

# Efficacy of the treatment for childhood obesity in specialist care – age over 10 years at baseline and acanthosis nigricans predict a worse outcome



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## BACKGROUND

Treatment of pediatric obesity is challenging and data on the long-term efficacy of pediatric obesity treatment are insufficient.

## OBJECTIVE

We wanted to evaluate the efficacy of pediatric obesity treatment in specialist care and to find out factors, which have a major impact on the outcome.

## METHODS

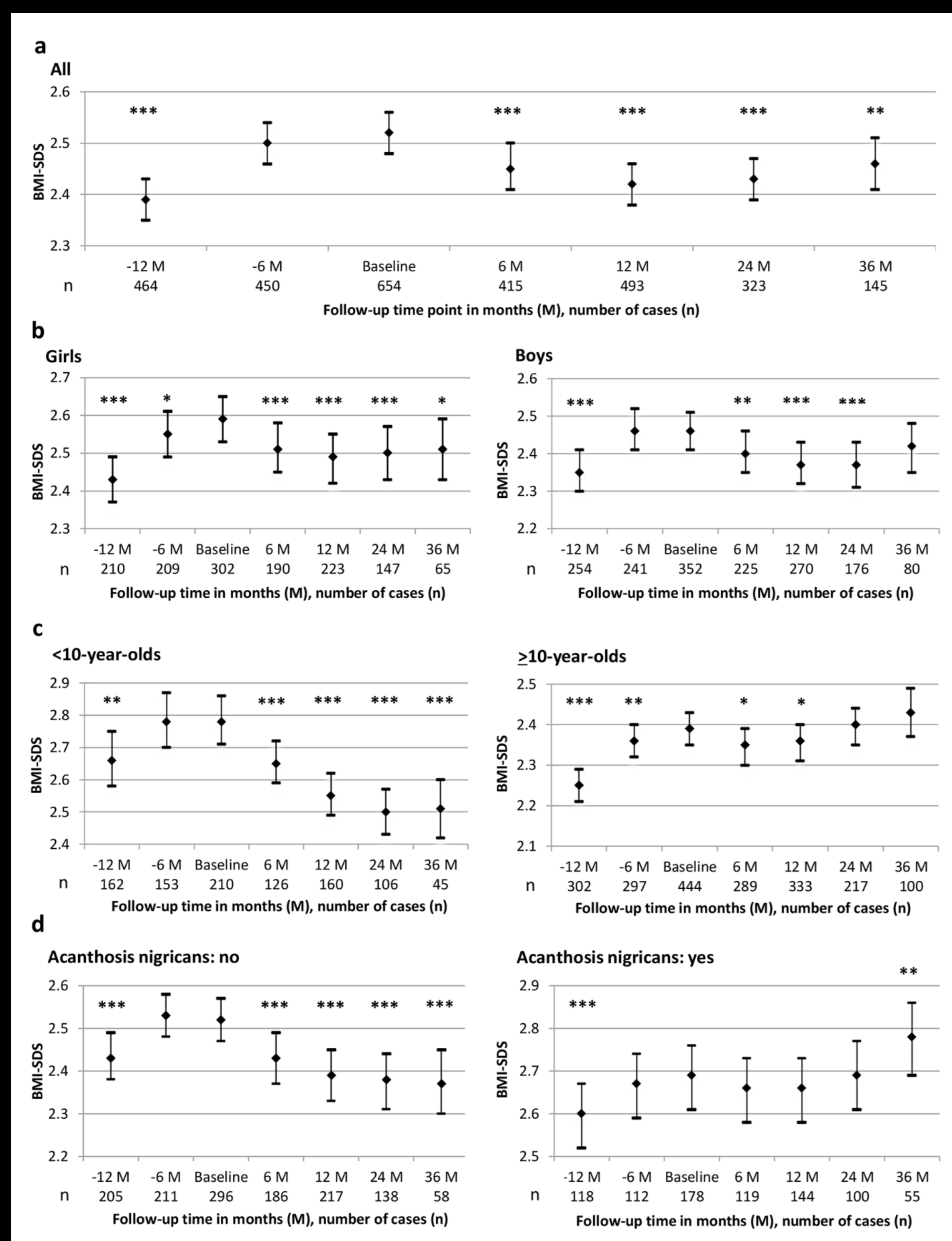
The data of this longitudinal register-based study was derived from the patient records of 654 children (girls n = 302, 46%) aged 2 to 18 years treated for obesity between 2005 and 2012 in three pediatric clinics covering whole Eastern Finland. BMI-SDS based on the national growth references (1), was recorded one year before the treatment, at baseline, and over a 3-year follow-up. The change in BMI-SDS and potential factors influencing the outcome (age and BMI-SDS at baseline, sex, presence of acanthosis nigricans (AN), psychiatric disturbances, parental obesity, motivation for treatment, and adherence to the protocol) were explored with mixed model analyses.

## RESULTS

BMI-SDS increased during the year before baseline (mean difference 0.13 [SD 0.14];  $p < 0.001$ ), and decreased during follow-up (at 0.5 year -0.07 [0.01]; at 1 year -0.10 [0.01]; at 2 years -0.09 [0.02], for all  $p < 0.001$ , and at 3 years -0.06 [0.02],  $p = 0.005$ ). The presence of AN or age  $\geq 10$  years at baseline attenuated the treatment outcome and the long-term outcome was negligible. Children aged  $< 10$  years at baseline and those without AN had a significant and long-lasting decrease in BMI-SDS (at 3 years -0.27 [0.04],  $p < 0.001$  and -0.14 [0.04],  $p < 0.001$ , respectively). In addition, motivation for treatment, adherence to the protocol, and high BMI-SDS at baseline positively affected the outcome. On the other hand, sex, psychiatric disturbances, or parental obesity had no impact on it.

## CONCLUSIONS

Treatment of pediatric obesity is most effective when started at a younger age. The association of AN with a poor treatment outcome suggests a link to insulin resistance.



**Figure 1.** BMI-SDS<sup>1</sup> (mean, 95% CI) at 12 and 6 months (M) before baseline, at baseline, and at 6 M, 12 M, 24 M, and 36 M of follow-up in all study subjects (a), in girls and boys (b), in  $< 10$ - and  $\geq 10$ -year-olds (c), and in children without and with the presence of acanthosis nigricans (d). Statistical significance for the change in BMI-SDS between each time-point and baseline revealed in multivariate linear mixed model analyses after adjustment for age at baseline: \*\*\* $P < 0.001$ , \*\*  $P < 0.01$ , and \* $P < 0.05$ .

## REFERENCE

1. Saari A, Sankilampi U, Hannila ML, Kiviniemi V, Kesseli K, Dunkel L. New Finnish growth references for children and adolescents aged 0 to 20 years: Length/height-for-age, weight-for-length/height, and body mass index-for-age. *Ann Med.* 2011;43:235-48.