Concomitant changes in Full Body DXA Values and BMI SDS during Multidisciplinary Treatment of Childhood Obesity

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Objective

The aim of this study was to investigate changes in body composition in relation to changes in body mass index standard deviation score (BMI SDS) during a multidisciplinary intervention for childhood obesity.

Hypothesis: Reductions in body fat percentage may not be revealed by reductions in BMI SDS.

Background

Obesity is a continuously increasing problem worldwide, and especially the increase in childhood obesity is alarming[1].

Body mass index (BMI) has been described as a valuable and easy measure of body fatness, and has been found to correlate strongly with body fat measured by dual-energy X-ray absorptiometry (DXA) in healthy children and adolescents[2]. However in adult normal weight and obese women and in overweight and obese men, BMI seems to have a relatively poor ability to predict adiposity [3]. In children it seems, that BMI standard deviation score (SDS) has a low sensitivity and a high specificity hereby wrongly classifying obese individuals in the normal weight category[4].

Methods

One-hundred-ninety-three children and youths (108 girls) were included from The Children's Obesity Clinic upon entering treatment for childhood obesity.

Inclusion criteria:

- Age 6-21 years
- BMI above the 90th percentile for age and sex according to Danish BMI charts[5]

DXA investigation was performed at the baseline and each participant offered follow-up DXA scans in intervals of 1-2 years to monitor treatment response.

All study participants were examined immediately before the DXA examination with anthropometric data comprising height and weight.

The study has been ethically approved by the Regional Ethical Committee of Region Zealand (Project number: SJ-104) and performed in accordance with the Helsinki Declaration.

Results

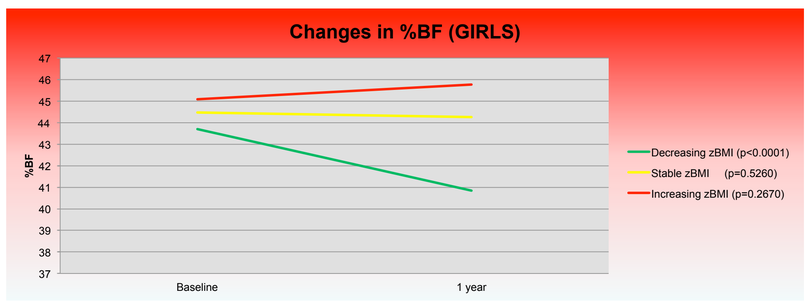
Table 1: Baseline values (mean and ranges).

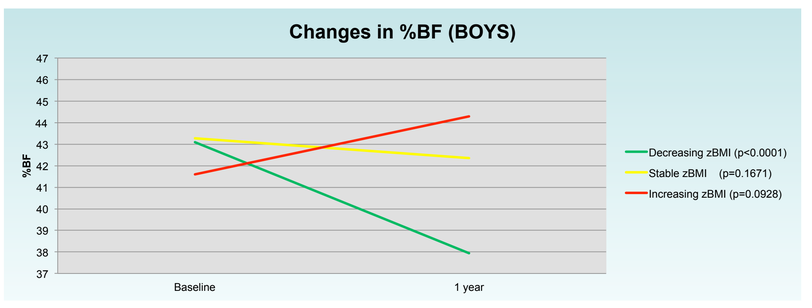
	BMI SDS	%BF
Total (N=193)	2.8 (1.5-5.2)	43.6 (28.9-57.1)
Girls (N=108)	2.71 (1.5-5.2)	44.2 (34.9-57.1)
Boys (N= 85)	2.97 (1.6-4.9)	42.9 (28.9-53.1)

57% reduced their BMI SDS, 30% had a stable BMI SDS (ΔBMI SDS +/- 0.15), and 13% increased their BMI SDS during treatment.

Reductions in BMI SDS were positively correlated to reductions in %BF (P<0.0001).

The group reducing BMI SDS reduced their %BF by -4.0% (95% CI: [-4.8; -3.3], P<0.0001), the group with a stable BMI SDS tended to reduce their %BF by -0.5% (95% CI: [-1.1; -0.2], P=0.15), and the group increasing BMI SDS increased their %BF by 1.6% (95% CI: [0.1; 3.1], P=0.04).





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Conclusion

During multidisciplinary treatment of childhood obesity, a reduction in %BF is possible even in children exhibiting a stable BMI SDS indicating a favorable treatment response in a larger percentage of children treated.

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