GH-pattern with high troughs are often found after daily subcutaneous rhGH-injection in children

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Aim
To study pharmacokinetics, pattern of the injected GH serum concentration and inter-individual variation after subcutaneous (sc) rhGH-injection in a large group longitudinally followed GH treated children.

Background
Endogenous GH-pattern is characterized by high peaks (growth signal) and low troughs (metabolic signal). Variation in uptake of exogenous GH given by daily sc injection at bedtime has not been studied in a longitudinally followed children.

Conclusions
- The pharmacokinetics of injected GH was found to have both a great intra- and inter-individual variation
- The max GH level in serum and AUC were higher after a injection with the higher dose
- 60% of the GH-curves had not returned to the zero-level before the next injection in Clinical-setting mirroring real life

Results

GH-curves in *Clinical-setting* for total group n=429 and per GH-dose group 33, n=288 or 67µg/kg/d, n=106
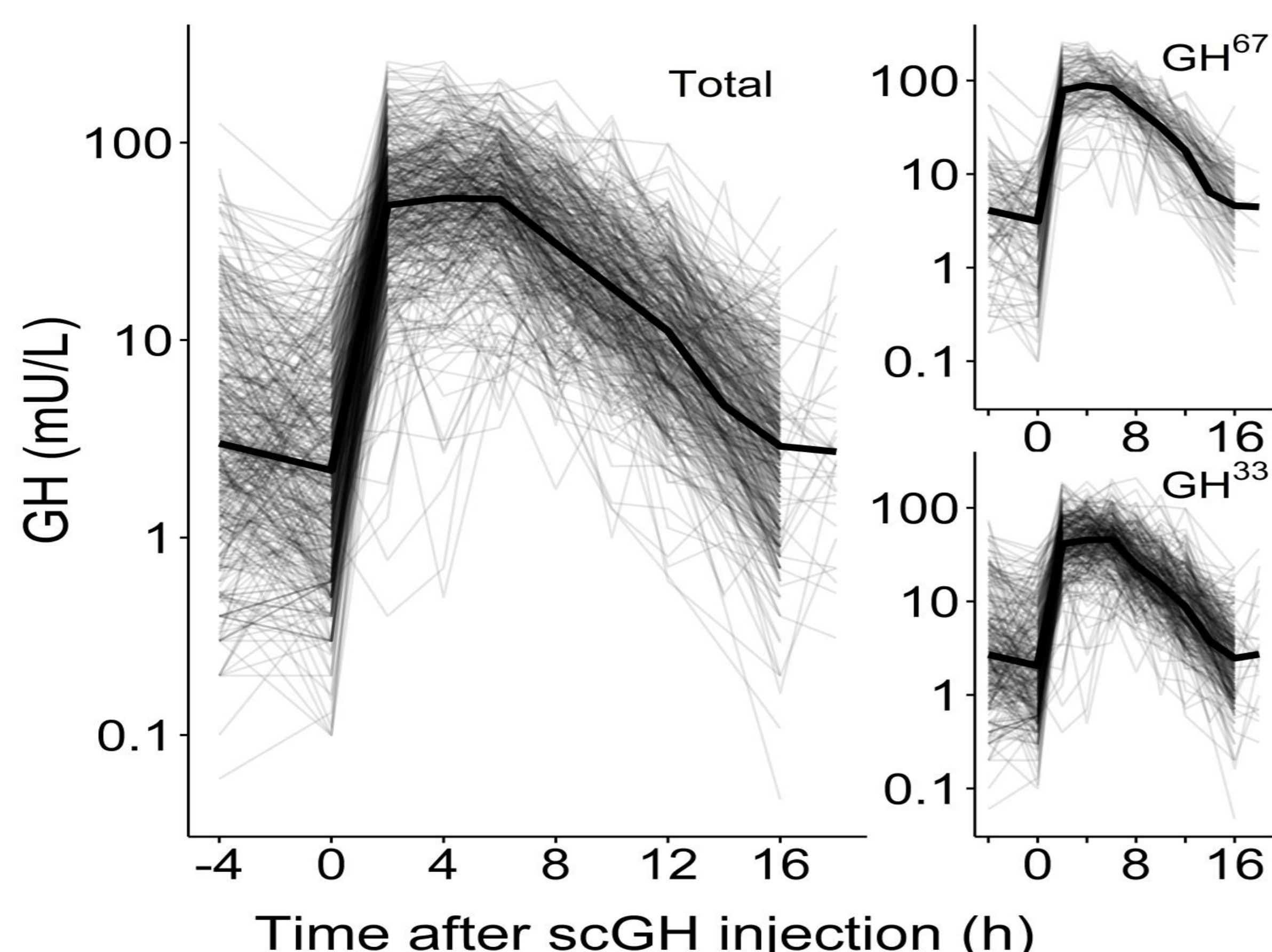
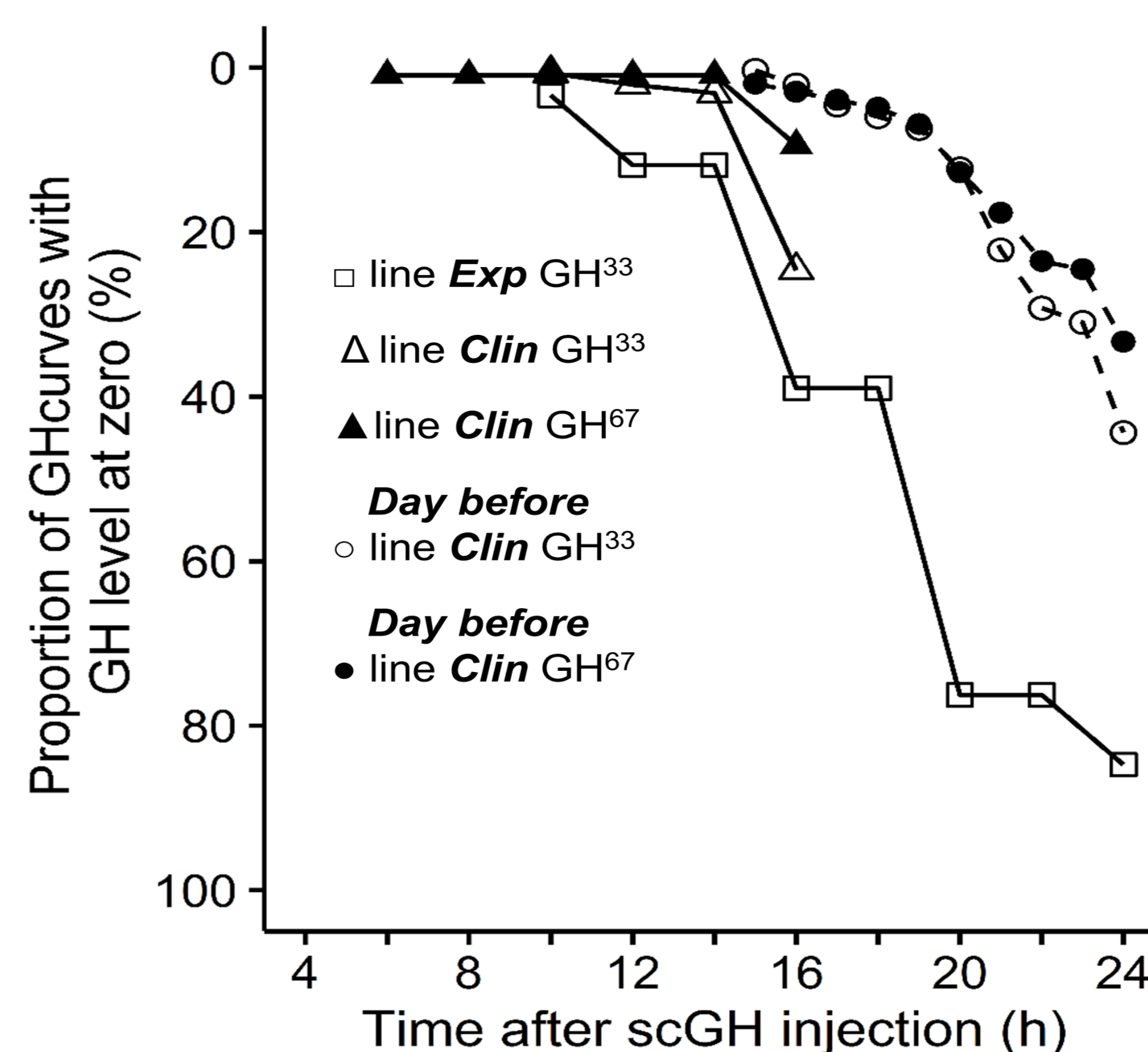Results presented as median (mU/L) and inter-individual variation (CV%)

Total group: C_{max} 71(44) and AUC 534(42).
GH-dose-dependency for GH[33] vs GH[67] was found
for C_{max} 63(31) vs 103(32), p<0.001;
for AUC 464(29) vs 865(29), p<0.001.

