

Ammonium Perfluorooctanoate: Cross-Sectional Surveillance of Clinical Measures of General Health Status Related to a Serum Biomarker of Exposure

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A cross-sectional occupational survey was undertaken to determine whether or not exposure to APFO in the workplace, as measured by serum PFOA levels, is related to adverse health outcomes. Of the 1863 plant site employees receiving letters requesting volunteers for the study, 782 males and 243 females enrolled. We used a standard occupational health screening examination that included a broad range of clinical chemistries, hematology, physical examination, pulmonary function tests, electrocardiography (EKG), and an extensive health and work history questionnaire. Questionnaire data provided information on cigarette smoking history, alcohol use, family history of stroke and heart attack, and identification of pre-DuPont employment industrial jobs. These variables were used as potential confounders in many analyses, which were either linear or logistic regressions with appropriate transforms when indicated.

Of the 62 clinical chemistry and hematology endpoints measured, most were well within normal ranges for all participants and not associated with serum PFOA levels. No significant associations were seen for PFOA levels and serum liver enzymes, an endpoint of *a priori* interest based on animal studies, or for any hematology measures and PFOA. Pulmonary function test results and EKGs were analyzed and determined to be unassociated with serum PFOA level. C-reactive protein was not associated with PFOA. Statistically significant relationships were identified for total cholesterol, LDL, and triglycerides with increased serum PFOA levels adjusted for body mass index, alcohol use, and age in both males and females. Although the R-square values were generally low and much variability was observed in total cholesterol at every PFOA level, the potential change in total cholesterol identified by the model was approximately 10% at a high PFOA serum level. No effect was seen in the HDL fraction. Small, but statistically significant, increases in uric acid and iron were observed among employees with the highest PFOA blood levels.

Although the cross-sectional design of this study precludes determining whether or not PFOA is the cause of the effects seen in some serum chemistry endpoints, the statistically significant results for cholesterol, LDL, triglycerides, iron, and uric acid merit additional study.