnosis in 11%, complemented echo findings with significant new information in 41% and changed the echo diagnosis in 30% of the cases. In a multivariable model that included clinical/imaging parameters, age and presence of LGE were the only independent predictors of "significant clinical impact" (LGE p-value .007, OR 2.782, CI 1.328–5.828) (Table 1).

Conclusions CMR had significant impact in patient's diagnosis and management in 68% of acutely hospitalised patients. Presence of LGE was the only independent predictor of significant clinical impact following CMR.

Abstract 7 Table 1 Logistic Regression Variables in the Equation

	Sig.	Odds ratio	95 Conf. Interval	
			Lower	Upper
Sex	.486	.766	.361	1.622
Age	.028	1.026	1.003	1.050
Troponin	.469	1.000	1.000	1.000
LVEF	.945	.999	.972	1.027
iEDV	.827	1.001	.989	1.014
RWMA	.053	2.440	.987	6.033
LGE	.007	2.782	1.328	5.828
Oedema	.672	.904	.566	1.444

Variable(s): Sex, Age, Troponin, LVEF, iEDV, RWMA, LGE, Oedema.

8 DIAGNOSTIC PERFORMANCE OF ECG DETECTION OF LEFT ATRIAL ENLARGEMENT IN PATIENTS WITH ARTERIAL HYPERTENSION RELATIVE TO THE CARDIAC MAGNETIC RESONANCE GOLD-STANDARD: IMPACT OF OBESITY

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ECG may demonstrate evidence of left atrial enlargement (LAE), which has adverse prognostic implications. We sought to determine the accuracy of 5 ECG criteria of LAE in a hypertensive cohort relative to CMR and to investigate the confounding effect of obesity.

Methods Consecutive referrals for CMR from a tertiary hypertension clinic were reviewed. Patients with any concomitant cardiac pathology were excluded. ECGs were assessed, blinded to CMR data, for: 1) P wave >110ms, 2) P-mitrale (notched P wave with inter-peak duration >40ms), 3) P wave axis <30°, 4) Area of negative P terminal force in lead V1 (NPTF-V1) >40ms•mm and 5) Positive P terminal force in aVL (PPTF-aVL) >0.5mm. Maximal LA volume index (LAVI) was measured by the biplane area-length method.

Abstract 8 Table 1 A) Diagnostic performance of the various ECG parameters at detecting left atrial enlargement; B) Obesity subgroup analysis of diagnostic performance of the various ECG parameters at detecting left atrial enlargement

	Prevalence ECG LAE (%)	ROC-AUC (95th CI)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	ACC (%)
A) Diagnostic performance of the various ECG parameters							
P > 110 ms	9	0.497 (0.384 – 0.610)	9	91	25	74	69
P mitrale	1	0.495 (0.382 – 0.608)	0	99	0	74	73
P axis < 30°	27	0.437 (0.328 – 0.546)	18	70	17	71	56
NPTF-V1 > 40 ms.mm	17	0.465 (0.355 – 0.576)	12	81	18	72	63
PPTF-aVL > 0.5 mm	8	0.502 (0.389 – 0.616)	9	92	27	74	70
Any ECG criteria for LAE	46	0.387 (0.279 – 0.495)	29	48	17	65	43
B) Subgroup analysis by obesity							
P > 110 ms							
Non-obese	10	0.515 (0.352 – 0.679	12	91	33	74	70
Obese	9	0.519 (0.357 – 0.681)	12	92	33	75	72
P mitrale							
Non-obese	2	0.529 (0.364 – 0.695)	0	98	0	74	73
Obese	0	0.500 (0.340 – 0.660)	0	100	0	75	75
P axis < 30°							
Non-obese	21	0.560 (0.395 – 0.725)	29	83	38	76	68
Obese	34	0.467 (0.309 – 0.625)	29	64	22	73	55
NPTF-V1 > 40 ms.mm							
Non-obese	11	0.504 (0.342 – 0.667)	12	89	29	73	68
Obese	21	0.478 (0.320 – 0.636)	18	78	21	74	63
PPTF-aVL > 0.5 mm							
Non-obese	6	0.537 (0.371 – 0.703)	12	96	50	75	73
Obese	10	0.469 (0.314 – 0.625)	6	88	14	73	67
Any ECG criteria for LAE							
Non-obese	41	0.620 (0.462 – 0.778)	59	65	38	81	63
Obese	51	0.475 (0.315 – 0.635)	47	48	24	73	48

(LAE = left atrial enlargement, ROC-AUC = receiver operator curve-area under curve, CI = confidence interval, PPV = positive predictive value, NPV = negative predictive values, ACC = accuracy)

Results 130 patients were included (age: 51.4 ± 15.1 years, 47% male, 51% obese, systolic blood pressure: 171 ± 29 mmHg,

diastolic blood pressure: 97 ± 15 mmHg). The prevalence of LAE by CMR was 26% and by ECG varied from 1% (P-mitrale) to 27% (P axis <30°), and was 46% when ≥1 ECG LAE criteria were present. There was no significant difference in mean LAVI when ≥1 ECG LAE criterion was present compared to when no ECG LAE criteria were present (47 ± 15 vs 50 ± 15 ml/m^2, p = 0.235). All the individual ECG LAE criteria were more specific than sensitive (Table 1/A), with specificities ranging from 70% (P axis <30°) to 99% (P-mitrale). Obesity attenuated the specificity of most of the individual ECG LAE criteria (Table 1/B). Obesity correlated with significant lower specificity (48% vs 65%, p < 0.05) and a trend towards lower sensitivity (59% vs 43%, p = 0.119) when ≥1 ECG criteria of LAE were present.

