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Intima Media Thickness and Cardiovascular Risk Assessment in 764 Adults with Congenital Heart Disease

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Introduction: As long-term survival of adults with congenital heart disease (ACHD) has improved, risk identification for atherosclerotic cardiovascular disease becomes more important in their primary care. Increased intima media thickness (IMT) serves as a marker of structural atherosclerosis and is a valid indicator for future cardiovascular events. This study compared IMT of ACHD with healthy controls and the association with the 10-year risk for a major cardiovascular event (PROCAM score).

Methods: From February 2015 to December 2018, 764 ACHD (356 female, 38.5 ± 11.8 years) and 195 healthy volunteers (114 female, 36.9 ± 13.4 years) received a sonographic assessment of the IMT at the common carotid arteries. In 645 ACHD blood pressure along with information on anthropometrics, smoking habits, cardiovascular family history, and antihypertensive therapy was also taken to calculate the risk of myocardial infarction or stroke within the next 10 years according to the PROCAM risk score.

Results: After adjusting for age, sex, BMI, and current intake of hypertensive drug medication mean IMT of ACHD was 0.538 ± 0.083 mm and ACHD did not show differences to healthy controls (0.541 ± 0.084 mm, $p=.684$). Only patients with coarctation of the aorta (CoA, $n=69$) showed a significantly higher IMT (0.590 ± 0.075 mm, $p<.001$) compared to healthy controls. Furthermore, IMT showed just poor association to the PROCAM risk score ($r=.110$; $p=.005$).

Conclusion: IMT was rather normal in ACHD and only increased in patients with CoA. These structural changes of the vasculature were only poorly correlated to the PROCAM 10-year risk evaluated for the general population. Whether both parameters are relevant for cardiovascular risk assessment in ACHD needs to be clarified in further outcome studies.