GLOBAL LONGITUDINAL STRAIN BECOMES IMPAIRED IN CHEMOTHERAPY TREATED BREAST CANCER PATIENTS

Poster Contributions
Hall C
Sunday, March 30, 2014, 9:45 a.m.-10:30 a.m.

Session Title: Non Invasive Imaging: Left Ventricular Myocardial Strain Imaging-Clinical Applications
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Background: Chemotherapy agents commonly used in the treatment of breast cancer are associated with unique and varying degrees of myocardial injury, often measured as declines in left ventricular ejection fraction (LVEF). However, LVEF assessments have limitations for detecting chemotherapy-related cardiac dysfunction. Global longitudinal strain (GLS) has demonstrated potential for identifying early chemotherapy-related myocardial injury.

Methods: We identified breast cancer patients treated with any type of chemotherapy at Duke University Medical Center (DUMC) from 2005-2010. We narrowed the cohort further to those patients who underwent a baseline echocardiogram pre-chemotherapy and a follow-up echocardiogram within 1 year after completing chemotherapy. Myocardial strain was retrospectively assessed in the three apical projections and GLS calculated.

Results: There were 155 breast cancer patients who received chemotherapy at DUMC from 2005-2010 and had pre- and post-chemotherapy echocardiograms. Pre- and post-chemotherapy echocardiographic images were adequate for 2-dimensional speckle-tracking longitudinal strain analyses in 143 patients. Mean change in GLS from pre- to post-chemotherapy assessment was 1.2% ± 3.4% (p <0.001). On average, patients experienced a numerical 0.24% (95% CI = -0.02, 0.51; p =0.075) increase in GLS per month post-chemotherapy. Of 155 patients with baseline and follow up LVEF, 6 (4%) had an interval LVEF decline below the lower limit of normal (LLN) (i.e., LVEF <55%). In contrast, 31 (22%) patients had GLS that worsened below -16%, the LLN for GLS.

Conclusions: Breast cancer chemotherapy is associated with worsened longitudinal myocardial strain during the first year after chemotherapy. GLS identified more patients with impaired myocardial systolic performance than LVEF. The clinical implications of the observed differences between GLS and LVEF require further study.