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Effect of PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>1</sub> on blood markers in a panel of elderly subjects

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Effect of PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>1</sub> on blood markers in a panel of elderly subjects.

**BACKGROUND:** Systemic inflammation biomarkers have been associated with risk of cardiovascular morbidity and mortality.

**OBJECTIVES:** We aimed to clarify associations of particulate matter (PM<sub>10</sub>/PM<sub>2.5</sub>/PM<sub>1</sub>) with systemic inflammation using models in the elderly subjects.

**METHODS:** We followed a panel of 44 nonsmoking elderly subjects living in a retirement home in Tehran city, Iran. Blood plasma biomarkers were measured weekly over 6 weeks and included white blood cells (WBC), high sensitive C-reactive protein (hsCRP), tumor necrosis factor-soluble receptor-II (sTNF-RII), interleukin-6 (IL-6), and von Willebrand factor (vWF). We measured hourly indoor and outdoor exposure to PM<sub>10</sub>/PM<sub>2.5</sub>/PM<sub>1</sub> mass. The random intercept linear mixed effects model was used for data analysis.

**RESULTS:** We observed significant positive associations for WBC, IL-6, and sTNF-RII with exposure to PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>1</sub>; hsCRP with PM<sub>2.5</sub> and PM<sub>1</sub>; and vWF with PM<sub>10</sub> and PM<sub>2.5</sub> mass concentration in elderly subjects from the current-day and multiday averages. Significant increase in blood markers varied by PM sizes, although in general the highest increases in marker levels were observed for PM<sub>2.5</sub>.

**Conclusions:** Our results provided some evidence that exposure to PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>1</sub> was associated with inflammation and coagulation blood markers in elderly people, but associations were dependent on particle size.