Reviewer’s report

Title: Association between Pre- and Postnatal Growth and Longitudinal Trends in Serum Uric Acid Levels and Blood Pressure in Children aged 3 to 7 years

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Reviewer: Kei Lui

Reviewer's report:

The manuscript is interesting and will be an original contribution to literature.

This is a cohort study of 365 children from the Ewha Birth and Growth Cohort assessed the effects of pre- and postnatal growth status on serum uric acid levels at 3, 5, and 7 years of age. Preterm birth was defined as birth earlier than 37 gestational weeks. LBW was defined as a birth weight of less than 2.5 kg. Catch-up growth was defined as a change in weight (between birth and age 3) by a z-score > 0.67 for LBW subjects. (ref Martin A Matern Child Nutr. 2017)

There were 309 (85%) NBW control children, 20 (5%) LBW at-term children who experienced catch-up growth, and 36 (10%) premature LBW children who experienced catch-up growth.

Are there any LBW children without catch up growth? There appear no LBW term or preterm group without catch up growth included for comparison. Hence any difference found could be related to LBW/Preterm rather than due to having catch-up growth as speculated. In the LBW-preterm group, how many would remain LBW at full term equivalent (corrected to EDC)? Should they be considered as preterm and "NBW corrected for prematurity"?

The number of children followed up at 5 years was 188 (NBW: 166, LBWCUG: 22), and the number followed up at 7 years was (NBW: 145, LBWCUG: 17) vs the initial age 3 year cohort of 375 (NBW:309, LBWCUG: 56). LBWCUG is a combined investigation group of LBW-term and LBW-preterm infants. The number for each subgroup at follow up would likely be small due to a high loss rate in follow up. Nonetheless, this should be declared that the reader could at least know if there was over-representation of one subgroup at each follow up age. Table 1 could be reformatted to include more data on the group numbers to clarify. Table 1 in the current form could give the impression that there were 309 NBW and 56 LBWCUG children through to 7 years of age (though noted in the table footnotes).

Table 2 shows the LSM from the modelling adjusted for sex, GA and MBI at age of uric acid measurement. I suggest to include the raw data with mean, SD/range as the top panel and LSM below for readers to compare and understand the differences before and after the adjustment. It was noted that "when modelled without adjustment, LBWCUG children and consistently higher SUA levels between 3 and 7 years of age (p-0.031 and 0.027)"

The investigators examined the LSM of SBP between 3 and 7 year of age based on the multivariable generalized linear model adjusted for sex, gestational age, and height, weight, and uric acid at 3 years of age, and found a higher SBP by 7.89 mmHg with borderline significance (p=0.082) in children who experienced low birth weight and catch-up growth compared with those who had a normal birth weight.
Should a sensitivity test with or without uric acid be performed as uric acid is associated with SBP. In Model 1 (Table 3), results were adjusted for height and weight at baseline but not with sex and gestation. Again, it would be desirable to include the raw data in table 3.

Figure 1 shows the uric acid trajectories from age 3 to 7. The plots are from the estimated LSM. Again it would be important to know the data breakdown of the age 5 and 7 LBSUCG to give confidence of the plot b regarding the 20 term LBW with catch up growth.

Overall, the manuscript is an interesting exploration of the hypothesis linking LBW, Preterm, Catch up growth, Uric Acid and SBP. More information regarding the subgroups are important. Some of the subgroup results and analysis could be included as on-line material. There is no comparison group without catch up growth. It is difficult to accept and attribute the observed changes to a contributing factor of catch up growth as speculated. All observed changes may be just associated with being LBW.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
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No

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