Abstract

CONTEXT: Bronchoscopy with bronchoalveolar lavage (BAL) is used to measure pulmonary effects in inhalational exposure studies.

OBJECTIVES: To determine how host and background environmental factors may affect pulmonary responses in BAL.

MATERIALS AND METHODS: We retrospectively analyzed 77 healthy non-smoking volunteers (38 males and 39 females, age 18-35) who participated in a bronchoscopy study to donate cells for in vitro studies. BAL was performed by lavaging one subsegment of both the lingular segment of the left upper lobe and the right middle lobe with 250 ml of sterile normal saline each. We obtained temperature, relative humidity, ambient O3, PM2.5 and PM10 levels from monitor stations in Durham area in North Carolina. We correlated concentrations of leptin, adiponectin, monocyte chemotactic protein-1 (MCP-1), interleukin (IL)-8, ferritin and total lavaged cells in BAL samples with body mass index (BMI), age, ambient O3, PM2.5, PM10, temperature and relative humidity.

RESULTS: Increased BMI was associated with higher lavage leptin. Males had higher MCP-1 and total lavaged cells than females. Average PM2.5, PM10 and O3 concentrations before bronchoscopy were 13.7 μg/m(3), 21.2 μg/m(3) and 0.029 ppm, respectively. Using stepwise multiple linear regression, we found positive associations of MCP-1 with BMI, and of total lavaged cells with humidity and O3. There were inverse associations of IL-8 and total lavaged cells with temperature.

DISCUSSION AND CONCLUSIONS: Background environmental and host factors may affect some pulmonary responses to ambient pollutants. Interpretation of pulmonary effects in inhalational exposure studies may need to consider the effects of some host and environmental factors.