

hip measurement showed positive correlation ( $P < 0.05$ ) with body fat % by BodPod. Total body fat % by DXA correlated with body fat % by BodPod ( $P < 0.05$ ).

**Conclusion:** Affordable and easy to use skinfold caliper and circumference measurements correlate with expensive methods as DXA and BodPod, and can give an approximation of the young obese childrens fat mass status. DXA and BodPod total body fat % measurements correlate.

**Conflict of interest:** None disclosed.

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### Waist circumference and motor coordination in Portuguese school children

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**Introduction:** Children's motor coordination may affect their activity pattern and thereby influence their body-fatness. The aim of this study was to analyze the relation between motor coordination and waist circumference (WC) levels, in a Portuguese sample of school children aged 8–12 years old.

**Methods:** The sample comprised 402 urban school children (girls-46.8%), aged 8 to 12 years old (mean  $9.6 \pm 0.6$  years) from North of Portugal. WC was measured with standardize protocols. Age- and sex-adjusted Z-scores were also computed for WC. Motor coordination levels were assessed with the *Körperkoordination Test für Kinder* (KTK) and children were classified according to age-and sex KTK criteria [1].

**Results:** In motor coordination, 27.1% girls showed disturbance of coordination; 33.5% insufficiencies of coordination; 39.4% normal coordination and 0% good coordination. Corresponding figures for boys were 7.9%; 39.3; 50.9%, and 1.9% respectively ( $P < 0.001$ ). Linear regression analysis showed that Z-Scores WC were negatively associated with motor coordination (Unstandardized  $B = -5642$  SE:0.706,  $P < 0.001$ ).

**Conclusion:** Low-motor coordination levels are negatively associated with waist circumference Z-scores. The early identification of children with poor motor coordination is crucial in order to implement and develop health-related behaviors.

**Conflict of interest:** None disclosed.

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**Reference:** 1. Schiling F. *Körperkoordination Test für Kinder*, KTK. Beltz Test GmbH. Weinheim. 1974.

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### Morbid obesity is present in all age-groups of children and adolescents: 185 cases at an out-patient clinic in Vienna in 2.5 years

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**Introduction:** Severe forms of obesity ('morbid' obesity,  $> 99.5$  BMI percentile) have become also in adolescents much more common in recent years. In our out-patient clinic for obesity, we assessed the

prevalence and comorbidity of extremely obese patients among overweight children and adolescents who were referred to us in the last 2.5 years.

**Methods:** Prior to therapeutic regimes a medical investigation takes place in all patients. With the external evaluation program (APV-System) data of all patients were standardised collected. We calculated BMI, blood pressure, total cholesterol-, HDL, LDL, triglyceride values, blood glucose and the OGTT (Oral Glucose Tolerance Test).

**Results:** Out of 289 patients, 185 patients (64%) had a BMI exceeding the 99.5 percentile (= morbid obesity). 49.8% of these morbid obese had elevated systolic and 12.6% diastolic blood pressure values. 11.9% of them had increased cholesterol values, 12.1% LDL values and 41.1% triglyceride values. In 4.7% increased fasting blood sugar levels above  $> 110$  mg/dl was detected. A pathological glucose tolerance was found in 9.4% patients, and in one case Diabetes II  $\geq 200$  mg/dl has been diagnosed. Children and adolescents with morbid obesity had significantly increased blood pressure and cholesterol levels compared to overweight/obese patients. Triglycerides, LDL and HDL values were not significantly different.

**Conclusion:** Cardiovascular risk factors are very common in morbid obese children. This fact underlies the necessity of an early multi-professional therapy.

**Conflict of interest:** None disclosed.

**Funding:** No funding.

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### Non-alcoholic fatty liver disease investigated by magnetic resonance spectroscopy and correlated to BMI SDS and liver parameters in serum of 73 obese children in Denmark

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**Introduction:** To investigate the presence of non-alcoholic fatty liver disease (NAFLD) in severely obese children. To establish correlation of the amount of fat in the liver with elevations in measurements of liver parameters and BMI.

**Methods:** Liver fat was assessed by magnetic resonance spectroscopy (MRI). NAFLD was defined as a liver fat percentage above 9%. Weight and height were measured in light indoor clothes. Body mass index (BMI) standard deviations score (SDS) was calculated with adjustment for age and gender. Fasting blood samples were analysed for lipids and hepatic enzymes.

**Results:** Seventy-three Danish children (38 boys), with a mean age of  $13.5 \pm 2.7$  SD (range 6–20 years) and with a mean BMI SDS of  $3.1 \pm 0.5$  SD were investigated by MRI. Twenty-eight percent ( $n = 21$ ) showed evidence of NAFLD. Sixty-two percent of the children with NAFLD were boys. For those with NAFLD, the median liver fat percent was 27.5% (range 9.4–64.4%). Children with NAFLD had significantly higher BMI SDS ( $P = 0.001$ ) and higher levels of alanine aminotransferase (ALT) ( $P = 0.001$ ) compared to the children with liver fat percent less than 9%. The degree of fat in the liver was positively correlated to BMI SDS, gender, triglycerides (TG), ALT, gamma-glutamyl transferase (GGT) and lactate dehydrogenase (LDH) ( $r^2 = 0.58$ ).

**Conclusion:** BMI SDS is positively correlated with NAFLD and the degree of fat in the liver is associated with ALT, GGT, TG and LDH concentrations.