

Postnatal catch-down growth is not associated with disturbances in metabolic parameters in large-for-gestational-age infants at the age of eight years

J. Peters, S. Joergens, F. Schreiner¹, P. Bartmann², J. Woelfle¹, B. Gohlke¹

¹Pediatric Endocrinology Division, ²Neonatology Division; Children's Hospital, University of Bonn, Germany



P2-499

Background:

Low birth weight, unfavorable intrauterine conditions, and postnatal catch-up growth are associated with a subsequent impact on growth, pubertal development, and metabolic disturbances later in life.

Objective:

In contrast to what is known for low birth weight infants only little is known about the effect of catch-down (c-d) growth and its effect on metabolic parameters in children born large-for-gestational-age (LGA).

Patients/Methods:

101 pre-pubertal children with a birth-weight and/or length > 95.P were examined at a median age of 8.0 years (range, 4.3-12.1). Catch-down was defined as postnatal change of SDS > 0.67 during the first year of life. Fasting insulin, HbA1c, HOMA, lipoproteins, IGF-BP1, Leptin, Visfatin, Amylin, Ghrelin, IGF-1, IGF-BP-3 were analyzed in all individuals.

To show the difference between no/moderate and pronounced catch-down, subjects were divided into quartiles according to the degree and timing of catch-down growth, respectively

c-d max: children with the maximum catch-down growth within the first twelve month

c-d low: children with no or only low catch-down growth in the cohort from birth to one year.

Results:

Auxology

Catch-down for weight, length, and BMI was observed for the vast majority of the group (88%) during the first year beginning mostly at three months of age and lasting until one year and remained unchanged thereafter (Fig 1 and 2).

However, actual mean height-SDS was still significant different from target height

(0.67 SDS vs 0.22 SDS; $p < 0.001$) (Fig.3).

Catch-down growth and body composition

Individuals who did not catch-down were still significantly taller ($+1.57 \text{ SDS} \pm 0.85$ vs $0.54 \text{ SDS} \pm 1.0$; $p = 0.001$) and heavier than those who showed a catch-down (weight-SDS ($+0.99 \pm 0.59$ vs 0.45 ± 1.0 ; $p = 0.013$). Therefore, no difference in BMI-SDS was found. Both groups had no difference in mean target height.

By comparing the quartile with highest catch-down (c-d max) to those without or very moderate catch-down (c-d low) (Fig. 4) we found that the individuals with no catch-down had more total subcutaneous fat mass than the individuals with high catch-down (skin fold SDS difference: 1.1; $p = 0.007$). Significant deviations were identified between these two groups in waist and hip circumference SDS (waist circumference SDS difference: -0.6 ; $p = 0.025$; hip circumference SDS difference: -0.6 ; $p = 0.04$)

Metabolic Parameters

No significant differences between the two groups were found for all measured metabolic and hormonal parameters - Fasting insulin, HbA1c, HOMA, lipoproteins, IGF-BP1, Leptin, Visfatin, Amylin, Ghrelin, IGF-1, IGF-BP-3 .

