

Effects of Ambient Carbon Monoxide and Atmospheric Particles on Asthma Symptoms: Results from the CAMP Air Pollution Asthma Study

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A panel of 133 asthmatic children ages 5 to 14 residing in the greater Seattle area was observed for an average of 58 days (range 28-112 days) during the pre-randomization phase of the Childhood Asthma Management Project (CAMP) study. Daily self-reports of asthma symptoms were obtained from study diaries and compared with ambient air pollution levels in repeated measures logistic regression models. We defined days with asthma symptoms as any day a child reported at least one mild asthma episode. All analyses were controlled for subject-specific variables (height, race, age, gender) and potential time-dependent confounders (day of week, season, temperature). Because of variable observation periods for subjects we estimated both between- and within-subject air pollutant effects. Our primary interest was on the within-subject effects – the effect of air pollutant excursions from typical levels in each subject’s observation period on the odds of asthma symptoms. In subject-specific models we found the odds of a day with asthma symptoms increased 33% and 61% for a 1 ppm and 10^{-4} meters b_{SP} increase in CO lagged 2 days and same-day PM, respectively (95% CIs: (1.16-1.53),(1.33,1.94)). The population average estimates indicated a 24% and 42% increase for CO and PM respectively (95% CIs: (1.08-1.42),(1.11,1.82)). We conclude there is a strong association between change in short-term air pollution levels and occurrence of asthma symptoms among children in Seattle.

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