Reviewer's report

Title: Mercury in human brain, blood, muscle and toenails in relation to exposure

Version: 1 Date: 15 August 2007

Reviewer: Pál Weihe

Reviewer's report:

General: This is a small study comprising autopsies of 30 deceased individuals at a hospital on the west coast of Norway. Tissues from occipital lobe, pituitary and thyroid glands, muscle, toenails and blood have been analyzed for mercury. It is noteworthy that hair has not been included in the analyses.

Correlation analyses showed significant correlation between MeHg in blood and occipital cortex. Moreover I-Hg in blood and occipital cortex, as well as total-Hg in pituitary and thyroid glands were associated with the number of dental amalgam surfaces at the time of death. However, the significant correlations was obtained after exclusion of a single outlier regarding the concentration of I-Hg in brain cortex. This outlier turned out to be a former dental assistant who should not have been included, since occupational exposure to mercury had been used as an exclusion criterion.

The paper assumes that the 30 deceased individual belonged to a fish consuming population and thus exposed to methylmercury. However, nothing is reported on how this was confirmed at an individual level.

It is stated that the samples from the hearth blood were highly inhomogeneous and were considered not possible to use. The blood sampled used were obtained from vene femoralis within three days post mortem. Since there is a big difference in the concentration of methylmercury in whole blood and serum/plasma, the state of coagulation of the sample is important.

Under “Conclusions” is stated that the correlation between total-mercury in toenails and methylmercury in brain \( r = 0.6 \) was “too low for being a useful biomarker for methylmercury in brain at an individual level” – without any previous discussion.

----------------------------------------------------------------------------------------------------------------------

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

----------------------------------------------------------------------------------------------------------------------

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
Discretionary Revisions (which the author can choose to ignore)
• If information on dietary habits are available in the hospital records they could be included in table 1 – e.g. seafood consumer yes/no
• An explanation why hair analysis was not included should be given.
• It should be explained if the remaining 29 deceased individual were re-checked for occupational mercury exposure as it was done with case # 28, when high mercury concentration was detected in the brain.
• It should be explained what is meant by “samples from heart blood were highly inhomogeneous”. It should be stated that this was not the case for the samples from vena femoralis and furthermore it should be stated that the whole blood samples from the vein were homogenized.
• The wording of the aim of the study in the abstract and in the section “Background” should be brought in accordance.
• The usefulness of total-mercury in toenails as a biomarker for methylmercury in brain should be discussed further.

What next?: Accept after discretionary revisions

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.