

# **Carotid Intima-Media Thickness, Pulse Wave Velocity and Exercise Capacity in long-term Childhood Cancer Survivors**

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## **Background:**

Childhood cancer survivors (CCS) are at risk for cardiovascular abnormalities leading to an increased morbidity and mortality. The aim of this study was to assess early atherosclerotic changes and exercise capacity to get a better understanding of the long-term effect of anthracyclines on vascular structure, function and physical fitness.

## **Methods:**

In total, 62 asymptomatic patients (NYHA class 1) aged 16 to 42 years ( $22.4 \pm 4.9$  years, 50% female) were examined at the Deutsches Herzzentrum München between March 2015 and May 2017. The malignancy was diagnosed  $11.1 \pm 4.3$  years before this follow-up. For comparisons 106 healthy controls were examined (aged  $25.8 \pm 6.8$  years).

Carotid Intima-Media Thickness (cIMT) was measured in 55 of the patients non-invasively using B-Mode ultrasound. Blood pressure and pulse wave velocity (PWV) were recorded via mobilograph, and a cardiopulmonary exercise test was performed by all patients. CCS who were previously exposed 100-250 mg/m<sup>2</sup> anthracyclines were in the moderate dose group, CCS with more than 250 mg/m<sup>2</sup> anthracyclines were in the high dose group.

## **Results:**

After correction for sex, age, height and weight differences there were no abnormalities in cIMT between CCS (cIMT =  $0.467 \pm 0.007$ ) and controls (cIMT =  $0.473 \pm 0.004$ ). Further, there were no differences in cIMT, blood pressure or PWV between the two anthracycline groups.

Exercise capacity of CCS was significantly reduced to  $92.1 \pm 21.9$  % of predicted peakVO<sub>2</sub> (p= 0.006). The patients with high dose anthracyclines showed a significantly lower performance ( $84.7 \pm 16.6$  % of predicted peakVO<sub>2</sub>) than patients with less than 250 mg/m<sup>2</sup> anthracyclines ( $102.9 \pm 21.7$  % of predicted peakVO<sub>2</sub>; p=0.001).

## **Conclusion:**

There were no anomalies in blood pressure, PWV and cIMT in CCS, but exercise capacity was limited after receiving high anthracycline dosage in the past. Further studies have to focus on other mechanisms than the investigated vascular variables to detect the underlying reasons for that exercise limitations.