

New knowledge of pubertal growth

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In monitoring and prediction of children's growth, the spurt in puberty is often considered too variable to be predictable. However, new findings and methods enable a better picture of how children and adolescents grow, especially during puberty.

"Growth reflects health and can be a diagnostic indicator, capable of revealing both diseases and psychosocial problems. Measuring and monitoring [height](#) and weight are therefore among the most important tasks for child health centers and in school health services."

The speaker is Anton Holmgren, Ph.D. of pediatrics at Sahlgrenska Academy, University of Gothenburg, Sweden, and a pediatrician specializing in pediatric endocrinology and childhood diabetes.

In working on his Ph.D. thesis, Holmgren has been involved in developing a new mathematical growth model that can, in more detail than before, describe height-trend variations in children and adolescents, especially during puberty.

Holmgren has also specifically studied how Body Mass Index (BMI) in childhood can be linked to height gain. The data in his study comprise height and weight figures on 1,901 subjects during their childhood.

Strong spurt with lower BMI

A high BMI early in life was found to be generally associated with a greater proportion of height gain before puberty. The actual spurt was

then smaller and, moreover, puberty occurred earlier.

In the category of children with lower BMI and later onset of puberty, the spurt was all the stronger. Those whose puberty was delayed also had several extra years to grow in, and quite simply ended up taller. All these results apply at group level, not to separate individuals.

"The smallest pubertal spurt was in the group of children with the highest BMI in childhood—a result no previous study has been able to show, but which confirms many pediatricians' clinical experience," Holmgren says.

Better forecasts and assessments

The findings help to make pubertal growth, as such, more clearly predictable. This improvement in predictability makes it easier to distinguish among the various growth processes that take place during the childhood years—processes that partially overlap.

What is happening is, first, "quadratic growth", a process of relatively even intensity throughout [childhood](#). The other key processes are, second, the infant's exponential growth (the very steep rise during the first year of life) and, third, the pubertal spurt that normally starts at age 8–13.

The ability to predict early or late [puberty](#) will, in the long term, make improved height-gain forecasts at individual level possible. This will enhance prospects of detecting hidden diseases and, for example, facilitate assessment of the outcomes of ongoing growth-hormone treatments.

"With monitoring and analysis of height gain, we can detect diseases and assess how well treatments are working," Holmgren says.

Provided by University of Gothenburg

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