Imaging

104 A SERVICE REVIEW AND COMPARISON OF RESOURCE UTILISATION WITH THE CHANGE IN RECOMMENDATIONS FROM NICE 2010 CG95 TO THE NICE 2016UPDATE (CHEST PAIN OF RECENT ONSET: ASSESSMENT AND DIAGNOSIS)

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Background NICE 2010 guidelines (CG95) proposed investigation according to pre-test likelihood (PTL) of coronary artery disease (CAD) in patients presenting with stable chest pain; low risk patients are referred for CT coronary angiography (CTCA), intermediate risk should have a functional test (stress echocardiography, MPS, CMR) with invasive angiography reserved for high risk patients and those with a PTL>90% having no investigation and treated prospectively as angina. The 2016 update to CG95 now recommends referral for CTCA in all patients with typical or atypical chest pain and in those with non-anginal pain but with ECG changes, with functional imaging reserved for those who have previously documented coronary disease or revascularisation. Our aim was to compare imaging resource utilisation between the 2010 and 2016 guideline recommendations to highlight the potential service implications if followed explicitly.

Methods Consecutive patients referred over 4 weeks to the Leeds General Infirmary rapid access chest pain clinic (RACPC) with stable chest pain symptoms were prospectively evaluated. Non identifiable data was collected on demographics, typicality of chest pain symptoms and ECG findings and subsequently requested 1st line investigation. Patient notes were reviewed and PTL for patients was calculated in accordance with CG95 and hypothetical investigative strategies calculated according to both 2010 and 2016 guidelines.

Results 157 consecutive patients were evaluated between 17th October and 17th November 2016. Patient demographics are displayed in table 1. 37 (23.5%) patients had typical angina, 55 (35.0%) had atypical angina, 65 (41.4%) had non-anginal symptoms. 16 (10.2%) patients had previous infarction/revascularisation. 25 (15.9%) patients had a PTL<10%, 36 (22.9%) had a PTL of 10%–29%, 30 (19.1%) had a PTL of 30%–60%, 41 (26.1%) had a PTL of 61%–90% and 25 (15.9%) had a PTL of >90%. Table 2 shows diagnostic tests requested and hypothetical investigative strategies according to NICE 2010 CG95 and the 2016 update.

Conclusion/Implications Our results show that if implemented in proposed 2016 form there will be a significant increase in the referral rate for CTCA with a corresponding decrease in referral for functional imaging and angiography. Furthermore the number of patients that are not investigated would more than double following the introduction of the proposed NICE 2016 guidelines. CTCA has high sensitivity for the diagnosis of CAD but more limited specificity and concerns are that increased usage in intermediate/high risk patients may lead to increased rates of unnecessary angiography due to the overestimation of severity of CAD. The change in guidelines would lead to a significant shift in practice that has implications for both workforce planning and provision of resources.

Abstract 104 Table 1 Patient demographics

Patient Characteristics	Number (n=157)
Age/years (mean/SD)	60.4 (13.0)
Male n/%	83 (52.8)
Hypertension n/%	62 (39.5)
Dyslipidaemia n/%	50 (33.8)
Diabetes mellitus n/%	30 (19.1)
Smoking n/%	27 (17.2)
Family History n/%	61 (38.9)
ECG Q-waves n/%	8 (5.0)
ECG ST segment change n/%	8 (5.0)

Abstract 104 Table 2 Investigative strategy according to CG95 guidelines and per clinician request

	Actual investigation requested	2010 recommended investigation	2016 recommended investigation	P-value (difference between 2010 and 2016)
No test	22	25	62	<0.001
CTCA	14	36	79	<0.001
Functional imaging	111	30	16	0.031
X-ray Angiogram	10	41	0	<0.001
Treat as angina	0	25	0	<0.001

105 DIFFERENCES IN MYOCARDIAL MECHANICS BETWEEN ISCHAEMIC AND NON-ISCHAEMIC CARDIOMYOPATHY ASSESSED BY CMR: A SUB-GROUP ANALYSIS OF THE VINDICATE TRIAL

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Background Prognosis and treatment of patients with chronic heart failure (CHF) differs according to whether it is ischaemic (ICM) or non-ischaemic cardiomyopathy (NICM). Multiparametric cardiovascular magnetic resonance (CMR) can distinguish these aetiologies; strain imaging however may confer incremental diagnostic and prognostic information over left ventricular ejection fraction (LVEF). We hypothesised in a prospectively recruited sample of CHF patients, ICM and NICM have different myocardial strain patterns.

Methods The VINDICATE trial investigated efficacy of high dose vitamin D in patients with CHF. A subgroup of the trial underwent CMR, blood and cardiopulmonary exercise tests at baseline. 53 patients (31 ICM, 22 NICM) underwent identical 3.0T CMR protocols (Achieva, Philips Healthcare, Best, The Netherlands). Tissue tagging by spatial modulation of magnetization (SPAMM) (spatial resolution $1.51 \times 1.57 \times 10 mm^3$, tag separation 7 mm, 18 phases, typical TR/TE 5.8/3.5 ms, flip angle 10°, typical temporal resolution 55 ms) was acquired in short axis slices acquired at the apex, mid-ventricle, and base.

