

**Prevalence of Diabetes and Elevated Serum Glucose Levels in Workers Exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)**

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Altered glucose metabolism and increased prevalence in diabetes are among the many health effects attributed to occupational exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) contaminated substances. Two reports have described such occurrences among workers<sup>1,2</sup>. Animal data also suggest that TCDD may alter glucose levels, although the mechanism is not clear<sup>3-6</sup>.

To examine the relationship between diabetes and occupational exposure to chemicals contaminated with TCDD, we evaluated the prevalence of diabetes in 281 workers and 258 unexposed referents, matched for age, race, sex and community. We also assessed the association between fasting serum glucose levels and TCDD exposure.

Exposure to TCDD occurred during the production of 2,4,5-trichlorophenol and was assessed by lipid-adjusted serum TCDD levels using techniques described previously<sup>7-8</sup>. The TCDD level for workers of 220 parts per trillion (ppt) was statistically significantly higher than that for referents (7 ppt) ( $p < .0001$ ), suggesting high occupational exposure by the workers.

Diabetic status was determined through information obtained during a comprehensive, two day medical examination and medical history, and fasting serum glucose levels were obtained on both mornings of the medical examination. Workers and referents participated in the same medical examination. An individual was considered to be a case of diabetes if, prior to the study, they were diagnosed by a physician as diabetic or had a fasting serum glucose level of 140 mg/dl or greater measured on the two mornings of the study<sup>9</sup>. Twenty-six workers and 15 referents met the case definition for diabetes. The unadjusted mean serum TCDD level for worker cases (640 ppt) was significantly greater than that of worker noncases (170 ppt) ( $p < 0.05$ ). We evaluated the relationship between serum TCDD levels and diabetes using logistic regression models.

Fasting serum glucose levels ranged from 74 mg/dl - 322 mg/dl for the 262 workers and 47 mg/dl - 415 mg/dl for the 247 unexposed referents who, at the time of the study, were not taking medication to reduce serum glucose levels. Linear regression models were developed to evaluate the relationship between serum glucose and TCDD. The covariates of age, race, sex, body mass index, familial history of diabetes, and alcohol consumption were examined as potential confounders and as

interaction terms in both the logistic and linear regression models. The presentation will describe the results of all analyses and discuss the findings.

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