Reviewer's report

Title: Comparing the growth of preterm infants through the gestational period of 37 to 50 weeks with the reference fetus

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Reviewer: shripa rao

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The authors have compared the postnatal physical growth of a large sample of preterm infants (born at 23-31 weeks gestation; between 2001 and 2010) to the new (to be published) Fetal-Infant growth reference charts (Fenton 2012). They also have identified secular trends in the postnatal growth of preterm infants by comparing the data from study population to those born between 1994 and 1995 (NICHD).

Their main findings were
a. The median weight growth curves of the preterm infants remained between the 3rd and the 50th percentiles of the FIGR from birth through 10 weeks post term.
b. Immediately after birth, preterm infants grew more slowly than the fetus
c. Preterm infants grew more rapidly than the fetus between 37-40 weeks PCA.
d. Preterm infants born in 2001-2010 had better growth velocities compared to those born in 1994-1995.

Major essential revisions:

1. Certain paragraphs in the manuscript will need to be reworded to make it easily understandable to clinicians.
   Eg:
   Introduction, paragraph 5:
   “The objective of this study was to observe weight gain patterns of preterm infants and to compare this growth with a meta-analysis estimate of fetal and infant growth, to inform the revision of the Fenton growth chart”.
   The meaning of this sentence is unclear to me. “To inform the revision of the Fenton growth chart” needs to be deleted from this sentence.

2. Introduction, paragraph 5:
   “We expected the growth during the initial postnatal period to be inferior compared to the fetus, and the period between 37 and 40 weeks to be superior since the growth of preterm infants is not constrained by the placenta at this latter age”. This is the author’s hypothesis and hence does not fit well here in the objectives section. Also the sentence is a bit difficult to understand at this stage of the manuscript.
3. Methods, first paragraph: “For the purposes of comparison for this study, a fetal-infant growth reference (FIGR) was generated based on a systematic review of the literature”.

If the FIGR was generated for the purposes of this study, the authors will need to give more details of the FIGR. If not, they could say we compared the postnatal growth of preterm infants born in three North American units to the “to be published FIGR” and quote ref 21 and describe briefly the updated FIGR.

4. Methods section, second paragraph:
Please add details of feeding practices of these units (enteral and parenteral, such as dose and type of amino-acids and lipids, rate of increment, enteral feeding, fortification etc).

5. Results, first paragraph:
“The infants in the oldest gestational age category had a high rate of small size for gestational age and a low rate of being large for gestational age, likely since the entrance criteria for post-discharge follow-up in Calgary favoured infants less than 1250 grams at birth”.

The authors need to point out the limitations of the retrospective nature of their study in the discussion.

6. Results, paragraph 2:
“The median weight growth curves of the preterm infants in this study superimposed on the FIGR curves generally placed between the 3rd and the 50th percentiles (Figure 1)”.

The authors could discuss the possible reasons behind the fact that even though growth velocities were better than FIGR, still the postnatal weights were below the 50 centiles of the FIGR.

7. Tables:
Table 2: Please mention stage of NEC. I suppose they were #stage 2 NEC. Please give the definition of bronchopulmonary dysplasia
Table 3 missing. I think there are only four tables and they need to be rearranged.
Table 4: Weight z--scores and percent of “study” infants weighting less than the 10th percentile.
Table 5: The plus minus symbols need to be carefully observed and rewritten where needed.

Eg: while comparing the growth velocity between 40-50 weeks with the FIGR, the study infants had higher growth velocities than FIGR, but the differences are written with a minus symbol. They should carry a plus symbol.

While comparing the growth velocity between 40-50 weeks with the WHO growth standards, the study infants had slower velocity compared to fetal infant estimate, but the differences are not written with a minus symbol.
8. Figures:
All figures need title, legend and a brief interpretation. At present, it is not clear what the percentiles on FIGR are. Is it 97, 50 and 10?
Legend for figure 1:
Median growth patterns of the 24 (dot), 27 (dash), and 30 (dash dot) week preterm infants superimposed on the Fetal-Infant Growth Reference, “which was based on a 6 country meta-analysis of intrauterine growth (22 to 40 weeks) and the World Health Organization Growth Standard (40 to 50 weeks)” can be deleted.
Same for figure 4 legend.
Minor essential revisions:
1. Page 4, second paragraph: line 3: daily weight for first 21 “days”
2. In some places it has been labelled as 7 country metaanalysis
Discretionary revisions:
1. Out of interest, does the FIGR need to have separate charts for males and females? This is purely for my understanding of the subject rather than suggestion to the authors. The WHO 2006 has separate charts for males and females.
2. Methods section, second paragraph:
“These neonatal units have provided early nutrition support (parenteral nutrition started on the birth day or day one of life for most of these infants) since 2005”. It will be interesting to see if the cohort of infants born between 2005 and 2010 had better growth velocities compared to the cohort before 2005. The authors may want to consider it for future if not for this publication.
3. Tables: Instead of calling it as “6 country meta-analysis”, it is better called as FIGR-2012.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

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