Reviewer's report

Title: Is the impact of methylmercury and n-3 polyunsaturated long chain fatty acids on myocardial infarction risk modified by genetic polymorphisms in glutathione-related genes? A case-control study.

Version: 1 Date: 25 February 2011

Reviewer: Gunnar Nordberg

Reviewer's report:

Review of Ms MS ID : 1080832050490233 by Engstrom et al

Comments for authors and editor:

This is an interesting article dealing with mercury erythrocyte levels, n-3 polyunsaturated long chain fatty acids and myocardial infarction (MI) among cases and controls in North Sweden. However, it seems that the exposure to methyl mercury in this population group was not high enough to give rise to any impact on MI risk and it is therefore not surprising that the authors did not find any statistically significant modifying effect of genetic polymorphism in glutathione related genes. The observations of relationships (not statistically significant) between genotype and MI may still be of sufficient interest for publication provided the same observations have not previously been published in ref 7 by the same authors. The present reviewer would appreciate to receive the author’s comments on how the observations in the present manuscript differ from those published in ref 7.

Since there is no impact by mercury on MI at the dose level studied, it is not possible to relate such absent impact to any other observation. The present reviewer therefore suggests that the title of the paper be modified to remove this notion. A suggestion for a suitable title would be:“MI risk, ery-Hg, n3polyunsat long fatty acids and genetic polymorphism in glutathione-related genes – a case-control study.” But other titles may be equally adequate and the authors should feel free to modify their title as they wish.

Abstract:

The abstract should be modified to reflect the findings. In the conclusions section of the abstract, the word statistically should be added. “No statistically significant genetic modifying effects.......” The words “is necessary” are repeated twice in the last sentence, please remove.

Introduction:

The last paragraph of the introduction (page 5) should be modified to say that this study examined possible relationships between MI and the studied biomarkers without assuming an impact of MeHg on MI risk.

Methods:
Page 5: The study population should be better described and it should not be assumed that the reader knows the information in ref 5 (not complete in ref list – has it been published?). The same is true for the description of measurements on page 6.

Results:
In the first sentence of the results section (page 8) the authors state that the risk decreased with ery-Hg, however this decrease is not statistically significant and it is not causal, so it is suggested that this sentence is modified.

The statement on top of page 10 that ery-Hg has a true protective effect on MI risk should be modified. As far as the present reviewer understands, this effect is not statistically significant. It is highly likely that this observation is due to some kind of confounding and it is very unlikely (according to the present reviewer) that it would be causal because there is no support for a beneficial effect of mercury from other epidemiological or experimental evidence.

Acknowledgement may need editing

**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.

**Declaration of competing interests:**

No competing interests