Anthracycline chemotherapy and cardiac dysfunction in Childhood Cancer Survivors- When do they manifest? Experience from Birmingham, UK.

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Background & Aims:
Childhood Cancer Survivors (CCS) treated with Anthracycline chemotherapy are at an increased risk of late cardiac toxicity. However, most studies are based upon heterogeneous, cross-sectional data. The objective of our longitudinal study was to identify the relationship between the onset of cardiac dysfunction and variables such as age, sex, doxorubicin dose and length of follow-up.
Method:
A retrospective analysis of sequential echocardiograms of all CCS diagnosed between 1976 and 1999 and treated with Anthracycline chemotherapy was undertaken. Strict exclusion criteria were applied. A fractional shortening of less than 28% was considered abnormal. Anthracycline doses were converted to Doxorubicin equivalent and the doxorubicin doses were grouped as low (<100 mgs/m^2), moderate (100 to <250 mgs/m^2) and high (> 250 mgs/m^2).
Results:
265 patients treated for childhood cancers were eligible and enrolled in the study. There were 137(52%) males and 128(48%) females with median age of 4.8 years (range 0.1-15.6). 82% were under ten years of age at the time of diagnosis. The patients were treated for a range of childhood malignancies including ALL(40%) and NHL(20%). All patients received a total cumulative Doxorubicin mean dose of 200mgs/m^2 (range 60-564).The median follow-up post end of treatment was 20 years (range 5.8-37.9).
There were 92 patients (35%) who had abnormal echocardiograms with FS <28%, but only 22 patients (8%) had reproducible abnormal findings requiring cardiac intervention and treatment. In this cohort (n=22), 13 patients (59%) were exposed to high doses of doxorubicin and 17 patients (78%) developed cardiac dysfunction within ten years of completing treatment.
Conclusion:
Cardiac dysfunction is a well-recognised late effect following Anthracycline chemotherapy. Our study shows that in two-thirds, cardiac dysfunction manifests within the first ten years post treatment. However, there can be a delayed presentation in some cases as late as 20 years.