Preventing occupational ill health in the construction industry

D Snashall

Commentary on the paper by de Boer *et al* (see page 792)

Construction is big business. In the UK it is now the country's biggest industry and the same is true for many economically developed countries. It is also a dangerous business and construction workers do not enjoy good health: studies in Britain, Europe and the USA have shown that construction workers have high overall mortality rates independent of social class—both those employed in specific trades and “construction workers not otherwise classified”. There are increased mortality risks for all malignant neoplasms including lungs, stomach and thyroid gland, high levels of mesothelioma deaths, chronic obstructive pulmonary disease and high rates of transportation and other injuries. Psychological ill health is also common with high rates of alcohol and drug abuse. Construction used to be a young man's industry because of the high attrition rate resulting from poor work conditions and premature ill health and disability. Now, as with other industries, the workforce is getting older. Unlike other industries, the work cannot be exported.

The last decade has seen an explosion of interest in the construction industry and its hazards¹ but most of the literature is shot through with expressions of concern and frustration at the very nature of the industry and the people who work in it mitigating against improvements in occupational health. One of the main problems faced by the industry is how to retain early aging workers and provide meaningful work for them. The paper by de Boer *et al*² has tried to address this knotty problem by instituting counselling and education programmes using a case-control approach. They selected employees with a high risk of disability of 38% or more anticipated in the succeeding four years. These employees were assessed using the Workability Index, given a health education programme and then followed up at 9, 18 and 26 months after the start of the intervention. The rates of disability pensions granted were also recorded. The control group were offered occupational health “care as usual”,

which apparently incorporates voluntary periodic health examinations every 2–5 years depending on age. The study was done in the Netherlands. It should be noted that in other countries, including Britain, occupational health “care as usual” means, generally, no care.

The authors clearly found difficulties (there are always difficulties) in this intervention study and the process and the reasons why it was difficult are covered in their discussion at the end of the paper. There were problems in recruiting for the study: they had hoped that the majority of participants would be selected on the grounds of their potential disability by an occupational physician, but in fact a large proportion of the participants enrolled themselves in the programme. Then a number (57%) did not accomplish the programme for various reasons. It is speculated that some of them might have left because the assessment of workability which was performed did not please them because it prompted a realisation of the tenuousness of their position in the labour market.

The intervention was generally not successful. Any improvement in workability in the intervention group was minimal and the effect on the likelihood of receiving a disability pension was no different to that of the control group. The authors cite many reasons for the apparent failure of this health educative intervention: maybe it was pitched at the wrong level; maybe at 38% the workers were too far down the road of ill health and reduced workability. Perhaps health education does not work (although the intervention group reported more job satisfaction) or perhaps construction workers are simply a recalcitrant bunch of human beings different from other kinds of workers. There is some evidence of this—construction is notoriously a “fall back” occupation, levels of education are not high in general, and the work is by its very nature transient and attracts drifters and migrants and people avoiding the authorities. Actually in this study a majority of the construction workers were carpenters

or bricklayers and, as mentioned already, self-selected—probably a more stable group than the average. Another explanation not given by the authors might be that these employees were already receiving reasonably effective occupational health care.

Does this mean that assessment and health education to groups of workers with already existing disabilities (or at least workability scores over 38%) cannot prevent functional decline or prolong disability-free working life and loss to the industry? Well, the authors seem to be saying, at least in the circumstances they describe, “yes”.

Occupational safety in the construction industry has improved over the years as evidenced by many countries' national statistics reporting systems and this has been achieved by a combination of better and safer design of new buildings and structures, permits to work safely as used in the process construction industry (oil and gas etc) attention to ergonomics (manual handling and work in awkward spaces) and strong inspection and enforcement activities instituted by the state. Better control of hazardous substances and dust has also been achieved. These improvements have been more notable in the larger, well organised companies and less so in the small companies in which many construction workers work and in the demolition/renovation industry.

