

Reviewer's report

Title: Study of heart rate variability among Nunavik Inuit adults exposed to environmental mercury.

Version: 1 **Date:** 8 October 2007

Reviewer: Katsuyuki Murata

Reviewer's report:

General

Authors measured heart rate variability (HRV), as well as n-3 fatty acid (DHA and EPA), insulin sensitivity (HOMA-IR), selenium, age, and gender, among Nunavik Inuit adults aged 40-73 years, and they concluded that no impact of mercury blood concentrations on HRV was detected in this adult population after taking into account confounding factors, although they found two significant correlations between mercury and both low frequency (LF) and standard deviation (SDNN) of ECG R-R intervals in the data analysis with use of the simple correlation coefficient.

This manuscript should probably be published in the Environmental Health. However, it seems that this manuscript has some minor essential revisions to be rewritten or inserted.

1. In the 'Methodology' section, authors should describe the company name and the sampling time of their R-R interval analyzer, because the sampling time (e.g., 1 ms, 2 ms, 3.3 ms, or ...) may come into technical question in the future.
2. Please describe how ECG R-R intervals were measured in Nunavik Inuit adults, using a 2-hour Holter monitoring. For example, were the study subjects working when measuring the ECG? If so, the HRV parameters may reflect the acute effect on the autonomic nervous system. Also, in which way did authors select "R-R intervals calculated over 5-minute periods" from the 2-hour Holter monitoring data?
3. Most of HRV parameters depend on aging, especially in adults. For this reason, age should be used as an inevitable confounder in data analysis of HRV parameters. Nevertheless, the authors did not partly use age by using the downward-stepwise regression analysis in Table 3.
4. Since authors used partial R² in Table 4, readers do not know which of the positive and negative correlations each independent variable had with outcome variables.
5. In Table 4, the p-value of HOMA-IR exceeds 0.05; for this reason, it is not the confounding factor that explains a significant proportion of the variance. Because, authors state "A p<0.05 was considered of statistical significance" in the 'Methodology' section. At least, authors should preserve internal consistency

in the manuscript.

6. In the third paragraph of the 'Discussion' (or the 'Conclusions') section, what is the evidence that DHA and selenium are protective factors or confounders for the relationships between HRV parameters and mercury? Certainly, the authors described significant associations between mercury and both DHA and selenium, but Table 4 does not at all provide such evidence in the 'Results' section.

7. As one of some limitations in this study, blood mercury concentrations, as compared to hair mercury concentrations, may be easily changeable due to the volume and kinds of fish consumed and may not exactly reflect the mean exposure levels during the adult life; whereas, HRV parameters might reflect the chronic effect on the autonomic nervous system if ECG R-R intervals were recorded in a stationary state.

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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