

Echocardiographic cardiotoxicity screening for breast cancer patients treated with Trastuzumab in a tertiary hospital: the need for developing a comprehensive cardio-oncology programme

Priest, G., Ntoskas, T. and Hothi, S. S.
New Cross Hospital, Wolverhampton, England.

Introduction

The cardiotoxic properties of Trastuzumab is well documented. The American Society of Echocardiography and the European Society of Cardiovascular Imaging recommend echocardiography as the imaging method of choice for monitoring patients receiving Trastuzumab for HER2 positive breast cancer. Despite the wealth of evidence, our department currently does not have a dedicated cardio-oncology clinic or echo service. The concern here is echocardiography is not being used to its full potential, utilising 3D left ventricular ejection fraction, strain imaging and contrast enhanced echo where indicated, in line with current guidelines.

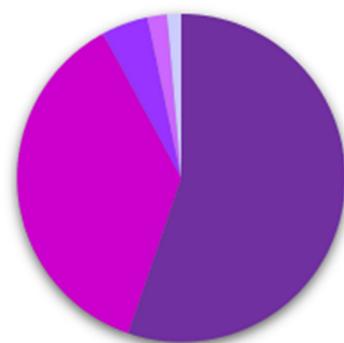
Aim

To address the challenges that arise through not having a dedicated service we retrospectively reviewed the echo data of 134 patients who have or had received treatment for breast cancer expressing the HER2 receptor. We would go on to evaluate our current practice and formulate a robust cardio-oncology service.

Results

In total, 961 echos had been performed for the 134 patients from January to December 2018 in our centre (New Cross Hospital, Wolverhampton, UK). All had received baseline echos and follow-up echos according to guidelines. We reviewed the number of scans each patient had received, baseline and latest LV dimensions and ejection fraction, whether the EF was quantitatively or qualitatively derived and the incidence of strain and 3D EF assessment. Also recorded was the use of echo contrast and the number of scans where there was an indication for the use of contrast, but contrast not applied without good reason. We revealed a large heterogeneity of operators, with an average of greater than 5 echocardiographers with varying levels of experience per patient. Across all studies, the uptake of 3D and strain assessments, and echo contrast where indicated, was low, despite the availability of equipment (3D=2.1%, strain= 5%, contrast= 1.5%). There were large variations in the use of quantitative and qualitative EF assessment across all studies, and for the same patients assessed serially.

Visual Representation of Echo Modality use across 961 echos



■ Biplane EF 60% ■ Visual EF 40% ■ Strain 5% ■ 3D 2.1% ■ Contrast 1.5%

Discussion

The large variations in delivery of echocardiography shown in our service evaluation have highlighted the need to develop a targeted service for this cohort of patients. The ASE and EACVI guidance both state that there is a need for dedicated sonographers to reduce intra-operative variability and quantification of LVEF by Simpsons' Bi-plane, 3D LVEF assessment and strain. Contrast is indicated when two or more adjacent segments cannot be seen clearly. We urgently need to implement changes to our current practice to implement the guidance.

We are currently in the process of building a cardio-oncology clinic. Dedicated echo clinics will be necessary to ensure that specialist echocardiographers perform the test, who are trained in advanced echo techniques. We have echo machines with the capabilities of these techniques. At our centre, some of our senior cardiac physiologists are trained in cannulation and IV drug administration and there is therefore the potential for physiologists to administer pre-prescribed contrast without a doctor's clinic presence. This should help us to increase its use according to the recommendations of the ASE and EACVI. The hope for the future is to have a dedicated service, improving the diagnostic quality of echocardiography within our service, and to enhance integration between the cardiology and oncology fields to address alterations in cardiac function as soon as possible.

Conclusion

Currently there is great disparity in the level of service being offered to Wolverhampton patients being treated with Trastuzumab. Our research has identified the areas most in need of improvement, including reducing operator numbers, using advanced echo modalities and administering contrast. The hope is these strategies, with a joint collaboration between cardiology and oncology, will standardise care so it meets the expectations of our patients.

References:

- Chavaz-MacGregor et al. (2015). Cardiac monitoring during adjuvant trastuzumab-based chemotherapy among older patients with breast cancer, *JCO*, 33: 2176-2183.
- Nowsheen et al. (2018). Trastuzumab in female breast cancer patients with reduced left ventricular ejection fraction, *JAHA*, 7: 1-12.
- Plana et al. (2014). Expert consensus for multimodal imaging evaluation of adult patients during and after cancer therapy: a report from the ASE : and EACVI, *JASE*, 27: 911-939.

Variation in Operators for 134 Patients

