

A Restrospective Analysis of the Association of Obesity with Anthracycline and Trastuzumab Induced Cardiotoxicity in the Treatment of Cancer

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A Restrospective Analysis of the Association of Obesity with Anthracycline and Trastuzumab Induced Cardiotoxicity in the Treatment of Cancer

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BACKGROUND / INTRODUCTION

- Anthracycline (AC) and Trastuzumab (Tra) have been shown to cause significant cardiotoxicity (CT)
- AC induced CT has been cited as high as 26% when higher cumulative doses were used (6)
- CT is about 3% to 7% with Tra (7)
- CT is defined as patient with documented diagnoses of heart failure on the chart, decrease in LVEF either >15% from baseline or LVEF<50%, or documented acute coronary syndrome after AC or Tra based chemotherapy was initiated
- Doses of AC are calculated based on body surface area (BSA) and for Tra based on body weight
 - Obese patients receive a higher cumulative dose of chemotherapy
- Obesity is inconsistently listed as a risk factor for CT
- We wanted to confirm if there was a link between obesity and CT from AC and/or Tra

METHODS

- Retrospective analysis of all patients who have received AC and/or Tra as part of their chemotherapy treatment between 2008 and 2012
- All of the information was collected from MOSAIQ, EPIC, and Centricity
- Data collected includes:
 - cancer type, chemotherapy type, dose and duration
 - Age, gender, height, weight, BMI, BSA
 - Creatinine clearance, hemoglobin, albumin, lipids, blood pressure, glucose level
 - Hospital or outpatient evaluations for congestive heart failure or shortness of breath, such as, echo, MUGA, BNP, NT-proBNP, troponin, stress testing, and cardiac catheterization
 - Past heart problems

OUTCOMES

Table 1. Study Sample Characteristics (N=335)

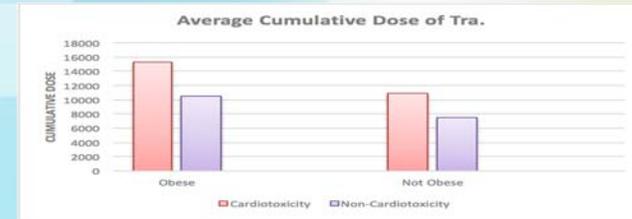
Variable	Total	Cardiotox (N=28)	Non-cardiotox (N=307)
Age (Years, mean ± SD)	53.8 ± 13.2	54.0 ± 13.4	53.5 ± 13.3
Gender (N, %)			
Female	278, 83.0%	22, 78.6%	256, 83.4%
Male	57, 17.0%	6, 21.4%	51, 16.6%
Race (N, %)			
White or Caucasian	258, 77.0%	20, 76.9%	238, 79.6%
Black or African American	20, 5.9%	2, 7.7%	18, 6.0%
Asian/Pacific Islander	10, 3.0%	0, 0%	10, 3.34%
Other	37, 11.0%	4, 15.4%	33, 10.7%
Body Mass Index (Kg/m ² , mean ± SD)	29.7 ± 7.2	29.1 ± 5.8	29.7 ± 7.2
Body Surface Area (M ² , mean ± SD)	1.85 ± 0.22	1.84 ± 0.21	1.85 ± 0.22
Height (Inches, mean ± SD)	64.6 ± 3.5	64.6 ± 13.4	64.5 ± 3.5
Weight (Pounds, mean ± SD)	176 ± 44.1	172 ± 37.5	175 ± 44.1
Obesity (BMI> 30, N, %)	137, 40.9%	14, 50.0%	123, 40.1%
Systolic (mmHg, mean ± SD)	124 ± 18.4	124 ± 18.5	124 ± 18.5
Diastolic (mmHg, mean ± SD)	72.5 ± 10.3	72.5 ± 10.2	72.6 ± 10.3
Type of Cancer (N, %)			
Left Breast	111, 33.1%	3, 10.7%	108, 35.2%
Right Breast	102, 30.4%	11, 39.3%	91, 29.6%
Both Breasts	15, 4.5%	2, 7.1%	13, 4.2%
Lymphoma	107, 31.9%	12, 42.9%	95, 30.9%
Stage (N, %)			
1	60, 18.9%	2, 7.7%	58, 20.0%
2	134, 42.3%	9, 34.6%	125, 43.1%
3	59, 18.6%	7, 26.9%	52, 17.9%
4	62, 53.0%	8, 30.8%	54, 18.6%
Chemotherapy (N, %)			
Antra.	215, 64.1%	22, 78.6%	192, 62.5%
Trast.	97, 28.9%	4, 14.3%	93, 30.3%
Both	23, 6.9%	2, 7.1%	22, 7.2%
Chemo Cumulative Dose (Mg/m ² , mean ± SD)			
Antra.	461 ± 127	497 ± 139	452 ± 124
Trast.	6,923 ± 5,778	10,515 ± 6,874	8,608 ± 4,773
Radiation to the thorax (N, %)	127, 37.9%	14, 50.0%	173, 56.3%
Cardiac Cath (N, %)	20, 5.9%	11, 39.3%	10, 3.2%
Hypertension (N, %)	113, 33.7%	16, 57.1%	97, 31.6%
Diabetes (N, %)	43, 12.8%	5, 17.9%	56, 18.2%

SD= Standard Deviation

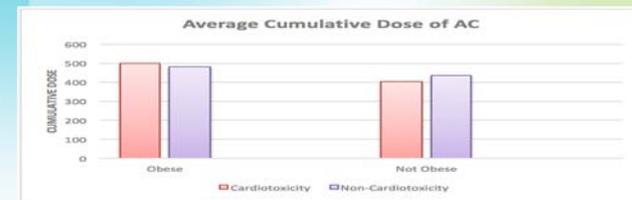
- Out of the 215 people that received AC 10.2% got CT
- Out of 97 people that received Tra 4.1% got CT
- Out of 23 people who received both AC and Tra 8.7% got CT

RESULTS

Graph 1. Comparison of Dose of AC. Vs. Cardiotoxicity and Obesity



Graph 2. Comparison of Dose of Tra Vs. Cardiotoxicity and Obesity



DISCUSSION

- Age range of patients who acquired CT is 27- 79
- In the cohort without CT only 40% were obese but within the group that developed CT 50% were obese
- Obese patients that developed CT got an average cumulative dose of 498 mg of AC or an average cumulative dose of 15,240 mg of Tra compared to the obese non-CT patients who received an average cumulative dose of 479 mg of AC or 10,434 mg of Tra
- Within the group of patients who had CT there was a high percent of patients with hypertension and/or diabetes

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2. Seidman A, Hudis C, Pierri MK, et al. Cardiac dysfunction in the trastuzumab clinical trials experience. *J Clin Oncol.* 2002; 20: 1215-21.

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