Neurobehavioural testing in workers occupationally exposed to lead

Whether or not low to modest levels of exposure to lead have a detrimental effect on cognition is an important issue given the growing attention, for example, in the United States, that has recently been paid towards potentially revising downward the levels of lead exposure allowed in the workplace. Thus, we read with interest the meta-analysis of studies on this topic that appeared in this journal by Goodman and colleagues. Unfortunately, we believe that the authors’ conclusions are not valid. Specifically, the authors state that “the data available to date are inconsistent and are unable to provide adequate information on the neurobehavioural effects of exposure to moderate blood concentrations of lead”. We found no direct support for this conclusion in the publication. Moreover, numerous flaws in their methodology limit any specific inferences that can be made. In general, we found that the meta-analysis combined evidence from studies of widely varying quality and did not account for significant confounding within and between studies. Given these and other factors, it is completely understandable that the authors did not find an association between blood lead levels and neurobehavioural test scores.

Specific concerns that we had with the meta-analysis include: (1) The authors offer no evaluation of the quality of the evidence from available studies based on study design and analytical method. (2) The authors combine data from poorly done studies with data from well-done studies, clouding any effects that are observable from the better conducted studies. (3) Although age and education adjustment within studies is assessed, six studies were included that did not adjust for age and another three studies did not adjust for education. These are the two most well-established predictors of neurobehavioural test scores and the most important potentially confounding variables. (4) Even among the remaining studies that did adjust for age and education, the authors do not address the confounding in the meta-analysis that is caused by variation in age and education across study populations. (5) The authors’ main effect measure is an exposed versus control comparison. Among the options that could have been pursued, this is the effect measure with the lowest power. It is unable to assess a dose-effect relation, and it is also the one most prone to selection bias. (6) Relatively few of the 22 studies listed in table 2 contribute to the effect estimate. For example, only including studies that reported beta coefficients for the blood lead versus test score relation, or adjusting for mean blood lead levels in exposed and non-exposed groups.

The editors will decide as before whether to also publish it in a future paper issue.

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References
Suicide mortality among electricians

Järnholm and Stenberg\(^1\) evaluated suicide mortality rates among electricians (“exposed to electromagnetic fields (EMFs)”) and glass and wood workers (“unexposed to EMFs”) in the Swedish construction industry. Standard mortality ratios were lower for the two job groups compared to the Swedish general population. This is likely to be due to the healthy worker effect. The internal cohort analysis showed that electricians had a lower suicide mortality rate than glass and wood workers.

As the authors rightfully point out, these results should not be seen as evidence against the association between exposure to EMFs and suicide, in particular because no quantitative estimates of exposure were obtained to directly evaluate this association. Järnholm and Stenberg cited a small measurement survey in the Swedish construction industry, which indicated that exposure levels were low and comparable between the two occupational groups. Therefore, one would not expect to see an EMF mediated increase in suicide risk among electricians compared to glass and wood workers, if an association between EMF exposure and suicide truly exists.

Järnholm and Stenberg suggested that the difference in suicide rate between the two job groups was unlikely to be due to differences in socioeconomic factors, but they did not provide an alternative explanation. One possible explanation may be a healthy worker survivor effect related to employment status (for example, at time of death) within this cohort. That is, active workers may be more physically and mentally fit than those who left the industry or are unemployed, and may therefore be at lower risk of committing suicide.\(^1\) A large body of literature suggests that unemployment and suicide are positively related, but being out of work was positively associated with longitudinal decline in cognitive function.\(^2\) As the authors correctly point out, the difference in suicide rate between electricians and glass workers could be an explanation.

We have no data on employment status at time of death and can therefore not test this hypothesis. However, if employment status is an important predictor, this could explain some of the difference, as the wood workers had a different employment structure to the other groups. Electricians and glass workers have had permanent positions for a long time, while wood workers were employed for a certain project, for example, building a house, before the 1990s. When the project was finished they had to find another employer. Today, most construction workers have permanent positions in Sweden.

In our search of the literature in an attempt to understand differences in suicide rates between occupations, we found little information. This might be an important area of research in the future.

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References


Authors’ reply

We appreciate Dr Wijngaarden’s interest in our report and his suggestion for understanding the differences in risk. Dr Wijngaarden suggests that difference in unemployment between electricians and glass workers and wood workers could be an explanation. We have no data on employment status at time of death and can therefore not test this hypothesis. However, if employment status is an important predictor, this could explain some of the difference, as the wood workers had a different employment structure to the other groups. Electricians and glass workers have had permanent positions for a long time, while wood workers were employed for a certain project, for example, building a house, before the 1990s. When the project was finished they had to find another employer. Today, most construction workers have permanent positions in Sweden.

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Important: The information provided in this document is for educational purposes only and should not be used as a substitute for professional medical advice. Always consult with a qualified healthcare provider.

Are inominator workers exposed to PCDDs and PCDFs?

Kumagai and his colleagues\(^1\) have reported that inominator workers employed at intermittently burning municipal waste incinerators in Japan. Occup Environ Med 2002;59:362–8.

evidence of higher occupational exposures. If they had used work intensity as a more objective criterion than age, they might have prevented possible misclassifications by age. Working conditions of hairdressers and exposures depend on country and regional variability, which might also affect study results. In the United States and United Kingdom, the term “hairdressers” is inclusive, denoting women’s hairdressers and barbers for men. In Turkey, however, the term addresses women’s hair salons only. Most of the studies on hairdressers have been published from Nordic and industrialised countries. Studies from developing countries will help to describe the extent of occupational health problems among hairdressers and to identify aetiologic factors.

References
6 Occupational exposures of hairdressers and barbers and personal use of hair colorants, some hair dyestuffs, cosmetic colorants, industrial dyestuffs and aromatic amines. IARC monographs on evaluation of carcinogenic risks to human 1993;57:43–66.