

Impairment of cardiovascular function in childhood cancer survivors

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Introduction:

Childhood cancer survivors (CCS) are at an increased risk of developing cardiovascular disease. It is the most common non-cancer cause of death in this patient group. Cardiovascular diseases are caused by cardiotoxic side-effects of anthracycline therapy. The main purpose of this study is to detect any deterioration of cancer therapy on vascular structure, function and exercise capacity.

Methods:

49 patients (25 female) aged 16.5 to 32.0 years (21.5 ± 3.5 years) were examined in our institute between March 2015 and October 2016. All patients were asymptomatic and in NYHA class 1. In average cancer was diagnosed 11.2 ± 4.5 years ago. Ejection fraction (EF) and fractional shortening (FS) were measured by echocardiography to quantify changes of the left ventricle. N-terminal pro-brain natriuretic protein (NT-proBNP) levels were determined as well-known biomarker of left ventricular dysfunction. Additionally, all patients underwent a cardiopulmonary exercise test to detect any limitation in exercise capacity. Patients were categorized in two groups by their anthracycline dosage: All patients with more than 250 mg/m^2 anthracyclines were in the high dose group and compared to patients with moderate dose ($100\text{-}250 \text{ mg/m}^2$) anthracyclines.

Results:

EF was reduced in 12% (EF < 54%) of female CCS and in 8% (EF < 52 %) of male CCS. 59% of the patients showed EF values under 60%. There was no sig. difference between the groups with high and moderate anthracyclines. NT-proBNP was increased in 36% of the female CCS (NT-proBNP > 116 ng/l) and 21% of the male patients (NT-proBNP > 63 ng/l). There was no association between NT-proBNP and EF. Reduced cardiopulmonary exercise capacity was sign. associated with higher NT-proBNP levels ($r = -.342$; $p = .023$) and higher anthracycline dosage ($r = -.293$; $p = .048$).

Conclusion:

Determination of EF, NT-proBNP levels and cardiopulmonary exercise test are useful parameters to detect beginning impairment of cardiovascular function in asymptomatic CCS after treatment with cardiotoxic drugs.