Objectives Previous studies have noted associations between specific pesticides and multiple cancer types. However, assessments for many pesticides have been limited by small numbers of exposed cases. To address this, we established the North American Pooled Project (NAPP), a collaborative population-based case-control studies conducted in four American states with a similar Canada-wide study conducted in six provinces. Descriptive analyses of pesticide exposures, personal protective equipment (PPE) use, and demographic data were collected. The prevalence of self-reported pesticide use among cases and controls was determined for specific agents and chemical classes.

Results The NAPP includes 5131 controls and 3274 cases (non-Hodgkin lymphoma [NHL] N=1690; Hodgkin lymphoma [HL] N=5107; multiple myeloma [MM] N=587, soft tissue sarcoma N=490). Preliminary descriptive analyses indicate that approximately two-thirds of controls and NHL and MM cases ever lived or worked on a farm or ranch. Nearly half of controls and half of NHL, HL, and MM cases reported using any pesticide. Over 120 different insecticides, herbicides, and fungicides were reported. More than 17% of participants reported using the phenoxy herbicide 2,4-D and over 3% reported DDT, malathion, atrazine, or glyphosate. Around 6% of NHL cases and controls reported ever using PPE.

Conclusions The large, number of cases and controls and high frequency of pesticide use in the NAPP will allow us to evaluate less commonly used pesticides, cancer sub-types, and smaller relative risks than previously possible.

Method Participants attended the American Dental Association’s (ADA) conventions held from 1997–2006. Individual surveys were completed and measurements were taken of the median and ulnar sensory nerve amplitude and latency in the dominant hand. The ADA has measured the average urinary mercury concentration of participants since 1977, allowing a cumulative mercury exposure to be estimated for each individual dentist based on the number of years they practiced dentistry. Both fixed and mixed effects (accounting for repeated measures) linear regression models were used.

Results 3923 observations from 2649 dentists were used to perform linear regression using multiple models. Models included individuals with or without imputed BMI, along with either repeated measures or initial observations only. Adjusted covariates included hand temperature, gender, age and BMI. Individuals with rheumatoid arthritis, diabetes, carpal tunnel syndrome (for median nerve models only), or hand temperatures interfering with the accuracy of the instrument were excluded. The main effect of cumulative exposure was found to be significant (p-value <0.05) in median nerve latency and amplitudes but insignificant in ulnar nerve measures. All models but ulnar nerve latency showed a highly significant interaction of cumulative exposure and age (p-value < 0.01).

Conclusions Using an estimated cumulative mercury exposure as the measure of effect shows a significant positive association with decreased peripheral nerve function. This study is the first of its kind to estimate dentists’ cumulative mercury exposure and its effect on peripheral nerve function.
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