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 Presentation Abstract
 

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 Session: MP05-Young Investigator Finalists - EPI
 

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 Wednesday, Mar 23, 2011, 5:00 PM - 7:00 PM
 

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 Presentation: MP029 - **Longitudinal and Cross-Sectional Associations between Fine Particulate Air Pollution and Intima-Medial Thickness of the Common Carotid Artery: The Multi-Ethnic Study of Atherosclerosis and Air Pollution**


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 Location: MP029
 

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 Pres. Time: Wednesday, Mar 23, 2011, 5:00 PM - 7:00 PM
 

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 Category: +EPI - Environmental
 

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 Keywords: Subclinical atherosclerosis; Public health; Geographic Disparities in Health
 

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 Abstract: **Background:** Chronic exposures to fine particulate matter (PM<sub>2.5</sub>) have been linked to cardiovascular morbidity and mortality, possibly via accelerated atherosclerosis. Using common carotid artery intima-medial thickness (IMT) as a surrogate for atherosclerosis, we hypothesized that long-term PM<sub>2.5</sub> concentrations would be associated with an increased IMT extent and rate of progression.

**Methods:** Participants of the Multi-Ethnic Study of Atherosclerosis, aged 45 to 84 years and without clinical cardiovascular disease at baseline, had two ultrasounds for IMT between 2000 and 2005 (mean follow-up: 2.8 years). Long-term PM<sub>2.5</sub> concentrations were estimated for each participant over the year before baseline and the period between ultrasounds using a finely resolved spatio-temporal model, which incorporates cohort-specific air monitoring data and geographic variables. Cross-sectional and longitudinal associations among persons not on statin therapy were examined in a unified model of the log of IMT using generalized estimating equations, clustering on subject and adjusting for traditional risk factors including age, sex, race, smoking, and blood pressure. We also controlled for the six study centers (each in a different state) to examine the relationship of within-metropolitan area PM<sub>2.5</sub> variation and IMT.

**Results:** Among 4,089 participants with an average IMT of 700 μm and mean rate of progression of 12 μm/year, we found that living in areas with higher long-term PM<sub>2.5</sub> concentrations was associated with a greater IMT. Cross-sectionally, an inter-quartile increase of 2 μg/m<sup>3</sup> in PM<sub>2.5</sub> was associated with a 0.8% (95% CI: 0.3 to 1.3 %) increase in IMT. Overall, no association between PM<sub>2.5</sub> and progression of IMT was found, but a strong

and statistically significant association was found after control for center. A  $2 \mu\text{g}/\text{m}^3$  increase in within-metropolitan area  $\text{PM}_{2.5}$  was associated with a 5.8% (95% CI: 3.0 to 8.7%) increase in IMT progression. These within-metropolitan area associations were generally consistent across center, with three of six areas meeting statistical significance.

**Conclusions:** Living in areas with higher  $\text{PM}_{2.5}$  was cross-sectionally associated with increased IMT. Gradients within metropolitan areas also were associated with increased IMT progression. Between-metropolitan area differences in  $\text{PM}_{2.5}$  were not related to IMT progression but such contrasts might be confounded by region or center-specific features. These findings suggest that long-term  $\text{PM}_{2.5}$  exposures may be associated with the acceleration of atherosclerosis, even at current levels, and support previously reported associations with clinical cardiovascular disease development.

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Disclosures: **S.D. Adar:** B. Research Grant; Significant; received research grants (or support on research grants) on related topics from the USEPA. **L. Sheppard:** B. Research Grant; Significant; received support on research grants on related topics from NIH.. **J.F. Polak:** None. **P.D. Sampson:** B. Research Grant; Significant; received support on research grants on related topics from HEI.. **A. Diez Roux:** None. **M. Budoff:** None. **D. Jacobs:** None. **R. Barr:** B. Research Grant; Significant; received research grants (or support on research grants) on related topics from the NIH.. **K. Watson:** None. **J.D. Kaufman:** B. Research Grant; Significant; received research grants (or support on research grants) on related topics from the NIH..

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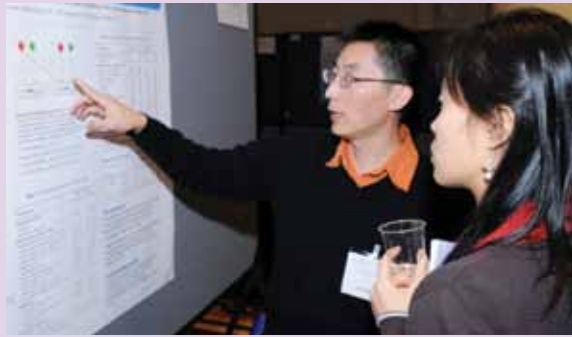
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NPAM March 22–24, 2011 | EPI March 23–25, 2011 | Atlanta Marriott Marquis | Atlanta, GA

This is an annual scientific meeting of the American Heart Association sponsored by the Council on Epidemiology and Prevention and the Council on Nutrition, Physical Activity and Metabolism.

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