

## **Anthracycline-Induced Cardiomyopathy: Outcomes of Children with Moderately Depressed Ejection Fraction**

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**Background:** Anthracyclines are an important chemotherapeutic agent, but results in cardiotoxicity and may lead to cardiomyopathy (ACM) and heart failure (HF). This study aimed to review clinical outcomes of patients with an EF less than 45%.

**Methods:** Single center, retrospective review of 672 patients who received anthracyclines from 1/08 to 12/14. Cardiac dysfunction was defined by a left ventricular end-diastolic dimension z-score  $\geq 2$  and/or a left ventricular ejection fraction (EF)  $\leq 50\%$ . Patient demographics, cancer etiology, total anthracycline dosage, thoracic radiation, echocardiographic data, and outcomes were recorded.

**Results:** There were 200 patients with ACM and 44/200 (22.0%) had an EF  $\leq 45\%$  (range 14-45%) at any point in time. For this subset, the mean age at oncology diagnosis was  $13 \pm 5$  years (range 2-23 years). Mean cumulative anthracycline dose was  $260 \pm 112$  mg/m<sup>2</sup> (49.6 to 492 mg/m<sup>2</sup>). Oncological diagnosis was classified as solid tumor (30%) vs. leukemia/lymphoma (70%). Thirteen patients (29.5%) received thoracic radiation exposure. Overall mortality was 45%, but rarely related to HF (10 deaths from cancer, 9 from sepsis, and 1 from HF). Notably, 1 patient had a history of cardiac arrest, 1 required VA ECMO due to sepsis, and 1 other patient required Left ventricular assist device as a bridge to successful heart transplant. Of the survivors, 19 (79%) subsequently recovered LV function as defined by an EF  $> 55\%$ .

**Conclusion:** Although mortality is high in children with ACM, the majority is due to sepsis and cancer and rarely due to HF. Complete recovery of LV function is possible in a subset of patients. Collaboration among oncology and cardiology colleagues with a prospective study to optimize outcomes is recommended.