Understanding the prevalence and management of anthracycline induced heart failure in haematology patients

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Background

- Anthracyclines are cardiotoxic anticancer agents, the use of which may result in heart failure (HF).
- The European Society of Cardiology (ESC) recommends that patients' left ventricular ejection fraction (LVEF) should be assessed before receiving anthracycline-based chemotherapy, and again after a year of completing any chemotherapy containing 300mg/m^2 of doxorubicin or an equivalent dose of another anthracycline[1].
- The percentage of patients developing HF post anthracycline chemotherapy is as yet undetermined at Sunderland Royal Hospital (SRH) and current practice of monitoring patients receiving anthracyclines for haematological malignancies has not been quantified.

Objective

- This audit aimed to understand the current practice in SRH adult haematology patients receiving anthracyclines and determine the proportion who subsequently develop HF.
- The data will be used to assess the need for a haematology-cardiology service, whereby, joint care can take place if required.

Methodology

- The hospital's electronic prescribing system was used to compile a list of adult haematology patients who started and completed anthracycline-based chemotherapy between January 2017 and December 2019.
- Patients' records were used to determine:
  - ❖ demographics
  - ❖ history of cardiac diseases or risk factors for cardiac diseases (hypertension, hyperlipidaemia and diabetes)
  - ❖ details of anthracycline received
  - ❖ echocardiogram results
  - ❖ whether patients developed HF

Key findings

1. Patients' characteristics

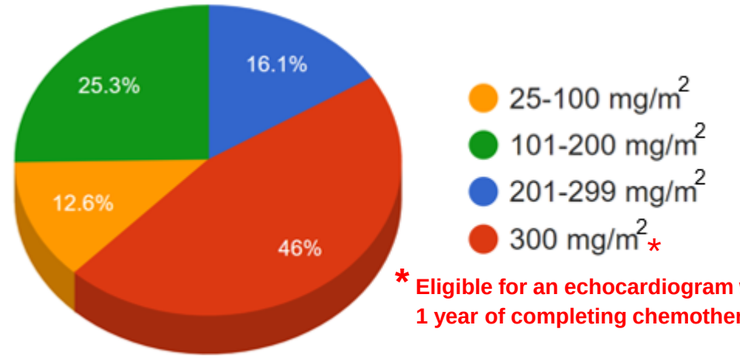
Characteristic	
Total number of patients	87
Male No. (%)	50 (57.5)
Ave. Age years (Range)	59.5 (20-85)
No. of patients with known cardiovascular disease; No. (%)	13 (14.9)
No. of patients with at least 1 cardiovascular risk factor; No. (%)	42 (48.3)
Ave. times to audit review patients after completing chemotherapy; months (range)	24.9 (12-45)

Table 1: Summary of patients' characteristics

Cardiovascular history	Number of patients (%)
Cardiovascular diseases	
Atrial fibrillation	7 (8.0)
Angina	3 (3.4)
Myocardial infarction	1 (1.1)
Moderate to severe mitral regurgitation	2 (2.3)
Previous stent	2 (2.3)
Severely dilated right ventricle with reduced function	1 (1.1)
Cardiovascular risk factors	
Hypertension	34 (39.1)
Hyperlipidaemia	15 (17.2)
Diabetes	13 (14.9)

2. Anthracycline (doxorubicin) treatment

Doxorubicin was the only anthracycline received by all patients



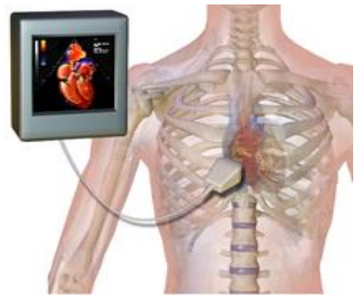
* **Eligible for an echocardiogram within 1 year of completing chemotherapy**

Figure 1: Doxorubicin total dose ranges and percentage of patients who received them

3. Echocardiogram monitoring

Time of receiving echocardiogram	Percentage of patients
Pre-treatment	92
Post-treatment	37.9
Within 1 year of receiving 300mg/m^2 doxorubicin dose	37.5

Table 2: Percentage of patients who received echocardiogram



4. Heart failure cases

2
patients developed heart failure

- 2.3% of patients developed HF within the audit review time frames.
- Both received a total doxorubicin dose of 300mg/m^2.
- The data is insufficient to support resourcing a combined haematology-cardiology service.

Summary and recommendations

2 patients out of 87 (2.3%) developed heart failure

Currently insufficient data to support a combined haematology-cardiology service

Steps should be made to ensure all patients receive a pre-treatment echocardiogram and with 1 year of receiving 300mg/m^2 doxorubicin

Future audits should include all potentially cardiotoxic chemotherapy agents

Re- audit of this patient cohort is recommended to extend the post chemotherapy time frame

Reference

1. Zamorano J, Lancellotti P, Rodriguez Muñoz D, Aboyans V, Asteggiano R, Galderisi M et al. 2016 ESC Position Paper on cancer treatments and cardiovascular toxicity developed under the auspices of the ESC Committee for Practice Guidelines. European Heart Journal. 2016;37(36):2768-2801.