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Hearing complaints related to solvent exposure: Possible connections to (central) auditory processing disorder

Fuente, A., McPherson, B.

Centre for Communication Disorders, The University of Hong Kong, Hong Kong

Various research studies have demonstrated that organic solvent exposure may induce hearing loss. Studies based on animal models have shown outer hair cell damage due to solvent exposure. Research conducted in workers occupationally exposed to solvents suggests on one hand, poorer hearing thresholds than matched non-exposed workers, and on the other hand, has also suggested central auditory damage due to solvent exposure. Taking into consideration the possible auditory damage induced by solvent exposure due to the neurotoxic properties of such substances, the present research aimed to study possible (central) auditory processing disorder [(C)APD], and possible hearing difficulties in daily life listening situations that solvent-exposed workers may acquire. 70 workers exposed to organic solvents (xylene, toluene, methyl ethyl ketone) and 70 age and gender matched non-exposed workers were assessed. Only subjects with no history of ear infections, high blood pressure, kidney failure, metabolic and neurological diseases, and alcoholism were selected. Subjects had either normal hearing or sensorineural hearing loss, and type A tympanometry results (Jerger, 1970). The following procedures were carried out: Hearing-in-noise (HINT) test; dichotic digit (DD); filtered speech (FS); pitch pattern sequence (PPS); random gap detection (RGD); and masking level difference (MLD) tests. A self-report inventory detailing each subject¡¦s performance in daily life listening situations, the Amsterdam Inventory for Auditory Disability and Handicap, was also administered. Significant differences between exposed and non-exposed workers were found for hearing thresholds at most test frequencies, for both ears. However, exposed-workers still presented normal hearing thresholds as a group (equal or better to 20 dB HL). For the HINT, DD, PPS, FS, and RGD tests, non-exposed workers obtained better results than exposed workers. Finally, solvent-exposed workers reported significantly more hearing complaints in daily life listening situations than non-exposed workers. A possible (C)APD related to solvent exposure is considered and the clinical implications of the findings are discussed.