Routine use of global longitudinal strain for early identification of subclinical left ventricular dysfunction among cancer patients

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Background: Cardiac toxicity from cancer therapy has become a leading cause of morbidity and mortality in survivors, reaching mortality rate as high as 60% in two years. The most commonly used definition is a reduction in left ventricular ejection fraction (LVEF). However, according to recent American and European Expert Consensus, global longitudinal strain (GLS) is the optimal parameter for early detection of subclinical LV dysfunction.

Objectives: Evaluate the frequency of GLS reduction (≥10% relative reduction) in cancer patients, its correlation to LVEF reduction and if there are other predicting echocardiographic parameters.

Methods: The data was collected as part of the International Cardio-Oncology Registry (ICOR). ICOR is a prospective registry enrolling all patients evaluated in the cardio-oncology clinic at the Tel Aviv Sourasky Medical Center.
All patients performed at least two echocardiography exams, including GLS. All exams were performed with the same vendor, technician and interpreting cardiologist. Excluded were patients with reduced LV function (EF<55%) at baseline.

**Results:** Among 64 consecutive patients, 24 patients (37%) had reduced baseline GLS (<-19%). GLS reduction was observed among 12 patients (19%), of which 75% had no concomitant EF reduction. There were no significant differences in baseline cardiac risk factors (Hypertension, Diabetes, Dyslipidemia or smoking). Treatment with Doxorubicin, Pertuzumab and Ifosfamide was significantly correlated to reduced GLS (p=0.015, 0.039 and 0.003, respectively). However, Trastuzumab treatment and chest radiation was not. No other echocardiography parameters, including diastolic function, right ventricular function or systolic pulmonary artery pressure were significant predictors for GLS reduction.

**Conclusions:** GLS reduction is frequent among cancer patients and precedes the LVEF reduction and cannot be anticipated by other echocardiography parameters. Using GLS routinely during cancer treatment may lead to an early cardio protective treatment and prevention of irreversible LVEF reduction and heart failure, as well as preventing discontinuance of life saving treatment for cancer.