

Valutazione degli effetti neurotossici e nefrotossici conseguenti all'esposizione a lungo termine a mercurio metallico dei lavoratori addetti agli impianti Cloro-Soda

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KEY WORDS

Chloro-alkali production; mercury; nephrotoxicity; neurobehavioral; neurotoxicity; occupational exposure

SUMMARY

«Evaluation of neurotoxic and nephrotoxic effects of long-term exposure to elemental mercury in workers of a chlorine-sodium hydroxide production plant». Objectives: *Within the frame work of a wide multicentre study, a sub-study was developed in order to explore the occurrence of early effects on the central nervous system, on the kidney and on the neuro-immunitary system in the workers of a chloro-alkali production plant exposed to metallic mercury at airborne concentration levels lower than 0.025 mg/m³ (TLV-TWA). They were compared to a control population of employees of the same huge petrochemical plant with different job that did not implicate exposure to mercury vapors. Specifically, the study aimed at revealing the occurrence of early effects on the central nervous system related with mercury exposure, as can be assessed through neurophysiological and neurobehavioral tests.* **Methods:** *The excretion of urinary mercury was measured by atomic absorption spectrometry. The study of renal function was assessed by measurement of the urinary excretion of some high and low molecular weight protein markers (albumin, β_2 -microglobulin, retinol-binding protein, fibronectin, specific proximal tubule brush border antigens, N-acetyl- β -D-glicosaminidase). The neurobehavioral status of the study subjects was assessed by means of several test parameters (Simple Reaction Time, Color Word Vigilance Test, Symbol Digit, Finger Tapping, Mood Scale of Kjellberg and Iwanowski, Subjective symptoms questionnaire (QSS), Luria Nebraska Motor Scale, Branches Alternate Movement Task and Tremometry).* **Results:** *The values of urinary excretion averaged 12 \pm 8 μ g Hg/g of creatinine for the exposed workers group (n=38), while for the reference group (n=34 cases) urinary excretion was statistically lower, averaging 4 \pm 6 μ g Hg/g of creatinine. Neither the parameters selected for the assessment of renal functions, nor those chosen to probe the neurobehavioral status of the probands revealed statistically reliable differences between the group of exposed workers (length of exposure: range 1-34 years) and the control group. Nevertheless, some minor but still statistically reliable correlations were found between some neurobehavioral parameters and*

Pervenuto il 6.2.2002 - Accettato il 8.4.2002

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*some demographic variables describing the whole group of tested workers, but not to the level of occupational exposure to mercury. **Conclusions:** The results of the study confirm the lack of toxic effects of clinical importance on the central nervous system and on the kidney for values of mercury urinary excretion lower than the suggested index of biological exposure (IBE) of 35 μg Hg/gram of creatinine.*