Reviewer's report

Title: Joint association between birth weight at term and later life adherence to a healthy lifestyle with risk of hypertension: A prospective cohort study

Version: 1 Date: 8 March 2015

Reviewer: Karien Stronks

Reviewer's report:

This is an interesting paper on the joined influence of low birth weight and and unhealthy lifestyle in adult life, on risk of hypertension in later life. Based on data from the Nurses Health Study II, the authors show that the combined risk of hypertension due to a low birth weight at term and unhealthy lifestyle factors is larger than the sum of the parts, indicating an interaction on an additive scale.

1. Is the question posed by the authors new and well defined?
   Yes

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
   Yes, with a few questions:
   - Why have the authors made a contrast, in Table 4, between birth weight >= 2.5 kg, and all other categories, including the category >= 4.5 kg? The latter category has a reduced risk of hypertension according to Table 2, so would it not be logical to exclude that category from the reference group?
   - I was surprised to see use of nonnarcotic analgesics as a lifestyle factor – could the authors clarify this? I could also be an indicator of health problems.
   - What is the rationale for the categories in Table 4: why are the 3 healthy lifestyles DASH, exercise and analgesic use taken together, and alcohol and BMI added successively?

3. Are the data sound and well controlled?
   - The role of smoking is unclear to me. I agree with not including it as a lifestyle factor, but I do not understand why it is sometimes included as a confounder (Table 2 and 4), and sometimes not (Figure 1). In addition, I do not understand why it is mentioned as a lifestyle factor in the legenda for Table 3.
   - I was surprised to see that educational level (or another indicator of socio-economic position) had not been included as a confounder. See also comment below on unmeasured confounding.
   - Missing data: for a large number of women, data on lifestyle and birth weight was missing. How could this have affected the conclusions?
   - I did not feel competent to judge the statistical analyses used to test for (additive) interaction. This needs to be checked by a statistician.
4. Do the figures appear to be genuine, i.e. without evidence of manipulation?
Yes

5. Does the manuscript adhere to the relevant standards for reporting and data deposition?
Yes

6. Are the discussion and conclusions well balanced and adequately supported by the data?
- In the discussion and conclusions, the authors interpret low birth weight as a marker of fetal growth restriction. It seems to me, however, that it cannot be ruled out that the influence of low birth weight might also reflect other explanations, including a genetic risk of HT (in case low birth weight is driven by HT of the mother – probably not completely covered by family history of HT), shared environment (both mother of those with low birth weight as the women with low birth weight at adult aged exposed to e.g. stress, e.g. as a result of unemployment), or unmeasured confounding (see also previous comment on educational level). I would expect the authors to discuss these alternative explanations in the discussion section.

- The group of people with the lowest risk of HT is extremely small (Table 4: birth weight >= 2.5 kg, and adherent to all healthy lifestyle factors). This raises doubts as to how realistic the estimated PARs are. In my view, the authors need to comment on this in the discussion section, in particular in view of their conclusion that the majority of cases of hypertension could be prevented by the adoption of a healthier lifestyle.

- Generalizability: how generalizable are the results to the population as a whole, given changing percentages of children with low birth weight over time? I would expect the authors to discuss this.

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

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