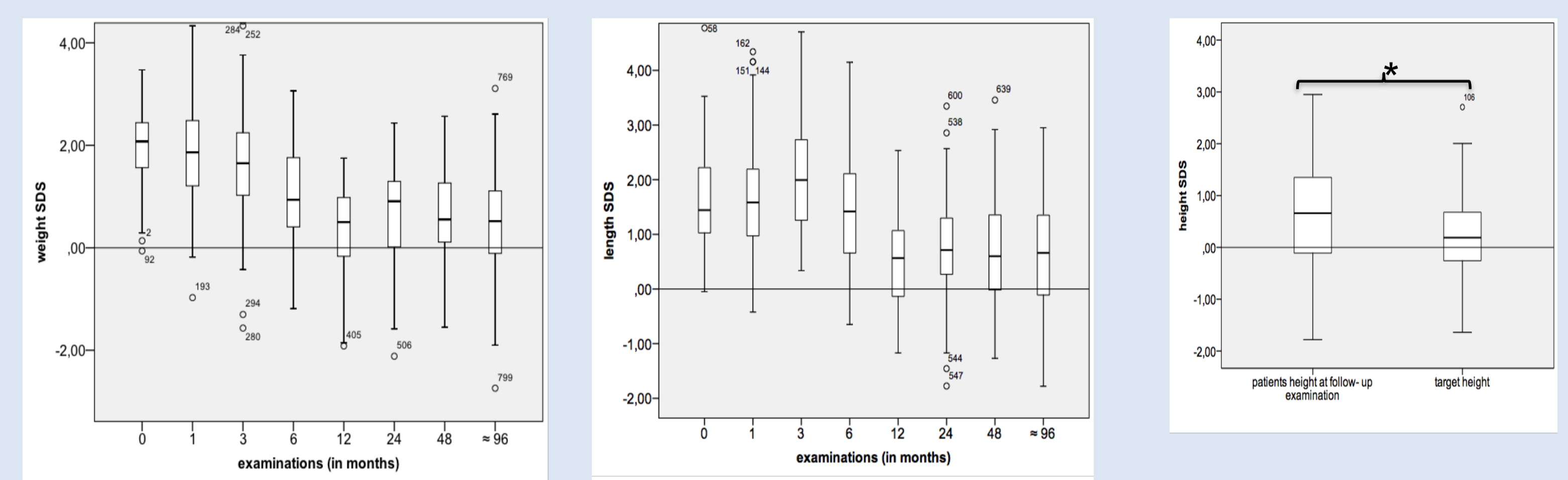


Fig. 1 + 2: Longitudinal data for weight- and length-SDS

Figure 3
Height—SDS
individuals and
target-height SDS

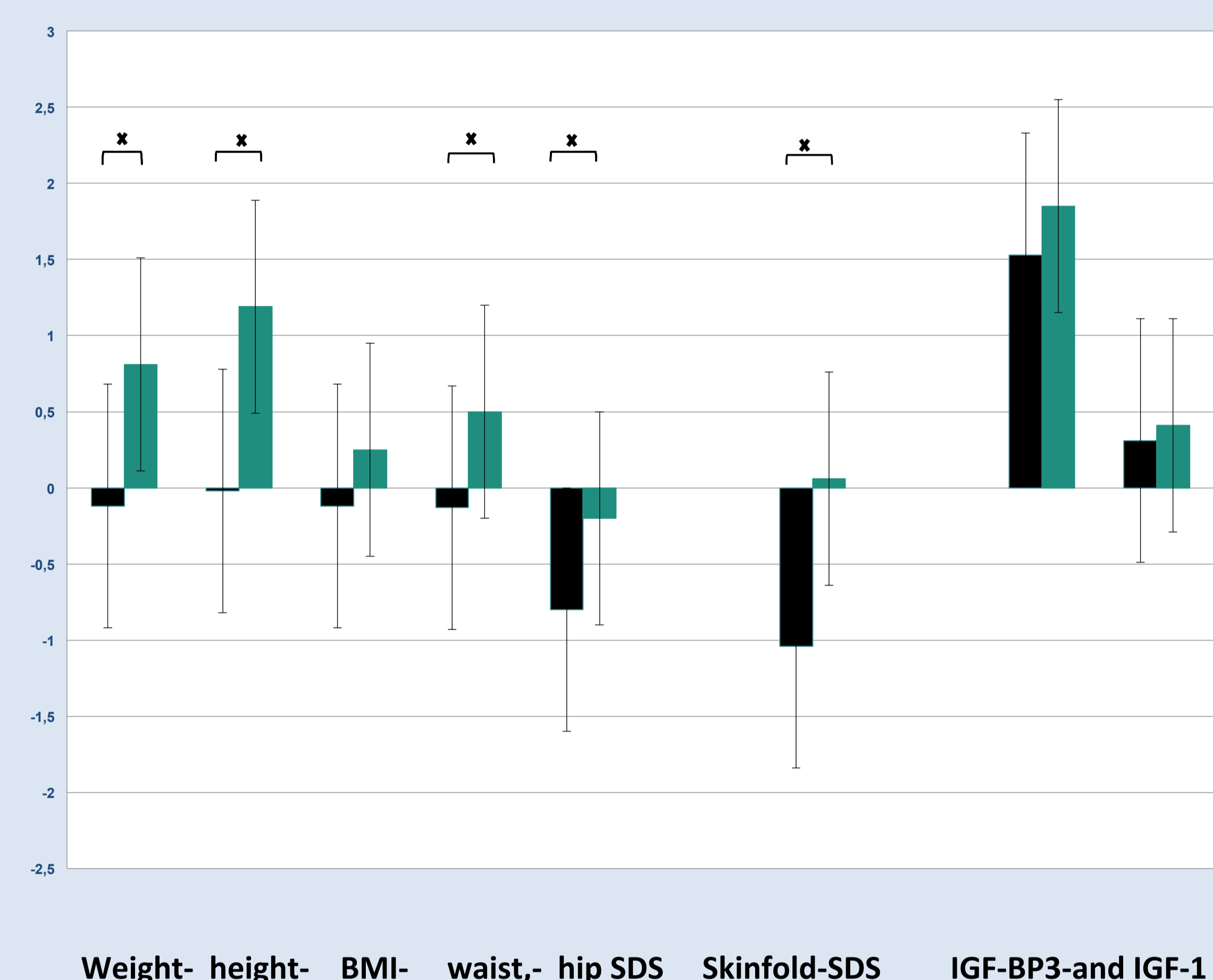


Figure 4
Auxiological and
metabolic
parameters in
individuals with
highest catch-down
(blue) in comparison
to those without
catch-down (green)

Conclusion: The vast majority of infants born with LGA show a pronounced catch-down growth, which lead to a rapid normalization of length/height and weight. However, height-SDS remained significant different from target height. Although height and weight-SDS remained different between those LGA with vs. no catch-down growth during the first year of life we could not find significant differences in the measured endocrine and metabolic parameters. Therefore, no signs of disturbance of carbohydrate or lipid metabolism was found in association to catch-down growth.