
Air pollution and heart rate variability among the elderly in Mexico City.

Emory University School of Medicine, Atlanta, GA 30335, USA. fch5@cdc.gov

Abstract

BACKGROUND: Suspended particles and ozone have been associated with varying degrees of cardiac autonomic dysfunction.

METHODS: In Mexico City, residents from a nursing home underwent heart rate variability analysis every other day for 3 months. Indoor and outdoor PM2.5 (particulate matter less than 2.5 mm in diameter) were measured daily at the nursing home. Levels of ozone and other atmospheric pollutants were obtained from a nearby automated monitoring station.

RESULTS: Of the initial 42 screened participants, 34 (81%) were followed during the study period. The 24-hour average levels of indoor PM2.5 ranged from 15 to 67 micro g/m3, and outdoor PM2.5 ranged from 9 to 87 micro g/m3. Daily 1-hour maximum ozone levels ranged from 47 to 228 ppb. After adjusting for age and heart rate, we observed a strong decrease in the high frequency component of heart rate variability and the average 24-hour concentrations of PM2.5. Participants with hypertension had considerably larger reductions in their HF-HRV (high frequency-heart rate variability) component in relation to both ozone and PM2.5 exposure.

CONCLUSIONS: Our results suggest that ambient levels of PM2.5 and ozone can reduce the high-frequency component of heart rate variability in elderly subjects living in Mexico City and that subjects with underlying hypertension are particularly susceptible to this effect.

PMID: 14501266 [PubMed - indexed for MEDLINE]