Late gadolinium enhancement (LGE) was performed 15 min following administration of 0.15 mmol/kg gadolinium DTPA. CMR data were analysed quantitatively using commercially available software (CVI42, Circle Cardiovascular Imaging Inc. Calgary, Canada and inTag v1.0, CREATIS lab, Lyon, France). Endocardial and epicardial contours were drawn on SPAMM sequences using a semi-automated process. Peak circumferential LV strain (E_{cc}) was measured at apex, mid-ventricle, and base. LV twist was calculated by subtracting basal from apical rotation. Torsion was determined by: Torsion = Peak Twist x (Apical Radius+Basal Radius)/2xApex to Base length

Results The two groups were comparable for baseline demographics (Table 1). The ICM group had significantly more prior revascularisation (CABG/PCI). There was no significant difference between the 2 groups in both LV dimensions and LVEF, however ICM had significantly more LGE (Table 2). There was no significant difference between the 2 groups in E_{cc}. NICM patients had significantly lower LV twist and torsion compared to the ICM group 6.0±3.68° vs 8.8±4.32° p=0.020 and 6.3±3.79° vs 8.8±4.69° p=0.048 respectively.

Conclusion Despite similar EF and E_{cc}, patients with NICM had significantly less LV torsion than ICM. Myocyte dysfunction in ICM is more sub-endocardial due to the wave-front of ischaemia and more global in NICM. Relative perseveration of LV torsion of ICM over NICM is likely a result of sparing of sub-epicardial fibres and an increased compensatory recruitment of sub-epicardial fibres that are predominantly responsible for LV torsion. Recognition of different torsion patterns of ICM and NICM gives insight into aetiology of CHF, which may assist patient diagnosis and management, especially in those unable to have contrast agents.

Abstract 105 Table 1 Demographics

	ICM	NICM	P-value
Age, years	65.2±15.9	59.0±16.9	0.182
Sex (female)%	29	36	0.582
BMI kg/m^2	26.9±3.9	27.6±5.6	0.654
SBP, mmHg	119±21	115±18	0.399
DBP mmHg	70±11	72±11	0.601
Diabetes Mellitus,%	19	4.5	0.195
CABG,%	32	0	0.03
PCI,%	55	0	<0.001
AF,%	65	64	0.949

Abstract 105 Table 2 CMR characteristics

	ICM	NICM	P value
LVEDV, ml	199.4±56.7	226±113.9	0.264
LVEDVi, ml/m^2	104.9±30.5	115.3±48.5	0.343
LVEF,%	35.1±10.6	36.0±11.7	0.767
LV twist, °	8.8±4.32	6.0±3.68	0.023
LV torsion, °	8.8±4.69	6.3±3.79	0.048
E_{cc} Apex	−0.101±0.646	−0.101±0.739	0.689
E_{cc} Mid	−0.103±0.068	−0.107±0.066	0.828
E_{cc} Base	−0.082±0.068	−0.114±0.048	0.064
LGE, n/(%)	21/31 (68%)	3/22 (14%)	<0.001

106 NEW SERVICE: A CARDIAC PHYSIOLOGIST MANAGED EXERCISE STRESS ECHO

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Background National institute for health and clinical excellence (NICE) recommends functional assessment for patients presenting with chest pain of recent origin (CPRO), who have intermediate probability for coronary heart disease (CAD). Exercise stress echocardiography (SE) is a well established, reliable and safe method for assessment of ischaemic heart disease. The exercise stress ECHO service has traditionally been a consultant cardiologist led service (CCSE). But with increasing pressure of demand and to cut waiting times a cardiac physiologist managed exercise stress echocardiography service (CPSE) was started in May 2014 in a district general hospital, as per the British cardiac society protocol 2003. Patients are usually referred from the chest pain clinic. All requests are screened by a consultant cardiologist and test and reporting performed independently by British Society of Echocardiography accredited experienced senior cardiac physiologist, who has also had departmental assessment with direct consultant supervision and review. The team includes 2 physiologist (1st -sonographer, operator and reporter, 2nd assistant (ECG) and cardiac nurse (BP, Contrast)

Methods A retrospective cohort study comparing data collected from Feb 2013 to March 2014 for consultant led (CCSE) and from May 2014–June 2015 for cardiac physiologist led (CPSE) was performed. Patients with positive stress

Abstract 106 Table 1

	Consultant led (n=172)	Cardiac physiologist (n=162)	p value
Males	90	91	0.51
Av age (yrs.)	60	60	
Indications	120	108	0.05
1) Chest pain of recent origin	38	35	1.0
2) assess ischaemic burden	6	9	0.40
3) Shortness of breath	8	10	0.60
4) Other			
Adverse events during test	19	13	0.36
1) ST depression	3	0	0.24
2) Tachycardia	3	8	0.12
3) Bradycardia	2	0	0.49
4) Vasovagal episode	1	1	1.00
5) ST elevation	1	1	1.00
6) Hyper/Hypotension			
Image quality	123	126	0.20
1) Diagnostic, all regions in all views	35	27	0.40
2) Diagnostic, all regions, not in all views	13	9	0.65
3) Non diagnostic, not all regions seen, able to complete test	1	0	
4) Non diagnostic, unable to perform test			