A second opinion was sought if LV function was assessed as <40%. LV function by cardiac MRI was determined by standard semi-automated endocardial contouring at end diastole and end systole using Siemens Syngovia software. The cut off for severe LV dysfunction was <35% and >55% for normal.

Results 12301 TTE and 398 CMR scans were performed in the study period. 120 patients met inclusion criteria with TTE and CMR within 30 days. Reasons for exclusion included missing data (n=2), reversible cause for LV dysfunction (n=1) and poor endocardial definition (n=4) leaving a study population of 113 patients. LVEF by TTE and CMR (figure 1) were strongly correlated ($R=0.85$, $p < 0.001$). Bland Altman analysis demonstrated a signal of systematic bias with LVEF by CMR 4.4% higher than TTE (mean bias 4.4%, 95% CI -0.3 to 9.0, $p = 0.06$). Severe LV function on both TTE and CMR were in accordance in 91% of cases. Normal LV function by TTE and CMR was in accordance in 85% of cases.

Conclusion These results show good correlation of LVEF by TTE and CMR with the latest generation of scanners with a signal of systematic bias where CMR LVEF reads 4.4% higher than TTE. These results are used locally to guide clinical decision making and form part of on-going quality assurance processes. Further work to improve agreement between modalities is required.

Conflict of Interest None

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PREVALENCE OF ECHOCARDIOGRAPHIC ABNORMALITIES IN PATIENTS HOSPITALISED WITH COVID-19

Dennis Chong, Issam Seyala, Muhammad Hamza, Sundes Shah, Khaled Makhoulf, Wai-Chung Wong, Gavin Bridgwood, Bethany Griffith, Diego Maseda. *Mid Cheshire Hospitals NHS Foundation Trust, Crewe, UK*

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Introduction COVID-19 is a multi-systemic disease and cardiac involvement has been widely recognised. Impaired cardiac function is linked to worse prognosis and has important implications on patient management. Evidence-based recommendations to guide selection of COVID-19 patients for transthoracic echocardiogram (TTE) are lacking, and there are concerns regarding unnecessary exposure of sonographers to infection risks.

Purpose 1. To determine the prevalence and nature of abnormal TTE findings in patients who underwent TTE within 6 months of admission to our centre with COVID-19 infection. 2. To determine if specific clinical characteristics were predictors of an abnormal TTE finding.

Methods A retrospective cohort study of all patients admitted to a single hospital with confirmed COVID-19 (through PCR) from 27/03/2020 to 21/06/2020, cross matched with the local TTE database. Data on patient demographics, TTE indication, biochemical markers, selected co-morbidities, ITU admission and mortality were collected. Patients with abnormal TTE were defined by the presence of left ventricular systolic dysfunction (LVSD), right ventricular systolic dysfunction (RVSD), regional wall motion abnormalities (RWMA) or pericardial effusion. Where available, patients with abnormal TTE were compared to previous TTE results to determine if findings

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Clinical characteristic	Abnormal TTE (n=31)	Normal TTE (n=39)	p value
Age	73±9.5	70±14.0	0.201
Sex	58%	45%	0.344
CRP	97±74	117±123	0.419
Lymphocyte count	0.91±0.39	0.84±0.47	0.551
Raised HS-troponin*	79%	44%	0.045
Hypertension	46%	36%	0.466
Diabetes mellitus	30%	37%	0.621
Ischaemic heart disease	30%	13%	0.09
ITU admission	16%	26%	0.383
Mortality	34%	18%	0.18

*Data available for 37 patients

were new. If LVSD was previously present, any worsening in category of severity was considered significant. Unpaired t test and Fisher's exact test were used for between group statistical analysis.

Results We identified 71 (12%) patients who underwent TTE from 597 patients admitted with a diagnosis of COVID-19. The mean age was 71 (42-93) years and 37 (52%) were male. 18 (25%) patients died within the admission and 15 (21%) required ITU care. The most frequent indications for TTE were suspected heart failure (42%), endocarditis (17%), MI (13%), valvular dysfunction (7%) and myopericarditis/effusion (7%). A total of 33 (46%) patients had an abnormal TTE. Of these, 30 (91%) were new findings. LVSD was detected in 26 (37%) cases: 5 (7%) mild, 8 (11%) moderate and 12 (17%) severe. RVSD was detected in 12 (17%), pericardial effusion in 9 (13%) and RWMA in 10 (14%). The only clinical characteristic that predicted an abnormal TTE was raised high sensitivity troponin (table 1). There was a trend towards an abnormal TTE in patients with known ischaemic heart disease (30% Vs 13%, $p = 0.09$). Increased mortality was observed in the abnormal TTE group (34% Vs 18%) although this did not reach statistical significance.

Conclusions There was a high prevalence of significant TTE abnormalities in patients admitted to our hospital with COVID-19 where TTE was clinically indicated. Our cohort had a predominance for LVSD rather than RVSD compared to other studies. Raised high sensitivity troponin level was a predictor of an abnormal TTE and may guide selection of COVID-19 patients for TTE.

