

**The Role of the Leptin-to-Adiponectin Ratio in Cardiovascular Prevention in Childhood.  
First results from the “Get Fit – Stay Healthy” Project**

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**OBJECTIVE:** The development of cardiovascular disease begins in childhood [1], with structural and functional changes of the endothelium already existing in obese children [2]. But it is incompletely understood which factors are involved in the pathogenesis of atherosclerosis and further the protective mechanisms to obtain endothelial health are still unclear.

However the improvement of prevention strategies relies on a better understanding of which risk factors are linked to early subclinical atherosclerotic changes and thereby of allowing for the identification of children at high cardiovascular risk.

**PATIENTS AND METHODS:** Therefore we investigated 117 healthy school children (52 female) aged in the median 12.3 years (interquartile range: 11.9 – 12.9 years) with a median body mass index standard deviation score (BMI-SDS) [3] of 0.06 (interquartile range -0.93 - 1.18). The children took part in the “Get-fit – Stay healthy” project, starting off with baseline measurements from April 2011 to October 2011. Thirty children (25.6%) with a BMI-SDS >1 were defined to be at cardiovascular risk. We examined waist circumference, waist-to-height ratio, blood pressure and serum lipids. All children had ultrasound sonography (ProSound alpha7, Hitachi/Aloka) on carotid intima media thickness (IMT), carotid artery compliance and stiffness.

**RESULTS:** Univariate analysis showed that children at risk had higher leptin-to-adiponectin ratio ( $p<0.001$ ), a lower high-density lipoprotein ( $p<0.001$ ) and higher triglycerides ( $p=0.001$ ). There was no difference in low-density lipoprotein ( $p=0.751$ ), total cholesterol ( $p=0.284$ ) and systolic blood pressure ( $p=0.268$ ). Carotid IMT ( $p=0.845$ ) and stiffness ( $p=0.191$ ) as well as compliance ( $p=0.374$ ) did not differ. Leptin-to-adiponectin ratio remains as only independent risk factor ( $p<0.001$ ) in the multivariable model.

**CONCLUSIONS:** Leptin-to-adiponectin ratio is a strong independent marker of cardiovascular risk already in this age group. Its impact exceeds that of other blood lipid markers and systolic blood pressure. Early negative structural or functional changes towards a reduction in stiffness and compliance as well as an increase of the intima-media complex could not be shown.

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[2] Tounian P. *Lancet* 2001; 358:1400-1404.

[3] Kromeyer-Hauschild K. *Monatsschr Kinderheilkd* 2001; 149: 807–818 (German)