

## **Fitness is not associated with carotid intima media thickness in children**

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### **Introduction**

Carotid intima media thickness (cIMT) and cardiorespiratory fitness (CRF) are independently used as predictors of cardiovascular health. We combined these measures in a pediatric population to examine if fitness is associated with vascular status. Furthermore, we calculated cIMT reference values for children aged 7-17 years.

### **Methods**

1017 children, aged 7-17, from Bavaria, Germany, were prospectively studied. cIMT was assessed by B-mode ultrasonography (Hitachi Aloka prosound  $\alpha 6$ ) in 736 children (330 boys/ 406 girls) and calculated as average of two measurements of the left and right common carotid artery according to the Mannheim cIMT consensus [1]. Measurements were performed by two examiners (coefficient of variation: 8.51%). CRF was determined by estimation of VO<sub>2</sub>max with the PACER test [2]. Further measures consisted of blood pressure, body weight and height, hip and waist circumference. Age- and height-normalized cIMT reference values were calculated for 690 non-obese children (310 boys/ 380 girls) applying the LMS method [3]. The study was funded by "Sternstunden e.V. and Landratsamt Berchtesgadener Land".

### **Results**

cIMT increased with height, weight, hip circumference, systolic blood pressure, body mass index and age ( $p < .001$ ). There was no significant correlation between cIMT and VO<sub>2</sub>max. Multiple regression analysis associated a small waist circumference with low cIMT (standardized  $\beta = -.666$ ), the heavier and taller children were, the thicker cIMT. Boys within the youngest and oldest age categories (8-9.99 and 16-17.99 years) had significantly higher cIMT values than girls ( $p < .05$ ). No sex differences occurred in children from 10-15.99 years.

### **Conclusions**

In this study, CRF is not significantly associated with cIMT. Nevertheless, it would be wrong to conclude that fitness doesn't affect cardiovascular health. As structural changes in IMT develop over a long time, the same might be for positive effects due to good CRF. Parameters of arterial stiffness (pulse wave velocity, augmentation or stiffness index  $\beta$ ) may respond faster and will therefore be analyzed in further studies.

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