Growth curves for achondroplasia height, weight, BMI and head circumference

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Conclusion
Sex- and age-specific curves for height, weight, body mass index and head circumference were constructed in a format that is useful for clinical practice. These can therefore support the clinical work when following children with achondroplasia.

Introduction
Close monitoring of growth is vital when following children with achondroplasia, yet existing growth references are illustrated in a rather simple format and their clinical usability is therefore not optimal.

Aim
The aim of this study was to construct age-specific growth curves for height, weight, body mass index and head circumference in a format that makes it easy to follow growth development of the individual.

Method
A combination of longitudinal and cross-sectional measurements were collected from about 500 children and adolescents with achondroplasia aged 0 to 20 years. Average number of height measurements per age group was 37 (total n = 3902). Standard deviation curves were estimated using the Generalized Additive Models for Location, Scale and Shape (GAMLSS).

Results
Retrieved averages for the four variables were similar to existing growth references by e.g. Horton et al. and Hoover-Fong et al. To better summarize growth development during the first 4 years of age, the curves for head circumference, length/height and weight were combined on the same page using logarithms for all axes. For 4 to 20 years, a linear age axis was chosen. For the BMI-curve, 0 to 20 years, linear age axis and logarithmic BMI-axis gave the best clinical usability.

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This project is sponsored by Stiftelsen Promobilia and H.K.H. Kronprinsessan Lovisas förening för barnsjukvård. Special thanks to PC PAL for all support in the graphical construction of the curves.