GH-curves (%) coming back to zero-level

Experimental-setting (□ line) 85% of GH-curves reached zero-level within 24h after the injection.
Clinical-setting, day before: 43% of GH-curves (○ line) in GH[33] and 33% (● line) in GH[67] reached zero-level after 24h.
Clinical-setting, 25% of GH-curves (Δ line) in GH[33] and 11% (▲ line) in GH[67] reached zero level at 16h.

Study design
GH-curves from the children who were followed yearly with GH-curves for up to 8 years after GH-dose 33 (GH[33]) or 67 (GH[67]) µg/kg/d, given as a sc injection at 90° angle in the thigh, using a 12mm needle.

Experimental-setting (59 GH-curves from 15 children, diagnose MPHD), GH[33], concentration 4 or 16IU/ml, given by a nurse at 09:00, blood samples were drawn every 30 min until 6h and thereafter every 2h until 24h after the injection.
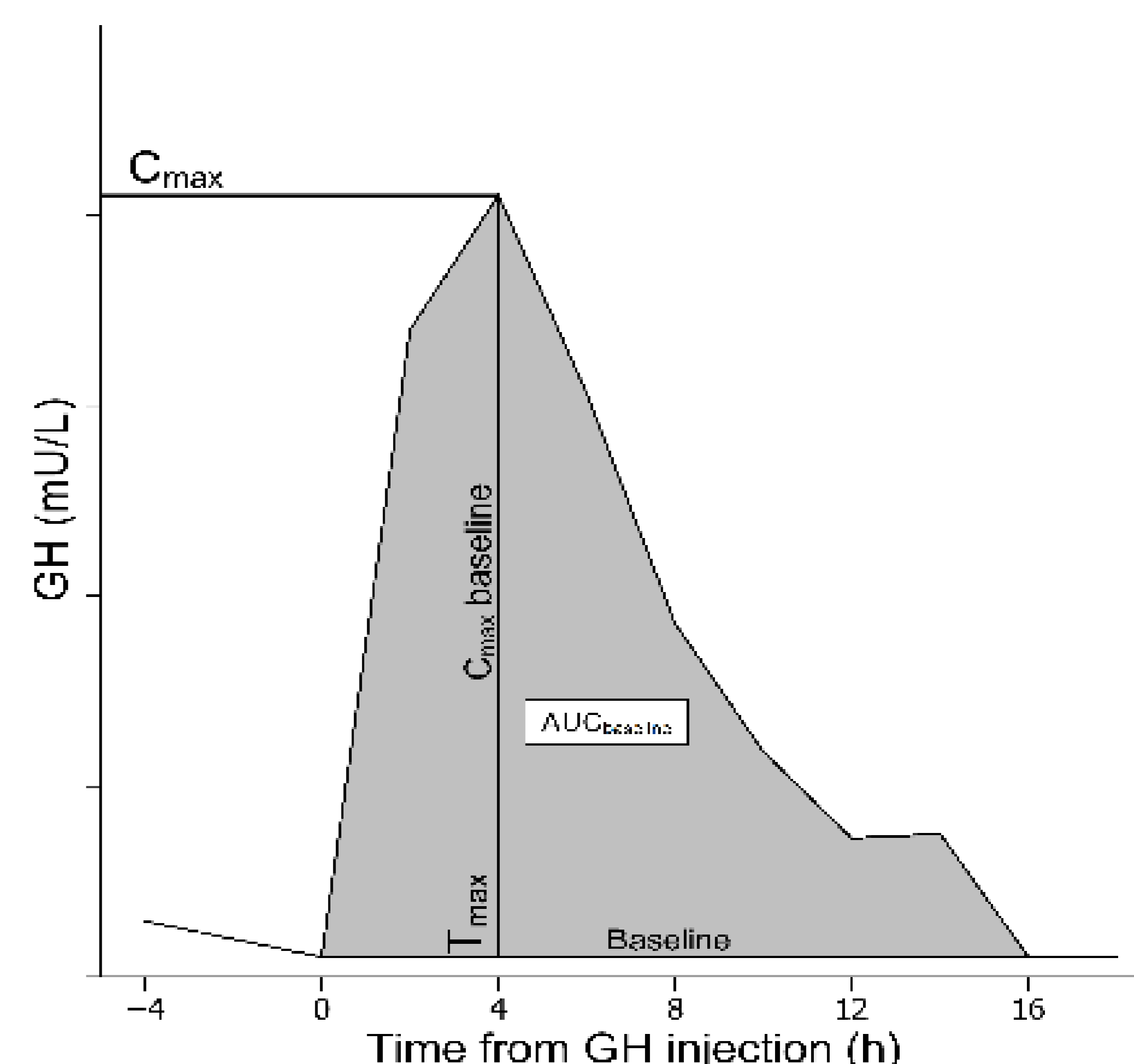
Clinical-setting (429 GH-curves from 117 children, diagnose IGHD/ISS), GH[33] or [67], injected by the patient at 18:00, blood samples were drawn every 2h until 16h after the injection. Time for the previous injection the *day before* was reported by the patient.

