Reviewer's report

Title: A new growth chart for preterm babies: Babson and Benda's chart updated with recent data and a new format

Version: 2 Date: 27 August 2003

Reviewer: Gerd G Schmalisch

Reviewer's report:

General
Growth charts are an essential tool in developmental medicine for clinical and research purposes. A continuous update of the charts is necessary to describe the current population and to consider improvements in medical and nutritional care. This is particularly important for the widely used Babson and Benda's charts. Some measurements were 15 years old at time of publication and were now about 40 years old. The calculation of new growth percentiles is very time consuming and needs large sample sizes particularly for nonparametric estimation of the percentiles. In the submitted paper Fenton describes a more simple technique to develop fetal-infant growth charts using a meta analysis of published reference studies. However this technique has severe methodological limitations which should be discussed carefully:

Major Points:
1. From the statistical point of view it is absolutely correct that the larger the sample size the better the confidence in the extremes provided that there is a homogeneous population (page 2). In this meta analysis infants from Canada, USA, Sweden and Australia were pooled. Is this still a homogeneous population?
2. The distribution of the body weight and length for each gestational age can commonly not be described by simple parametric models (e.g. normal distribution) so that the percentiles must be determined non-parametrically from a large number of infants (i.e. more than 100 for each gestational age to calculate the 3rd or 97th percentile). In this study the percentiles were calculated by weighted averaging of published percentiles (see page 6). This is a very rough estimate of the exact percentiles of the pooled population.
3. The total sample size of the single studies does not give any information about the number infants in the different age groups particularly in the upper and lower percentile range. Therefore the possibilities of an weighted averaging to consider different sample sizes are limited.
4. Intrauterine and postnatal growth differs significantly (not only the weight loss after birth), and it is hardly believable that there must be a simple transition from fetal to postnatal growth charts (e.g. Niklasson A. et al. Pediat. Res. 2003).
5. Figure 3 illustrates clearly that the pooling of data of different populations can lead to large deviations in the percentiles mainly in the extremes. It is doubtful that in this case the smoothing of the 3rd and 10th percentile using both data improves the accuracy of the weight distribution. The aim of this study was the development of continuous growth charts from the 22weeks to 50 weeks for monitoring purposes. However the used technique of smoothing of different published curves can significantly affect the accuracy to describe the weight distribution of a specific population.

Generally, a meta analysis can not replace a prospective reference study. Some problems of a retrospective data analysis are discussed in the paper (e.g. unequal handling of outliers, differences in the definition of gestational age and the patient enrolment). Nevertheless, the technique used by Fenton is a simple way to get information about the growth in the perinatal period. Despite of the high number of enrolled patients in such a meta analysis the accuracy of the developed curves will
be limited due to the methodological limitations of a meta analysis. A validation of the developed growth charts is only possible by using of a new population of healthy infants and to check their distribution in the charts.

Minor Points:
1. Abstract, line 6: "….based on larger sample sizes…" is only partly true and misleading. In would be better to write: "…. based on a meta analysis of published reference studies"
2. Fig. 1 and 2 are not necessary for this study.
3. The comparison of the new charts with Babson and Benda's charts is very detailed and can be reduced (either Table 1-3 or Figure 5).
4. Legend of Table 4 is difficult to understand, please describe the content more clearly
5. Please review the manuscript carefully because there are many misspellings (e.g. page 9 line 10).

Advice on publication: Accept after minor compulsory revisions

Level of interest: A paper whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Declaration of competing interests: None