Conflict of Interest None to declare

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CARDIAC MAGNETIC RESONANCE IMAGING IN PATIENTS WITH CHEST PAIN, TROPONIN INCREASE AND UNOBSTRUCTED CORONARY ARTERIES; A STUDY OF REAL-WORLD ADHERENCE TO GUIDELINES FROM A LARGE UK DISTRICT GENERAL HOSPITAL DURING THE COVID-19 PANDEMIC

Oluwaseun Olubodun, Shereen Azeez, Karishma Dhera, Harriet Shearman, Andrew Elkington, Sacha Bull. *Royal Berkshire Hospital, UK*

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Background The 2020 ESC Taskforce guidelines made a level I recommendation for the use of cardiac magnetic resonance (CMR) in patients with suspected myocardial infarction with non-obstructive coronary arteries (MINOCA). CMR is a powerful diagnostic tool that can discriminate between myocardial infarction, Takotsubo and myocarditis; myocardial

oedema is best seen when a cardiac MR scan is carried out within 14 days of the initial Troponin positive event and normally subsides after 6 weeks. Access to CMR during the COVID pandemic year was restricted at the height of the pandemic.

Purpose The purpose of this study was three fold. 1. To examine what proportion of patients with a rise and fall in Troponin and unobstructed coronary arteries were offered a CMR scan in our hospital during the year of 2020. 2. To examine the waiting times for a CMR scan during this year 3. To establish in what proportion of patients the CMR scan changed the diagnosis and management of the patients.

Methods This is a retrospective cohort study of all patients that presented to the Royal Berkshire Hospital with chest pain, a troponin rise and unobstructed coronaries on invasive angiogram between January and December of 2020. We collected data on demographics, the degree of troponin rise, echocardiography results, the discharge diagnosis and details of CMR findings (if performed). For quantitative data analysis, the number of days between presentation and CMR imaging was collated, as was the incidence of change of diagnosis and or management.

Results Complete data was available for 104 patients who presented to the Royal Berkshire Hospital with chest pain between 6th January and 21st December 2020. All underwent coronary angiography. Of the patients included, 55.8% (58) were men and 44.2% (46) were women - all between 29 and 89 years of age. 61% of these patients had an ECHO as an inpatient, whilst a further 26% had a Vscan performed. Overall 87% of these patients had a Vscan or ECHO. Of the patients meeting the criteria, 31% of them received an inpatient (16%) or urgent outpatient (84%) CMR, with the average time between presentation and image being 47.3 days. Finally, 59% of diagnosis made on discharge were altered by findings on CMR, with 47% of management plans changed as a result of findings. Final diagnoses, following CMR, can be seen in figure 1. Subgroup analyses were performed on those that displayed initial raised troponins that remained static during admission, and those that received discharge diagnoses of Takotsubo or myocarditis/pericarditis/ myopericarditis.

Conclusions During 2020, the majority of patients (70%) with Troponin rise and unobstructed coronary arteries did not undergo CMR scanning in our hospital. Of the patients offered a CMR scan during the year of 2020, the scan

changed the diagnosis in the majority of patients (59%) but the wait for CMR was considerable (average of 47.3 days). This study suggests that in 2020, in our hospital the majority of patients may have ended up with suboptimal treatment following an admission with chest pain, troponin rise and unobstructed coronary arteries due to reduced access to CMR. This may be, in part, down to the impact of COVID on access to CMRs during the height of the pandemic.

Conflict of Interest Nil

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CT FRACTIONAL FLOW RESERVE: EXPERIENCES FROM A DISTRICT GENERAL HOSPITAL

Hazhee Rasoul, Saad Fyyaz, Daniela Noakes, Carl Shakespeare, Sarojini David, Zeeshan Khawaja, Nikolaos Papamichael, Khaled Al-Fakih. *Lewisham and Greenwich NHS Trust, London, UK*

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Introduction The UK National Institute for Health and Care Excellence recommended CT fractional flow reserve (CTFFR) to assess the functional significance of stenoses found on CT coronary angiogram (CTCA). NHS England subsequently negotiated a UK wide contract with HeartFlow, the provider of CTFFR, in 2018. We describe our experience in a district general hospital.

Method All patients referred for CTFFR following CTCA between 1st January 2019 and 31st March 2020 were analysed. CTCA stenosis severity was categorised as mild (30-50%), moderate (50-70%) and severe (>70% or left main stem >50%). CTFFR <0.8 was deemed positive. Cost analysis was undertaken with the following tariffs: CTCA £220, CTFFR £530, invasive coronary angiogram (ICA) £1000, invasive FFR £336.

Results 140 patients were referred for CTFFR, with 15 (11%) rejected due to image quality (figure 1). 125 were analysed (80 male, mean age 59 yrs). 44 patients had mild stenosis on CTCA, 43 of which had negative CTFFR. 1 patient had positive CTFFR but did not attend follow up. 81 patients had moderate/severe stenosis on CTCA: 36 had positive CTFFR: 6 were medically managed, 29 underwent ICA, with 22 (76%) revascularised. 4 patients had false positive CTFFR and were medically managed after ICA. 6 had false negative CTFFR in one vessel, 5 of which had true positive and one had false positive in a different vessel. 45 had negative CTFFR: 18 were medically managed, 14 underwent ICA. 4 (29%) were revascularised, with 3 noted to have calcium scores ranging 622-1108. Cost per patient in our cohort was £1166.51. If only patients with CTCA stenosis >50% underwent CTFFR the cost was £971.95.

Conclusion CTFFR can be an effective gatekeeper to ICA with revascularisation rates of 76% in CTFFR <0.8 versus 29% with CTFFR >0.8. However, a high calcium score may influence CTFFR accuracy and further investigation is warranted in these patients. The use of CTFFR with mild CTCA stenosis did not influence management, with significant cost savings of £194.56 per patient had they not been referred for CTFFR.

Conflict of Interest None declared

CMR Diagnoses January - December 2020

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