7 SEX DIFFERENCES IN LATE CHEMOTHERAPY-INDUCED CARDIOMYOPATHY IN ADULT CANCER SURVIVORS: A CARDIOVASCULAR MAGNETIC RESONANCE STUDY

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Introduction Chemotherapy induced cardiomyopathy (CIC) carries significant morbidity and mortality in cancer survivors. Female sex is a recognised risk factor for CIC in paediatric populations but the effect of sex in adult patients has not been established. We investigated sex differences in CIC using cardiovascular magnetic resonance (CMR).

Method 76 patients without abnormal left ventricular function prior to chemotherapy (30 male [59±15 years], and 46 female [58±13 years, p=0.86]) were included. Cumulative anthracycline dose (193±165 vs. 189±119 mg/m^2, p=0.91) and follow-up interval (8.75±8.75 years vs. 8.75±9 years, p=0.99) were similar. All patients underwent contrast-enhanced CMR at 1.5T, including long and short axis cine imaging, mitral and tricuspid annular peak systolic excursion (MAPSE and TAPSE, respectively), and late gadolinium enhancement (LGE). Multivariate regression analysis was undertaken.

Results Left (39±13 vs 46±10%; p=0.027) and right ventricular ejection fraction (50±10 vs. 55±8%; p=0.042) were significantly lower in males, largely driven by differences in LV (208±83 vs. 167±42, p=0.02) and RV end diastolic volume (150±44 vs. 120±31, p=0.002). MAPSE and LAVi correlated significantly with LVEF (p<0.001 in both cases), as did TAPSE with RVEF (p=0.02). LGE prevalence did not differ between males and females (37% vs. 20%, respectively, p=0.10).

Conclusions Adult male cancer survivors developed comparably worse late biventricular CIC than their female counterparts despite receiving similar doses of cancer treatment. These findings need confirmation in larger cohort studies, and if confirmed, could inform bespoke monitoring strategies taking sex differences into account.

8 A MODEL FOR LOW CONTRAST VOLUME CTCA

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Background Recently published NICE guidance has outlined an increasing role for CT coronary angiogram (CTCA) in the assessment of patients with chest pain. This is likely to result in an exponential increase in the number of CTCAs. We report a model for undertaking CTCA with low contrast dose providing excellent image quality and correlation with invasive coronary angiography.

Method Over 800 CTCAs have been undertaken at our centre in the last year. We have refined our protocol to deliver an average contrast volume of 30mL (range 22–38 mL), providing excellent image quality and invasive angiographic correlation, using: 1. Prospective ECG-gating for all acquisitions, with software based motion correction where necessary. 2. Smart monitoring protocol for image acquisition. 3.4–6 sec contrast bolus injection at 4.5–6.5 mL/sec injection.

Results 200 consecutive scans were acquired for a range of indications, using 22–38 mL iodine based contrast (Omnipaque 350). Contrast was injected for 4–6 seconds, at 4.5–6.5 mL/sec based on BMI, calcium score, previous coronary stents or coronary artery bypass grafts. 40% patients subsequently underwent invasive coronary angiography +/- pressure wire studies for functional assessment and percutaneous intervention. Image quality and invasive angiographic correlation was excellent (>98% anatomical correlation).

Conclusion Using our model excellent image quality and accuracy comparable to conventional coronary angiography can be achieved, using low contrast volume. Our protocol can be used in patients with impaired renal function and provides limited cost saving compared to conventional protocols.

9 ASSESSMENT OF AORTIC VALVE CALCIFICATION USING CONTRAST-ENHANCED COMPUTED TOMOGRAPHY

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Introduction Aortic valve calcification (AVC) has been proposed as the main force driving progression of aortic stenosis. Non-contrast computed tomography (CT) can reproducibly quantify AVC and correlates well with echocardiographic measures of severity. However, contrast-enhanced CT presents the opportunity to quantify AVC whilst also providing important information about spatial distribution of calcium and non-calcific thickening of leaflets.

Methods CT scans of 113 consecutive patients assessed for transcatheter aortic valve implantation (TAVI) at the Edinburgh Royal Infirmary were analysed. Contrast-enhanced CT images were reconstructed in the short-axis plane of the aortic valve to measure valve dimensions, quantify AVC (volume, mm^3) and document spatial distribution of calcium. Three methods were compared for defining the radiodensity threshold above which calcium was detected and a scoring system was applied to describe calcium distribution.

Results AVC can be detected using contrast-enhanced CT and is likely to benefit from a threshold adjusted according to contrast load. Males were found to have higher AVC volume than females (mean 1069mm^3 vs. 817.7 mm^3, p=0.0058), even when adjusted for annular diameter (p=0.0435). The non-coronary cusp was the most heavily calcified cusp (p<0.001) and a correlation was seen between increasing cusp calcification and progressive involvement of the free edge tending toward a complete arc of calcium.

Conclusions Contrast-enhanced CT allows for quantification of AVC and the optimal method must now be validated against non-contrast CT. Contrast CT provides valuable additional information about valve anatomy and AVC location which are likely to contribute to the haemodynamic severity of aortic stenosis.