These have largely been employer-led initiatives stimulated by the shameful health and safety record beginning to be recognised in the early 1980s, forceful targeting by national labour inspectorates and concerns expressed by trade unions and occupational health and safety professionals. The workforce itself—poorly unionised, incoherent and generally poorly informed—has been quite well served in some countries by occupational health services (Bygghälsan in Sweden, in its heyday, was one of the notable pioneers), but occupational health provision to construction workers remains extremely patchy throughout the economically developed world and practically non-existent in the developing world. Whether interventions of this kind done in precisely this way and with this particular workforce will work to reduce disability and prolong active work life is still open to question and of course to further research.

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Correspondence to: Dr D Snashall, Occupational Health Department, Gassiot House, Guy's & St Thomas' NHS Foundation Trust, London SE1 7EH, UK; david.snashall@gstf.nhs.uk

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REFERENCES

- 1 van Duivenbooden C, Frings-Dresen MHW, Ringen K. Construction workers and occupational health care. *Scand J Work Environ Health* 2005;**31**(Suppl 2):3–4.
- 2 de Boer AGEM, Burdorf A, van Duivenbooden C, et al. The effect of individual counselling and

education on work ability and disability pension: a prospective intervention study in the construction industry. *Occup Environ Med* 2007;**64**:792–7.

Magnetic fields

Occupational exposures to magnetic fields and neurodegenerative disease risks

H Checkoway

Commentary on the paper by Sorahan and Kheifets (see page 820)

Collectively, the major neurodegenerative diseases—Alzheimer's disease, Parkinson's disease and motor neurone disease—represent a substantial public health burden throughout the world. The vast majority of cases of these disorders are non-familial. Thus, if only by default, it can reasonably be assumed that lifestyle and environmental factors are aetiologically relevant. Unfortunately, epidemiological research has yielded very few clues regarding modifiable risk factors.

During the past 20 years, there have been numerous epidemiological studies that have examined risks for these disorders in relation to aspects of electrical work: electric shocks and magnetic fields. These studies have been of various designs, including population-based case-control studies, follow-up studies of defined occupational cohorts, population-wide census linkage studies, and death certificate surveys. The pattern of evidence that has emerged can best be characterised as mixed, and at most suggestive of aetiological associations. To date, the most consistent results have been observed for electric shocks and magnetic fields with increased risks for amyotrophic lateral sclerosis, the main form of motor neurone disease.¹ However, the evidence is by no means compelling.

In this issue, Sorahan and Kheifets² report findings from a very large, rigorously conducted mortality study of Alzheimer's, Parkinson's and motor neurone disease in a cohort of UK electricity generation and transmission workers for whom quantitative magnetic field exposures were reconstructed (see page 820). The study generated mostly null findings, with the exception of a modest risk gradient for motor neurone disease mortality. Notwithstanding the rather unremarkable results, this study will be a

valuable contribution to the literature insofar as very prominent effects of magnetic field exposures on neurodegenerative disease risks can probably be discounted, at least in the population studied.

Considering the findings from the Sorahan and Kheifets study,² along with previously reported ambiguous results from other cohort studies that also had high quality, quantitative magnetic field exposure assessments,^{3–5} one might question whether this line of research deserves further pursuit. In spite of a fairly low "signal" for an effect of magnetic fields on risks for the neurodegenerative diseases, there is a good rationale for continued investigation. Even small excess risks posed by magnetic field exposures, which are ubiquitous in workplace and residential environments, could have substantial public health significance. Recognition that there is some epidemiological evidence, albeit inconsistent, supporting associations with Alzheimer's disease and amyotrophic lateral sclerosis, also argues in favour of continued investigation, rather than a conclusion that no meaningful aetiological relations exist or can be detected epidemiologically. Furthermore, it should be relatively cost efficient to extend the follow-up of existing cohorts to increase statistical power, which has generally been low because of the small numbers of cases. For example, only 218 of 21 888 total deaths in the Sorahan and Kheifets study were the result of Alzheimer's, Parkinson's and motor neurone disease combined.²

Arguably, the most fruitful further studies would be occupational cohort-based designs which generally offer considerably more detailed and precise exposure assessments than can be obtained in population-based case-control or other

studies. Future research will clearly benefit from improvements in the areas of exposure assessment for co-occurring occupational factors (such as electric shocks and chemicals), disease diagnostic accuracy, and controlling for potentially confounding non-occupational exposures. As Sorahan and Kheifets² acknowledge, their study, like nearly all occupational cohort studies, suffered from reliance on death certificates for disease outcome data. Missed cases and, more importantly, inaccurate diagnoses (especially for Alzheimer's and Parkinson's disease) may have undermined validity and precision somewhat. Confirming disease diagnoses and determining disease onset dates would greatly improve the quality of health outcome data, although obtaining necessary clinical and postmortem information may pose logistical challenges in some instances.

