EVALUATION OF THE PERIPHERAL NERVOUS SYSTEM AMONG WORKERS EMPLOYED IN THE PRODUCTION OF CHEMICALS CONTAMINATED WITH 2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN

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Effects of exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) on the peripheral nervous system were evaluated in a cross-sectional medical study of 241 2,4,5-trichlorophenol (TCP) production workers and 232 unexposed age, race and community matched referents. 2,3,7,8-TCDD was produced unintentionally during trichlorophenol production. Peripheral nerve function was assessed by a neurologic examination, by electrophysiologic and thermal and vibration sensitivity tests, and by self-reported symptoms. Cases of peripheral neuropathy of the upper and lower limbs were defined using data from the neurologic assessment. Case severity was defined as the sum of neurologic abnormalities.

Of those examined for peripheral neuropathy, 18% of the workers and 19% of the referents met the case definition. Logistic regression models evaluated the effect of exposure to 2,3,7,8-TCDD on peripheral neuropathy. Exposure was defined as a dichotomous variable (workers versus referents), categorically as serum 2,3,7,8-TCDD levels, and continuously as serum

2,3,7,8-TCDD. No exposure measurement was related to the risk of developing peripheral neuropathy of either the upper (OR=1.0, One-sided Lower 95% Confidence Limit (CL) 1.0) or lower limbs (OR=1.0 One-sided Lower 95% CL 1.0). Only increasing age was statistically significantly predictive of peripheral neuropathy. The mean severity scores for the upper limb (5.07, workers/6.36, referents) or the lower limb (8.59, workers/8.73, referents) were not statistically significantly different.

Serum 2,3,7,8-TCDD levels were available for 272 workers and 86 referents. Workers' mean serum 2,3,7,8-TCDD level was 211 parts per trillion (ppt) which was statistically significantly higher than the referents' mean of 6 ppt ($p<.0001$). The mean serum 2,3,7,8-TCDD level of 219 ppt (upper body) or 102 ppt (lower body) for workers with peripheral neuropathy did not differ significantly from the means of 164 ppt (upper limbs) or 190 ppt (lower limbs) for workers without peripheral neuropathy.

These data suggest that the risk of peripheral neuropathy is unrelated to exposure to 2,3,7,8-TCDD contaminated chemicals, when exposure is evaluated as the serum level of 2,3,7,8-TCDD measured concurrently with neurologic assessment. These data also suggest that age is more predictive of either lower or upper limb peripheral neuropathy than past 2,3,7,8-TCDD exposure.