Health Effects of Solvent Exposure in Railroad Workers

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A referral cohort of 100 railroad workers was evaluated to determine if extensive exposure to a variety of organic solvents, including carbon tetrachloride, perchlorethylene, trichloroethane, and trichloroethylene, resulted in hepatotoxicity, lipid abnormalities, and neurotoxicity. Most patients (58%) provided a history of nausea, dizziness, and headache on the job. Several (9%) had more severe symptoms, such as loss of consciousness. The magnitude of solvent exposure was estimated from occupational history. Average age was 49.3 years (range 35-71 years). Sixty percent of the patients had presenting chief complaints relating to the central nervous system. The most frequent complaint was memory loss (80%), followed by headaches, forgetfulness, irritability, and depression. Confounding variables, including diabetes mellitus, coronary artery disease, hyperlipidemia, infectious hepatitis, alcoholism, obesity, and psychiatric illness were also reviewed. Excluding patients with infectious hepatitis, liver function tests demonstrated more mild elevations in the ALT and GGT than AST. Fasting triglycerides were bimodally distributed: normal in 29% or severely elevated (over 300 mg/dl) in 33% of non-diabetic patients. Fasting cholesterol was only mildly elevated (between 200-250 mg/dl) in 52% of non-diabetic patients. Neuropsychologic testing showed cognitive deficits in the majority of patients with memory loss. Neuroimaging studies are underway. Data suggest an association between prolonged solvent exposure and hepatocellular dysfunction, abnormalities in lipid metabolism, neurotoxic complaints, and neuropsychologic deficits. Further designed population investigation is proposed to evaluate aspects of causation, dose-response, neurologic abnormalities, and treatment.

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