ESTIMATING THE EFFECTS OF LONG-TERM EXPOSURE TO AMBIENT PARTICULATE AIR POLLUTION ON BIOLOGICAL MARKERS OF CARDIOVASCULAR RISK IN A COHORT OF MIDLIFE WOMEN

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Background and Aims: Several studies have reported associations between long-term exposure to fine particulate matter ($PM_{2.5}$ or particles less than 2.5 microns in diameter) and cardiovascular mortality. However, uncertainty remains about the biological mechanisms underlying the disease process. We examined the effect of $PM_{2.5}$ on serum markers of cardiovascular disease risk in a cohort of midlife women.
Methods: Midlife women enrolled at six sites in the multi-ethnic, longitudinal Study of Women's Health Across the Nation (SWAN) had repeated measurements of several cardiovascular markers, including LDL, HDL, C-reactive protein, fibrinogen, tissue-type plasminogen activator antigen (tPA-ag), plasminogen activator inhibitor Type 1 (PAI-1), and Factor VIIc. These data were merged with ambient exposure data over 5 consecutive annual visits (1999-2004) using $PM_{2.5}$ monitors located within 20 kilometers of the geocoded residence. Monitor measurements were averaged for the preceding year, 6 months, 1 month and 1 day prior to each blood draw visit.
Results: A total of 2,191 women (990 Caucasian, 598 African American, 241 Japanese, 193 Chinese, and 169 Hispanic) were eligible for analysis; mean age at the beginning of the study period was 49 years. The $PM_{2.5}$ annual average across the SWAN sites for all visits ranged from 12.1 to 20.8 mg/m^3. Our analysis examined the association between $PM_{2.5}$ and the blood markers using longitudinal linear mixed regression models, taking into account other air pollutants, temperature, body mass index, race/ethnicity, age, smoking, socioeconomic status, menopausal status, health history, and medication use. Preliminary results for the association of $PM_{2.5}$ with the cardiovascular markers will be presented.
Conclusions: This is the first study to use repeated measures to examine the longitudinal association between blood markers of cardiovascular disease risk and $PM_{2.5}$ in a multi-ethnic, longitudinal cohort of women going through the menopausal transition.
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