

References

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Dr Baxter replies:

Brooke *et al* should have finished their quotation from Jacobs: "Urinary cytology is a valid and acceptable screening technique, *but as yet there is no clear evidence of increased length of survival for screened groups, nor have claims of improved quality of survival in screened groups been adequately investigated*" (my italics). Until future studies do resolve this issue, urinary cytology will remain of doubtful benefit, a view shared by the Health and Safety Executive who recently decided not to recommend the technique for workers exposed to MBOCA. Brooke *et al* make other points which do not relate to its validity as a screening tool but are reasons for undertaking medical surveillance.

I wrote that occupational carcinogens will continue to be slowly identified through a combination of laboratory, epidemiological, and clinical means. In a previous editorial (1988;45:721-6) Magos described how there was no toxicity information available for most of the thousands of chemicals in commercial use. Too little is known about the health effects of industrial exposures to most chemicals to declare that the control of occupational carcinogens is now complete.

Relation between mercury and selenium in pituitary glands of dental staff

SIR,—Analyses of mercury concentration have shown high concentrations of mercury in the pituitary glands of dental staff.^{1,2}

By contrast with mercury (Hg), selenium (Se) is an essential trace element. After simultaneous administration to rats, Hg and Se have been reported to be associated with a single protein fraction in the plasma. The atomic ratio of Hg to Se in this fraction was close to 1:1 for different doses of Hg²⁺ and SeO₃.^{2,3} Co-administration of Hg and Se usually leads to increased whole body retention of both elements, especially of mercury. Se decreases the acute toxicity of inorganic mercury in short term animal studies and conversely Hg decreases the toxicity of Se.³ Lindh and Johansson reported mutually decreased toxicity when Hg and Se were given at the same time to rats.⁴ In histological sections Hg and Se were shown to be retained in a constant relation in the reticuloendothelial and proximal tubuli cells of the liver and kidneys, respectively. A protective mechanism through specific binding or chemical association was suggested.

Hg and Se concentrations have been analysed in

Mercury and selenium concentrations in pituitary glands. Analyses performed with radiochemical neutron activation analysis (RNAA)

Case	Hg	Se
	(ng/g wet weight)	
Dentists:		
1 (M, 80)	4040	1820
2 (M, 50)	343	710
3 (M, 80)	3650	1700
Dental assistant:		
4 (F, 67)	1280	970

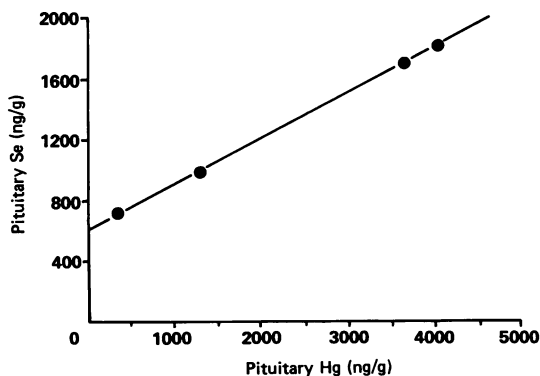
four pituitary glands from dental personnel (table and figure). The extremely high correlation between Hg and Se at such high concentrations suggests some form of chemical association between the elements. In 1975 Kosta *et al* reported an approximate 1:1 atomic ratio in several organs, including the pituitary gland, from former mercury miners.⁵ This relation has not been further elucidated in man. The present data show an atomic ratio somewhat different from 1:1. As this result, however, is based on a small sample it does not warrant any conclusions as to the exact quantitative relation. The two dentists with the highest Hg and Se concentrations were old and had not been occupationally exposed for several years due to retirement and incapacitating neurological disorders. As hypothesised by Kosta *et al*, these data suggest coaccumulation of Hg and Se with long biological half times.

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Mercury and selenium concentrations in pituitary glands. Analyses performed with radiochemical neutron activation analysis (RNAA).

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- 3 Magos L, Webb M. The interactions of selenium with cadmium and mercury. *CRC Crit Rev Toxicol* 1980;8:1-42.
- 4 Lindh U, Johansson E. Protective effect of selenium against mercury toxicity as studied in the rat liver and kidney by nuclear analytical techniques. *Biol Trace Elem Res* 1987;12:109-20.
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Medical planning for toxic releases into the community: the example of chlorine gas

SIR,—The article by Baxter *et al* (1989;46:277-85) was of great interest. In particular, the designation of three concentration bands indicative of death, danger, and distress that are described in table 1 correspond closely to the concentration ranges proposed by the American Industrial Hygiene Association (AIHA) for their emergency response planning guidelines and to the types of effect (death, disability, and discomfort) defined by the European Chemical Industry Ecology and Toxicology Centre's (ECETOC) task force on emergency exposure indices. The AIHA has published 15 emergency response planning guidelines, each

giving three concentration below which, even if they are sustained for one hour, effects are unlikely to be life threatening (ERPG-3), cause irreversible or serious health effects, impair the ability to take protective action (ERPG-2), or cause to be experienced other than mild, transient adverse health effects or perception of objectionable odour (ERPG-1).

The ECETOC task force has considered in detail the definitions and methods of setting and use of such emergency exposure indices (EEIs) and has taken chlorine as a work example for the methodology of setting limits. Currently, several expert groups are ring testing the ECETOC method for phosphine, hydrogen fluoride, and acrylonitrile, evaluating the usefulness of its draft technical report. It is intended that the final report with the result of the methodological ring test will be published before the end of 1989.

It is to be hoped that values for EEIs (including ERPGs) and the appropriate techniques of setting and using them to facilitate the medical planning for toxic releases into the community will be developed. The decisions to be taken in such planning, however, will always require considerable expertise in accident scenarios, gas dispersion, toxicology, and emergency medicine. Such decisions can never be simply administrative.

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