Which amount of BMI-SDS reduction is necessary to improve cardiovascular risk factors in overweight children?

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Rationale and Study Design:
Objective: To determine the BMI-SDS reduction to improve cardiovascular risk factors (CRFs) in overweight or obese children.

Design: Prospective observation study.

Patients: 1388 overweight or obese children (mean BMI 27.9±0.1, mean age 11.4±0.1 years, 43.8% male, 45.5% prepubertal).


Statistic approach: Multivariable regression analysis set up for all CRFs, respectively, with change in CRF as the dependent variable and BMI-SDS at baseline as the independent variables. Moreover, we adjusted for age at baseline, sex, baseline pubertal stage and change in pubertal stage.

In case of significant correlation between baseline CRF and baseline BMI-SDS, we included an interaction term between both variables in the model. BMI-SDS decrease was included continuously as well as categorized into the model.

Unadjusted changes of CRFs during a 1-year lifestyle intervention separated to degree of BMI-SDS reduction in overweight children with abnormal CRFs at baseline

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<th>Δ BMI-SDS</th>
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<td>-0.125</td>
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Conclusion:

• BMI-SDS reduction ≥0.25 improved significantly hypertension, hypertriglyceridemia and low HDL-cholesterol, while a BMI-SDS >0.5 doubled the effect.

• Based on our data clinicians can calculate for example that for a reduction of an elevated diastolic blood pressure of 80 mmHg by 10mmHg a decrease of 0.25-0.5 BMI-SDS* is necessary (all data are published in JCEM 2016;10:jc20161885)

• Based on the IOTF percentiles, a BMI-SDS reduction of ≥0.25 in one year is approximately a BMI reduction of 0.5 kg/m² in a 7-year old child and a BMI reduction of 1.0 kg/m² in a 13 year old adolescent. A BMI-SDS reduction of 0.5 represents approximately a weight loss of 5 kg in a male adolescent with 1 cm growth per year or a stable weight in children growing ≥5 cm per year.