Echocardiographic changes during transtuzumab based therapy in Hispanic women with HER-2 neu expressing breast cancer.

Background:

Breast cancer is a heterogeneous disease. Up to 20% of these cancers over express HER-2. HER-2 is a member of transmembrane Erb B family of growth factor receptors. Her 2+ tumors are highly proliferative and have increased capacity to invade and disseminate. Prognosis of patients with Her 2 + cancers has improved due to the inclusion of anti-HER2 antibodies in their treatment regiments. Amongst the available agents, transtuzumab is most commonly used.

HER-2 signaling is crucial for cardiac development during embryogenesis and for cardiac adaptation to stress. Hence cardiotoxicity is the main concern during treatment with anti-HER2 agents. In well selected patients who participated in initial clinical trials, the incidence of left ventricular ejection fraction (LVEF) decline after 1 year of adjuvant transtuzumab was 4.1%. The incidence of clinical congestive heart failure was 0.8% (1).

The Garber Breast Care center at TTUHSC-EP serves a predominantly Hispanic population with a high prevalence of obesity, dyslipidemia, type II diabetes mellitus and hypertension. Due to these pre-existing comorbidities, these women may be at a higher risk of cardiac complications during transtuzumab based treatment. Recent studies also suggest that obesity may be independent predictor of cardiotoxicity during transtuzumab based therapy. (2)

Aim:

The aim of the study will be to assess the echocardiographic changes during transtuzumab based adjuvant therapy in patients with HER 2 expressing breast cancers.

Methods:

All patients diagnosed with early stage (stage 1, 2 and 3) HER 2 expressing breast cancer from Jan 1st 2010 to Jan 1st 2015 will be identified using the tumor registry. Of these patients ones who have undergone adjuvant or neoadjuvant transtuzumab based therapy will be the subjects of the study. Following patient related information will be collected: age, race, body mass index (BMI), presence or absence of type II diabetes mellitus and HBA1C level, hypertension, dyslipidemia, prior diagnosis of coronary disease or congestive heart failure, use of angiotensin enzyme inhibitors or beta blocker. Following tumor related features will be collected: size, nodal status, ER status, HER 2 status (IHC and/or FISH), location (left or right), and use of adjuvant radiotherapy. Chemotherapy regimen used will be identified.

Echocardiograms obtained on these patients before initiation and after completion of transtuzumab will be reviewed. Following echocardiographic parameters will be evaluated: left ventricular ejection fraction, global longitudinal strain, tissue doppler and pulse wave doppler evaluation for diastolic

dysfunction, right ventricular tricuspid annular plain systolic excursion, right ventricular fractional area change and pulmonary artery systolic pressure. Paired t-test will be used to evaluate the data. Hospitalization rate for cardiac complications during and for 2 years after completion of all cancer therapy will be recorded.

References:

1. Cameron D et al. 11 years follow up of ranstuzumab after adjuvant ceotherapy in HER2-positive early breast cancer: final analysis of the HERceptin Adjuvant (HERA) trial. Lancet 2017;389:1195-1205
2. Guenancia C el al. Obesity as a risk factor for anthracycline and transtuzumab cardiotoxicity in breast cancer: A systemic review and meta-analysis. J Clin Oncol 2016; 34: 3157-3165