

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, PM_{2.5} 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, PM_{2.5}, 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 PM_{2.5}, PM₁₀ and O₃ concentrations before bronchoscopy were 13.7 µg/m³, 21.2 µg/m³ 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.