Correspondence

Neurophysiological studies on workers exposed to lead

Sir,—Jeyaratnam and coworkers recommend, on the basis of the results of their neurophysiological study in 46 workers exposed to a combination of organic and inorganic lead, that the biological occupational exposure limit for Pb-B of 70 µg/dl, as proposed in 1982 in the EEC for male workers, should be lowered.¹ There are, however, some flaws that limit the way in which the data may be interpreted:

(1) The demonstrated mean values of nerve conduction velocities (NCV) show no consistent findings. For instance, the value for the sensory NCV of the median nerve is somewhat greater for the lead exposed workers, by comparison with the controls, whereas in the case of the motor fibres of the median nerve the opposite is found. This is unusual, since most studies concerning NCV and lead showed negative effects in all the nerves investigated.²⁻⁶

(2) The age (mean or distribution or both) of the lead exposed workers and of the control group is not given. It is well known that the NCV decreases with increasing age.⁷ For this reason, a misinterpretation of the neurophysiological data cannot be excluded.

(3) The authors performed no correlation analyses for the detection of possible dose-effect/response relationships. These statistical tests are important for the evaluation of significant causal relationships or trends.

(4) Blood lead concentrations (Pb-B) were estimated only once. Seppäläinen and coworkers² and our own study⁸ showed that it is not the "actual", but the "time weighted average" concentrations of Pb-B that are more relevant for defining chronic lead exposure.

(5) The authors give no information about the lower limits of the neurophysiological parameters measured. Therefore the incidence and degree of abnormal NCV in both groups are unknown.

The study takes no account of the latest scientific findings and there are some procedural, methodological, and statistical gaps. In my opinion, therefore, the conclusion drawn from this research is not substantiated.

G TRIEBIG

*Institute of Occupational- and Social-Medicine,
University of Erlangen-Nürnberg,
8520 Erlangen, Schillerstr 25/29,
Fed Rep of Germany.*

References

- ¹ Jeyaratnam J, Devathasan G, Ong CN, Phoon WO, Wong PK. Neurophysiological studies on workers exposed to lead. *Br J Ind Med* 1985;42:173-7.
- ² Seppäläinen AM, Hernberg S, Kock B. Relationship between blood lead levels and nerve conduction velocities. *Neurotoxicology* 1979;1:313-32.
- ³ Englert N. Periphere motorische Nervenleitgeschwindigkeit bei Probanden mit beruflicher Blei-Exposition. *Arbeitsmed Sozialmed, Präventivmed* 1980;15:254-60.
- ⁴ Ashby JAS. A neurological and biochemical study of early lead poisoning. *Br J Ind Med* 1980;37:133-40.
- ⁵ Bordo B, Massetto N, Musicco M, Filippini G, Boeri R. Electrophysiologic changes in workers with "low" blood lead levels. *Am J Ind Med* 1982;3:23-32.
- ⁶ Singer R, Valciukas JA, Lilis R. Lead exposure and nerve conduction velocity: the differential time course of sensory and motor nerve effects. *Neurotoxicology* 1983;4:193-202.
- ⁷ Ludin HP. *Praktische Elektromyographie*. Stuttgart: Enke, 1981.
- ⁸ Triebig G, Weltle D, Valentin H. Investigations on neurotoxicity of chemical substances at the workplace. V. Determination of the motor and sensory nerve conduction velocity in persons occupationally exposed to lead. *Int Arch Occup Environ Health* 1984;53:189-204.

Book review

N-Nitroso compounds: occurrence, biological effects and relevance to human cancer. Edited by IK O'Neill, RC von Borstel, CT Miller, J Long, and H Bartsch. (Pp 1011, £75.00.) Oxford: Oxford University Press (for the International Agency for Research on Cancer (IARC 57)), 1985.

Dimethylnitrosamine was shown to induce liver tumours in rats in 1956 and now over 100 different N-nitroso carcinogenic compounds are known. The Lyon International Agency for Research on Cancer has organised eight international symposia on N-nitroso compounds. The last, held in Banff, Canada, was attended by 200 participants and the proceedings occupy over 1000 pages.

Although nitrosamines cause cancer in many different animal species, there is still no convincing evidence that they have caused cancer in man. "The nitrosamines in fermented tobacco" provide the greatest and most widespread source of human exposure presently known (except for some occupational exposures). The association between human