Residual small-Fibre Neuropathic Dysfunction Associated with Past Occupational Elemental Mercury Exposure

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Background. Epidemiological studies of elemental mercury vapour (Hg°) exposed groups have shown that the effects of exposure on the peripheral nervous system are detectable for decades after the cessation of exposure. The neurological and neurophysiological evaluations were characteristic of peripheral sensorimotor axonal polyneuropathy (ALBERS ET AL. 1988, ELLINGSEN ET AL. 1993, LETZ ET AL. 2000), but no data are available on small-fibre neuropathic dysfunctions following Hg° exposure.

Objective. The purpose of the investigation was to study the potential association between occupational Hg° exposure and small-fibre neuropathy among subjects with past exposure to Hg°.

Subjects ands methods. In about 10 % of the ex-mercury miners previously exposed to Hg° who were presented in our recent study (Kobal et al. 2004), the symptoms of small – fibre neuropathic dysfunctions were observed. Temperature and pain perception thresholds were assessed by the quantitative psychophysical test. The Marstock method (FRUHSTORFER ET AL. 1976) on a TSA 2001 Thermal Sensory Analyser (Medoc Ltd, Ramat Yishai Israel) was applied. Thermal specific and thermal pain thresholds were assessed.

Results. The preliminary results of neurophysiological measurements conducted in five ex-mercury miners are presented. In ex-mercury miners with a mild disease, the increased thresholds and no aberrant sensations were established. In more severe, advanced disease, the anesthesia and analgesia were frequently determined and aberrant sensations were ordinarily assessed. These results support our decision to futher study the potential effect of Hg° on small-fibre neuropathic disfunctions.

REFERENCES

FRUHSTORFER, H., LINDBLOM, U., SCHMIDT, W.G. (1976) Method for quantitative estimation of thermal thresholds in patients. J Neurol Neurosurg Psychiatry, 39:1071-5

LETZ, R., GERR, F., CRAGLE, D., GREEN, R.C., WATKINS, J., FIDLEK, A.T. (2000) Residual neurologic deficits 30 years after occupational exposure to elemental mercury. Neuro Toxicologiy, 21:459-74

KOBAL, A.B., HORVAT, M., PREZELJ, M., SEŠEK-BRIŠKI, A., KRSNIK, M., DIZDAREVIČ, T., MAZEJ, D., FALNOGA, I., STIBILJ, V., ARNERIČ, N., KOBAL, D., OSREDKAR, J. (2004) The impact of long-term past exposure to elemental mercury on antioxidative capacity and lipid peroxidation in mercury miners. J. Trace Elem. Med, BIol. Vol. 17 (4), 261-274