INTRODUCTION

Growth patterns are dynamic processes both for the developing individual and at the population level over time. Patterns of growth differ between individuals, sexes and populations. Over the last decade, humans in affluent countries have become progressively taller and puberty and the pubertal growth spurt has started earlier. These changes are referred as secular changes or trends.

The QEPS growth model can analyse and describe growth patterns in a detailed way with precise growth estimates. The QEPS growth model, developed and validated in GrowUp/Gothenburg, used for developing growth references and investigating healthy/pathological growth, lacks external validation from other longitudinal cohorts of healthy individuals.

RESULTS

The main QEPS-height estimates (Emax/Qmax/Pmax) had confidence intervals of 1.1-1.2 cm in the Edinburgh cohort compared to 1.4-4.3 cm in the Gothenburg group.

Despite 2.6cm shorter stature (due to less QE-function growth) in the Scottish cohort, the growth patterns of the cohorts were similar. The timing of pubertal growth showed no statistical differences between the study groups (Table 1).

The QEPS model now validated for the first time in another longitudinal study, with high accuracy and narrow confidence intervals (CI) indicating high precision. The CI has become shorter due to regular and shorter intervals between measurements.

The Scottish and Western-Swedish cohorts born in mid-1970s showed for both sexes strikingly similar growth patterns, especially for pubertal growth.

MATERIAL & METHODS

The longitudinal growth data was obtained from the Edinburgh and the GrowUp/Gothenburg cohorts. The QEPS-model was used to describe length/height from birth to adult height with confidence intervals and multivariate regression performed to estimate the contribution of different QEPS-functions to adult height. Analyses of growth patterns were done with the QEPS-growth model.

The Edinburgh longitudinal Growth Study consisted of children born 1972 to 1976. The present analysis included data from 157 healthy individuals (88 girls), with growth data evenly distributed through all ages, median of 34/37 measurements for girls/boys, with a median age of 7.6/8.5 years for girls and boys (Figure 1).

The GrowUp 1974 Gothenburg cohort consisted of individuals born at full term around 1974 in Sweden, with longitudinal growth data. The present analysis included data from 2339 healthy individuals (1265 girls). Growth data was most frequently collected from QEPS-functions.

Figure 2. Distribution of length/height by age (upper panel Edinburgh longitudinal cohort, lower panel GrowUp 1974 Gothenburg cohort; males, left; females, right).

Figure 3. QEPS Pubertal height functions (medians) for Gothenburg girls (red open circles) and Edinburgh girls (black dots), for Gothenburg boys (open blue circles) and for Edinburgh boys (black dots) in relation to chronological age.

CONCLUSIONS

The QEPS model now validated for the first time in longitudinal study with Swedish growth cohorts of healthy individuals, fitted the Edinburgh cohort well, with high accuracy and narrow confidence intervals (CI) indicating high precision. The CI has become shorter due to regular and shorter intervals between measurements.

The Scottish and Western-Swedish cohorts born in mid-1970s showed for both sexes strikingly similar growth patterns, especially for pubertal growth.

REFERENCES