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The clinical value of CMR in the management of Cardio-Oncology patients - a tertiary centre experience

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Background: There is increasing awareness of cardiotoxicity arising from cancer treatments. Early diagnosis and treatment is key, to ensure patients receive optimal oncological management. Cardiovascular magnetic resonance (CMR) offers gold standard measurement of cardiac function, alongside tissue characterisation and myocardial perfusion, thereby potentially providing additive value in the context of cardio-oncology.
Purpose: We sought to understand the clinical value of CMR in cardio-oncology at a tertiary cardio-oncology centre.
Methods: We retrospectively reviewed CMR scans requested in cardio-oncology patients at our institution within a ten-month period. We categorised clinical indications and assessed the impact on clinical management using previously-published criteria.
Results: 102 CMR studies were requested in 93 cardio-oncology patients (mean age 56 (range 18 to 82), 49% male) between (March to December 2018). 41% of patients had haematological malignancies, 59% solid tumours.
15% of requests were for risk stratification prior to initiation of cancer therapy, 21% for screening for cardio-toxicity in patients currently receiving cardiotoxic agents (3% anthracyclines, 13% HER2 monoclonal antibodies, 4% fluoropyrimidines), 15% for investigation of patients with cardiac complications during cancer treatment, 35% assessment for late effects post cancer treatment, and 14% for cardiac malignancies/ infiltration.
The most common indications for CMR were monitoring of left ventricular ejection fraction (LVEF) in patients where quantification by echocardiography was non-diagnostic or significantly different between imaging studies (39%) and ischaemia assessment including for patients due to receive fluoropyrimidines (26%). Others were aetiology of LV dysfunction/cardiomyopathy (13%) and tissue characterisation (23%), including assessment for cardiac AL amyloid (11 patients), myocarditis (2), cardiac metastases (1), cardiac masses (6), and cardiac iron loading (1).
CMR findings had clinical impact in 61% of patients and assisted in adjudicating a new diagnosis in 29% of patients. 88% of patients were able to continue anthracycline/anti-HER2 therapies based on CMR findings of stable LVEF (93% of whose echocardiograms had suggested reductions). LVEF had reduced significantly in 12% of patients meaning chemotherapy was held/discontinued. 3 patients were recommended to receive non-fluoropyrimidine chemotherapy based on perfusion CMR (pCMR) findings, with one patient permitted to receive capecitabine following normal pCMR.
Conclusion: CMR provides a comprehensive assessment of myocardial structure and function with utility within the context of cardio-oncology for risk stratification pre-chemotherapy, screening for cardiotoxicity during treatment and investigation of cardiac complications of cancer treatment. The additional information derived from CMR generally provides reassurance enabling administration of optimal cancer therapies.