Reviewer's report

Title: Repeated measures of inflammation, blood pressure, and heart rate variability associated with traffic exposures in healthy adults

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Reviewer: Scott Weichenthal

Reviewer's report:

The authors conducted a repeated measures study among healthy adults exposed to varying levels of traffic pollution by walking along roadways with varying traffic characteristics. Personal air pollution exposures were measured during each walking route and a variety of health measures were collected before, immediately after, and 24-hours after exposure. Health effects were examined treating "site" as an exposure as well as for individual pollutants. This study is somewhat limited by a small sample of 23 subjects and it appears that many of the findings were sensitive to responses in 2 obese subjects. Overall, the paper is well written and the comments below may be helpful.

Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)
- It would be helpful to include overall exposure means in Table 3 along with the site specific values.
- I am not sure I agree with including an indicator variables for location in the mixed models, this is essentially putting the exposure in the model twice and likely diluted the air pollutant effects. Perhaps models with and without these indicator variables could be shown? Alternatively, the authors could look at linear models within sites if they are worried about confounding by site specific factors and verify that within-site effects are similar to the overall effect.
- Did the authors consider heart rate during exercise as a covariate? This may be used to account for potential differences in exercise intensity, and thus dose, between visits.
- The authors should explore the use of regional air quality data for NO2 and O3 since their portable monitor was not capable of measuring concentrations at the selected sites.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
- The authors should show the effect estimates after the 2 obese subjects were removed, the additional files are difficult to go through and most readers won’t bother.
- The findings of decreased blood pressure but increased LF:HF seems odd as increased sympathetic modulation would tend to increase blood pressure. This
should be discussed.

Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore.

- It would be interesting to examine potential non-linearity in the relationship between air pollution and HRV and Blood pressure. In our own work, we are seeing that decreases in HRV occur at lower exposure levels and flatten off as exposure increases. It may be worth examining this. Also, we recently observed that regional air pollution concentrations immediately preceeding exposure days modifies the effects of traffic pollution on HRV. It might also be interesting to explore this possibility (Part Fibre Toxicol. 2014 Dec 9;11(1):70 )

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

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

Declaration of competing interests:

None