Conclusion Individual ECG criteria of LAE in hypertension are specific, but not sensitive, for identifying anatomical LAE, relative to CMR. LAE in hypertension should not be excluded on the basis of the ECG, particularly in obese subjects.

9 GLOBAL LONGITUDINAL STRAIN USING FEATURE TRACKING IDENTIFIES THE PRESENCE OF CHRONIC MYOCARDIAL INFARCTION IN PATIENTS WITH NORMAL LV EJECTION FRACTION

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Objectives Chronic myocardial infarction (MI) detected by late gadolinium enhancement (LGE) is associated with significant mortality and morbidity. Limited subendocardial infarction may not lead to reduction in ejection fraction (EF) and a regional wall motion abnormality (RWMA) may not be evident. Global longitudinal strain (GLS) is impaired independently of EF in a number of conditions, enabling early detection of disease. Strain imaging predicts final infarct size in MI and is superior to LVEF in predicting morbidity and mortality. We hypothesised subjects with chronic MI but normal EF would have impaired GLS compared to healthy volunteers.

Methods Twenty patients with chronic MI (defined as subendocardial hyperenhancement on LGE) and normal LVEF and 20 healthy volunteers underwent CMR at either 1.5T or 3.0T (Philips Achieva TX). Standard bSSFP cine images were used to calculate LV dimensions and GLS by feature tracking (CVI 42, Circle Cardiovascular Imaging Calgary, Canada). LGE imaging was performed in all patients (0.2mmol/kg Gadolinium DTPA).

Results Patients were matched for age (59.8 ± 12 vs 59.6 ± 5.4 p = 0.95) and EF (60.4 ± 3.8 vs 62.2 ± 3.5 p = 0.11). Visual evidence of RWMA was present in 13/20 (65%) of chronic MI patients and 0/20 healthy volunteers. GLS was significantly lower in patients with chronic MI than in those without (−16.07 ± 3.9 vs −19.79 ± 2.3 p = 0.001) (Figure 1).

Conclusion GLS is impaired in patients with chronic MI but normal LVEF. GLS identifies abnormalities in LV systolic contraction not apparent with EF alone. It may reveal chronic MI in patients with contraindications to gadolinium-based contrast or prognostication of this subset of chronic MI patients. GLS could be used to detect chronic MI by alternative imaging modalities.

10 QUANTITATIVE MYOCARDIAL PERFUSION AND LONGITUDINAL STRAIN BY FEATURE TRACKING IN NEWLY DIAGNOSED, TREATMENT NAÏVE RHEUMATOID ARTHRITIS

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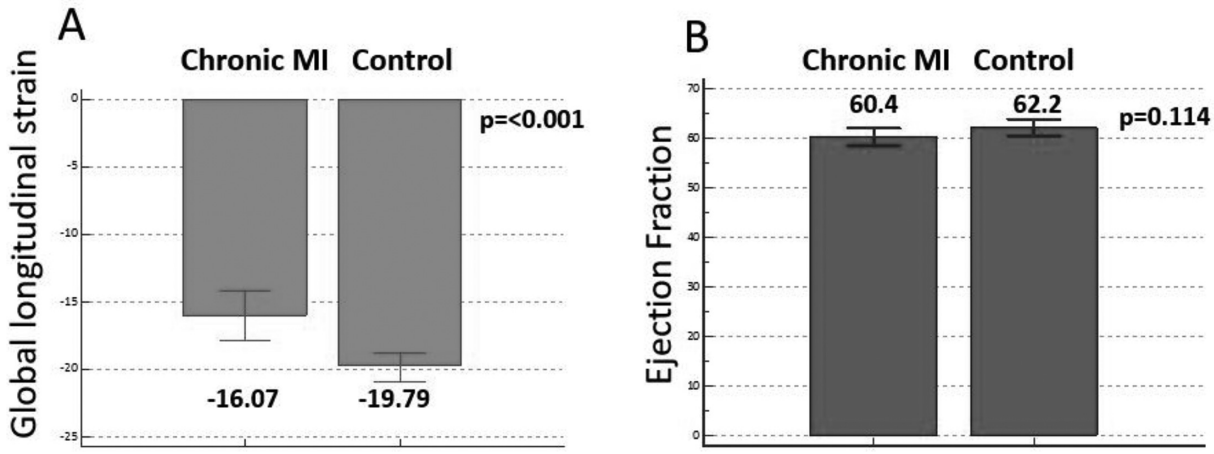
Objectives Rheumatoid arthritis (RA) is associated with increased cardiovascular mortality. Proposed mechanisms include coronary microvascular dysfunction due to immune dysregulation and systemic inflammation.

First pass myocardial perfusion CMR allows quantification of myocardial blood flow (MBF) and myocardial perfusion reserve (MPR). In the absence of coronary artery disease (CAD), reduced MPR represents coronary microvascular dysfunction. We hypothesised MPR would be reduced in RA and that abnormalities in left ventricular (LV) deformation would be evident in RA, as LV mass has been reported to be reduced in established disease.

Methods Twelve patients with newly diagnosed, treatment naïve RA and 12 healthy volunteers (HV) underwent CMR at 3.0T (Phillips Achieva TX). Both groups had no history of CAD. Dual bolus resting and stress perfusion imaging was performed (0.1mmol/kg Gadolinium DTPA) and MBF estimated for the mid ventricular slice using Fermi constrained convolution (PMI v 0.4 [Sourbron, 2009]). Left ventricular ejection fraction (LVEF) and global longitudinal strain (GLS) by feature tracking



Abstract 9 Figure 1 Graphs showing (A) GLS and (B) LVEF in chronic MI vs controls