Based on the body of available literature, it seems likely that the magnitude of excess risk for Alzheimer's, Parkinson's, or motor neurone disease attributable to magnetic fields is probably small or, in the case of Parkinson's disease, perhaps nil. Consequently, potential confounding from occupational and non-occupational exposures would be of greater concern than is typically the case in occupational cohort studies. Control for carefully measured confounders would be necessary to avoid underestimating or missing associations with risk. Among non-occupational factors, cigarette smoking, which has a well-established inverse ("protective") association with Parkinson's disease,⁶ but has been related with increased risks for Alzheimer's disease⁷ and motor neurone disease,⁸ although somewhat inconsistently, is of particular concern as a potential confounder, if effect estimates for magnetic fields are assumed to be small.

There are some practical options that can be adopted in future research. Case-control or case-cohort designs nested within individual cohorts may be especially well suited for purposes of diagnostic confirmation and obtaining data on potential confounders. On a larger scale, meta-analyses and pooled analyses of multiple cohort studies (and nested studies within cohorts), applying common protocols for exposure assessment, disease outcome classification, and data analysis may be prove to be highly advantageous for increasing statistical power, assessing consistency of associations, and evaluating effect modification by gender and other factors. In fact, the cohorts need not be restricted to the conventional electrical industries. Data from other

industries that include large sectors of exposed workers, such as textile industry sewing machine operators,⁹ could also be incorporated into pooled studies. The relative strength and consistency of associations of occupational magnetic fields observed among different industries in various geographical locations would shed considerable light on whether these exposures contribute to risks for the major neurodegenerative diseases.

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Correspondence to: Professor H Checkoway, School of Public Health and Community Medicine, Department of Environmental Health,

Box 357234, University of Washington, Seattle, WA, USA; checko@u.washington.edu

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REFERENCES

- 1 Feychting M, Ahlbom A, Kheifets L. EMF and health. *Annu Rev Public Health* 2005;**26**:165–89.
- 2 Sorahan T, Kheifets L. Mortality from Alzheimer's, motor neurone and Parkinson's disease in relation to magnetic field exposure: findings from the study of UK electricity generation and transmission workers: 1973–2004. *Occup Environ Med* 2007;**64**:820–6.
- 3 Savitz DA, Checkoway H, Loomis DP. Magnetic field exposure and neurodegenerative disease among utility workers. *Epidemiology* 1998;**9**:398–404.
- 4 Johansen C, Olsen JH. Mortality from amyotrophic lateral sclerosis, other chronic disorders, and electric shocks among utility workers. *Am J Epidemiol* 1998;**148**:362–8.
- 5 Feychting M, Jonsson F, Pedersen N, *et al.* Occupational magnetic field exposure and neurodegenerative disease. *Epidemiology* 2003;**14**:413–19.
- 6 Hernan MA, Takkouche B, Caamano-Isorna F, *et al.* A meta-analysis of coffee drinking, cigarette smoking, and the risk of Parkinson's disease. *Ann Neurol* 2003;**52**:276–84.
- 7 Kukull WA. The association between smoking and Alzheimer's disease: effects of study design and bias. *Biol Psychiatry* 2001;**49**:194–9.
- 8 Weisskopf MG, McCullough ML, Calle EE, *et al.* Prospective study of cigarette smoking and amyotrophic lateral sclerosis. *Am J Epidemiol* 2004;**160**:26–33.
- 9 Szabo J, Mezei K, Thurucz G, *et al.* Occupational 50 Hz magnetic field exposure measurements among female sewing machine operators in Hungary. *Bioelectromagnetics* 2006;**27**:451–7.

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