Reviewer's report

Title: Associations between cadmium exposure and neurocognitive test scores in a cross-sectional study of US adults

Version: 1 Date: 20 March 2012

Reviewer: Soisungwan Satarug

Reviewer's report:

In the manuscript, “Associations between cadmium exposure and neurocognitive test scores in a cross-sectional study of US adults”, authors examined the neurotoxic potential of exposure to cadmium in a representative sample of the U.S. adult population. Specifically, authors used multivariable-adjusted models to estimate associations of urinary cadmium and four neurotoxic outcome measures, obtained from 5572 participants, 20-59 years of age, in the National Health and Nutrition Examination Survey (NHANES III) 1988-1994 who underwent neurocognitive screening tests. This reviewer finds authors’ approaches to data analysis to be reasonably thorough and robust. However there are a few aspects need authors’ attention and clarification as detailed below.

In an introduction, authors mentioned food, tobacco smoke, and certain occupational environments to be cadmium exposure sources. How many subjects who were exposed to cadmium in the workplace? Would an association of cadmium and any of the four outcome measures be affected if occupationally exposed individuals were excluded or controlled for? What’s about the effects of co-exposure to other heavy metal, notably lead whose neurotoxic effects are particularly well documented.

Concerning dietary source for cadmium exposure, authors have provided in a discussion, EFSA and WHO urinary thresholds that should prevent kidney toxicity from occurring. It would be helpful to wide audiences, if these cadmium health risk assessment implications are mentioned upfront in an introduction as well. It should be noted however that these EFSA and WHO thresholds were based solely on dietary exposure or oral route exposure while the data from this study suggested that cadmium may be a mediator of neurotoxic effects of cigarette smoking. A strong argument then would come from evidence from non-smoking and non-occupationally exposed populations.

Cigarette smoking seemed to be an overstated source of cadmium exposure. A fall in exposure from cigarette smoke has been observed for the general population in the U.S., but evidence to suggest any changes in dietary exposure is lacking. Please see the paper, Reduction in cadmium exposure in the United States population, 1988-2008: The contribution of declining smoking rates by Tellez-Plaza et al. (EHP, 2012)
Level of interest: An article of importance in its field

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interest.