Reviewer’s report

Title: Customized versus population birth weight charts for identification of newborns at risk of long-term adverse cardio-metabolic and respiratory outcomes: A population-based prospective cohort study

Version: 0 Date: 29 Jul 2019

Reviewer: Nansi S. Boghossian

Reviewer's report:

In this paper, the authors examined the association between SGA and LGA defined by using population or customized charts and adverse outcomes at 10 years. The authors report that the direction and strength of the associations were similar when using either population or customized charts. Overall the paper is well written. Below are some comments:

- The majority of the studies that use population based charts are sex-specific birth weight for gestational age. Are the population based charts used in this study also sex-specific? If not why did not the authors consider examining sex specific charts?

- Statistical analyses section. Prevalence of adverse outcomes within each gestational age adjusted birth weight category by dividing the cases by the number of newborns in each birth weight category. Do the authors mean here the prevalence of outcomes among SGA, AGA, and LGA infants as reported in Figure 1?

- Table 3 can be presented as a supplementary table and Fig S2 as a main figure.

- Results page 13 line 222. All the reported ORs are non-significant. The authors mentioned higher risk of childhood overweight (OR 1.24, 95% CI: 0.95-1.60), hyperlipidemia (OR 1.25; 95% CI: 0.88-1.79) and liver steatosis (OR 1.77; 95% CI 0.88-3.54) but these are non-significant ORs. Please revise this section.

- The authors mention in the results section that repeating the analyses among newborns classified SGA or LGA by customized or population charts only (page 13 line 227) results in similar findings. However, in the discussion section lines 268-270, they report that infants classified by customized charts only did have higher risks...Please correct this discrepancy when reporting the results.

- Discussion section page 15, line 277, please provide the reference.

- The main idea behind this study is whether one chart is more predictive of adverse outcomes compared to the other chart used. However, the approach used in this study, i.e. examining strength of associations, does not provide the full picture to suggest using one chart versus the other. Additional results need to be presented, examining ROC curve analyses to assess the
predictive power of either chart for long term adverse outcomes. Please refer to this reference: Pepe MS, Janes H, Longton G, Leisenring W, Newcomb P. Limitations of the odds ratio in gauging the performance of a diagnostic, prognostic, or screening marker. Am J Epidemiol 2004;159:882-90. The conclusions are likely to be similar given the small reported ORs.

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

No

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

Not applicable

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

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