Introduction: The intima media thickness (IMT) of the A. carotis communis, is established as a valid surrogate non invasive marker for the progression of cardiovascular disease in adults. However, mean basic risk factors are already detected in childhood and adolescent, e.g. akinesia and hyperalimentation [1] and being tracked into adulthood [2]. In this context it is of importance to establish this diagnostic parameter for the estimation of the individual cardiovascular risk profile. Therefore the objectives of the study were firstly to acquire age-specific IMT norm values in healthy children and adolescents. Secondly, to examine if the IMT is enlarged in children who are hospitalized for obesity. Thirdly to investigate an association between IMT and cardiovascular risk factors. Methods: 260 healthy boys and girls from Munich schools (age 8-15 years) and 114 obese boys and girls were examined. All subjects underwent sonography of the A. carotis communis, distal of the carotid artery bifurcation on a segment 8805; 1 cm length (GE Logiq Book XP, 10 Mhz linear probe) to evaluate IMT. Sigma Scan Pro 5.0 was used for IMT offline analysis. Further, anthropometric data, BMI, body composition (FUTREX 6100 AL), resting (15 min.) heart rate and blood pressure were taken. All subjects performed a standardized and valid physical fitness test. Results: The IMT ultrasound measurement is applicable in healthy and obese children (examination time approx. 5 min/patient; offline analysis 8 min/picture). The intra observer variability was 3% (deviation mean 0.017mm, tested in 132 subjects). Age-specific IMT norm-values in healthy subjects could be assessed in 5 age-groups. A 2-year age classification was done. IMT value in age group 8/9yrs. was 0.504mm (SD=0.049) in male, 0.490 (SD=0.041) in female and increased in age group 14/15yrs. up to 0.534 (SD=0.041) in male and 0.504 (SD=0.038) in female. IMT progresses with age about 0.01-0.02mm. IMT in obese children show in almost all age groups increased values. A positive association between IMT and height (cm), weight (kg), systolic blood pressure (mmHg) (each with p>0.01) as well as IMT, body fat (%) and BMI (each with p<0.05) was determined. Physical fitness parameters do not show an association to IMT values.

Conclusions: The sonographic measurement of the IMT served as a repeatable and reliable method for healthy and obese children and adolescents. Age-specific IMT norm values could be assessed. Increased IMT values for obese were detected. The sonography of the IMT can be used to estimate the individual cardiovascular risk profile more detailed.

References:

Keywords: Exercise and Health, Cardiovascular, Children