

## Right Ventricular Dynamics During Breast Cancer Chemotherapy in Low Cardiovascular Risk Patients

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**Abstract :** Introduction/Purpose Chemotherapy is a common treatment for breast cancer, but it can also cause damage to the heart and blood vessels. This damage, known as cancer therapy-related cardiovascular toxicity (CTR-CVT), can increase the risk of heart failure and death in breast cancer patients. The left ventricle is often affected by CTR-CVT, but the right ventricle (RV) may also be vulnerable to CTR-CVT and may show signs of dysfunction before the left ventricle. The study aims to investigate how the RV function changes during chemotherapy for breast cancer by using conventional echocardiographic and global longitudinal strain (GLS) techniques. By measuring the GLS strain of the RV, researchers tend to detect early signs of CTR-CVT and improve the management of breast cancer patients. Methods The study was conducted on 28 women with low cardiovascular risk who received anthracycline chemotherapy for breast cancer. Conventional 2D echocardiography (LVEF, RVS', TAPSE) and speckle-tracking echocardiography (STE) measurements of the left and right ventricles (LVGLS, RVGLS) were used to assess cardiac function before and after chemotherapy. All patients had normal LVEF at the beginning of the study. Cardiotoxicity was defined as a new LVEF reduction of 10 percentage points to an LVEF of 40-49% and/or a new decline in GLS of 15% from baseline, as proposed by the most recent cardio-oncology guideline. ResultsThe research found that the LVGLS decreased from  $-21.2\% \pm 2.1\%$  to  $-18.6\% \pm 2.6\%$  (t-test = -4.116; df = 54, p=0.001). The change in value  $\Delta$ LV-GLS was  $2.6\% \pm 3.0\%$ . The mean percentage change of the LVGLS was  $11.6\% \pm 13.3\%$ ; p=0.001. Similarly, the right ventricular global longitudinal strain (RVGLS) decreased from  $-25.2\% \pm 2.9\%$  to  $-21.4\% \pm 4.4\%$  (t-test = -3.82; df = 54, p=0.001). The RV-GLS value of change was  $3.8\% \pm 3.6\%$ . Likewise, the percentage decrease of the RVGLS was  $15.0\% \pm 14.3\%$ , p=0.001. However, the measurements of the right ventricular systolic function (RVS) and tricuspid annular plane systolic excursion (TAPSE) were insignificant, and the left ventricular ejection fraction (LVEF) remained unchanged.

**Keywords :** cardiotoxicity, chemotherapy, GLS, right ventricle

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