Effect of PM$_{10}$, PM$_{2.5}$, and PM$_{1}$ on blood markers in a panel of elderly subjects

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

**OBJECTIVES:** We aimed to clarify associations of particulate matter (PM$_{10}$/PM$_{2.5}$/PM$_{1}$) 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-II), interleukin 6 (IL-6), and von Willebrand factor (vWF). We measured hourly indoor and outdoor exposure to PM$_{10}$/PM$_{2.5}$/PM$_{1}$ mass. The random intercept linear mixed effects model was used for data analyses.

**RESULTS:** We observed significant positive associations for WBC, IL-6, and sTNF-II with exposure to PM$_{10}$, PM$_{2.5}$, and PM$_{1}$; hsCRP with PM$_{2.5}$ and PM$_{1}$; and vWF with PM$_{10}$ and PM$_{2.5}$ 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$_{2.5}$.

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