

Chronic psychological effects of exposure to mercury vapour among chlorine-alkali plant workers

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KEY WORDS

Environmental worry scale; occupational exposure; mercury vapour poisoning; abnormal performance of psychological tests; neurotic syndrome

SUMMARY

Background: *Quantitative assessment of nervous system function is essential in characterising the nature and extent of impairment in individuals experiencing symptoms following work-place mercury vapour exposure.* **Objectives:** *The purpose of this study was the application of standardised tests of behavioural, psychomotor and memory function to understand the neuropsychological effects of mercury in occupationally exposed chlorine-alkali plant workers.* **Subjects and methods:** *The study comprised 45 workers at a chlorine-alkali plant with the mean age of 39.36±5.94 years, who had been exposed to daily inhalation of mercury vapour over long-term employment of 16.06±4.29 years. The cumulative mercury index was 155.32± 95.02 µg/g creatinine, the mean of urinary mercury concentrations on the first day of the study was 119.50±157.24 µg/g creatinine, and the mean of urinary mercury concentrations 120 days after cessation of exposure was 21.70± 26.07 µg/g creatinine. The analysis included tests of behavioural, psychomotor and memory function. The behavioural test battery consisted of: Environmental Worry Scale (EWS), Minnesota Modified Personal Inventory (MMPI-2), Purdue standard 25 minute test, and adapted, 10 minutes test, Bender's Visual-Motor Gestalt test (BGT), and Eysenck Personality Inventory (EPQ). The data were compared to a control group of 32 not directly exposed workers.* **Results:** *In the mercury vapour exposed workers with relatively high level exposure to inorganic mercury vapour (TWA/TLV=0.12 mg/m³/0.025 mg/m³) we identified somatic depression-hypochondria symptoms with higher scores for scales: hysteria (P<0.001), schizoid and psycho-asthenia (MMPI-2). The mercury-exposed workers had introvert behaviour (EPQ, MMPI-2). The cognitive disturbances in mercury-exposed workers were identified as: concentration difficulty, psychomotor, perceptual and motor coordination disturbances, and brain effects. We identified fine tremor of the hands in 34 out of 45 mercury-exposed workers (BGT).* **Conclusions:** *The results point to a relationship between the duration of mercury exposure and the long-term, probably irreversible, psychological disturbances.*

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