Diclosure: EL,BA, SR, KAW has nothing to declare; BK has received consultant honoraria from Pfizer.

Study population
Age and height for boys *(left)* and girls *(right)* at their yearly visit for GH-curves.
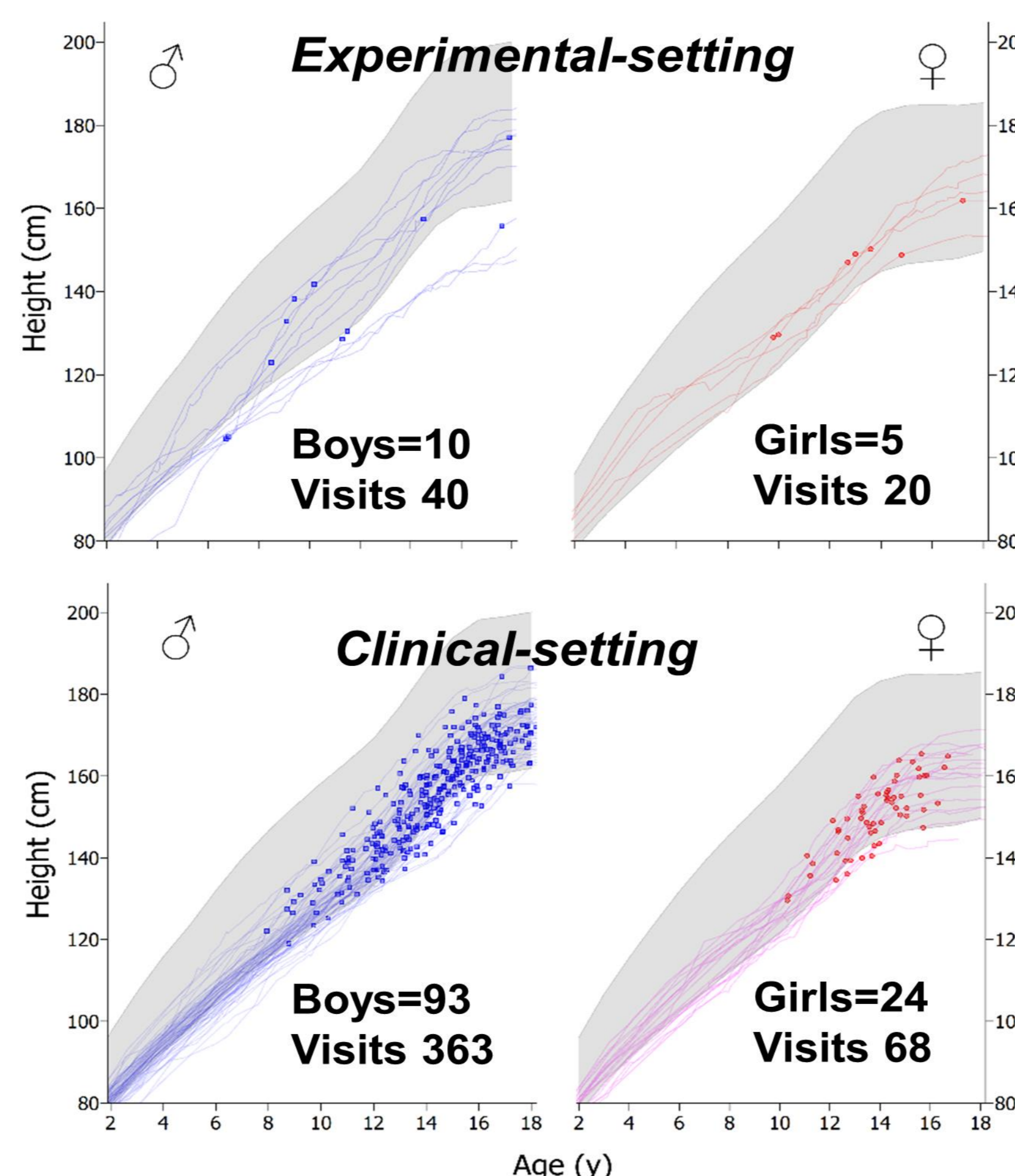
Methods
GH was analysed by Pharmacia Polyclonal assay, IRP 80-505. Pharmacokinetics was estimated by time, Tmax(h); at max GH concentration/level, Cmax(mU/L) and area under the curve, AUC(mU/L).

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