Reviewer's report

Title: Prediction models for short children born small for gestational age (SGA) covering the total growth phase. Analyses based on data from KIGS (Pfizer International Growth Database)

Version: 1 Date: 18 January 2011

Reviewer: Maria de Ridder

Reviewer's report:

- General

This paper reports a new prediction model for short SGA children threatened with growth hormone, to predict growth in the third year of threatment. Combined with existing models, which are evaluated in this paper, a set of prediction models covering the total growth phase of the children is presented.

- Major Compulsory Revisions

In an evaluation of prediction models in new, independent data, there should be given more information than only the mean of the residuals. It would be very interesting to see the performance (R2) of het model in the new group and whether the relation between predicted and observed values follows the line of identity. The latter can also be shown by checking whether the distribution of residuals is unrelated to the predictive values, as done in Figure 1e. It should be tested whether the decreasing pattern in this plot is significant.

- Minor Essential Revisions

Abstract is lacking.

The structure of Methods paragraph is not clear, partially due to formatting of the headings.

Results:

All reported 'predicted height velocities' have the wrong unit.

Results of response first year:

It is not clear which test is reported in the last sentence. To compare predicted HV of the modelling and the evaluation group would be irrelevant. The subjects in the evaluation group must meet the criteria to apply the model, but mean values do not have to be comparable.

Why is noted p < 0.05 here, in contrast to in the Statistical paragraph: level p < 0.01?

There are several inconsistencies between values in tables and text:
Standard deviations of SR 2nd year, of start height SDS in 3rd year and 4th year. Percentage of boys in 4th year.

In the text there is not any reference to the figures.

It is not clear which is the correct reference for the TPG-model: is it [5] or [34]?

- Discretionary Revisions

Compared to the descriptives given for the "first 4 year" groups, the information about the TPG-group is very limited.

It would be respectable if Table 3 is presented as an overview of the now available models, with references to the papers in which they are published before. One of the contributions added by the present paper could be to state the R2 and Error SD that are obtained now by using new data.

Discussion:
How is the comparison between fourth year growth and spontaneous normal growth done?

Presenting all plots using the same scales for the axes is not desirable in this case, while the range of HV in successive years is nog comparable.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**
I declare that I have no competing interests.