

ASSOCIATION BETWEEN PARTICULATE MATTER(PM), O₃ AND NO_x AND EMERGENCY ROOM(ER) VISITS AND HOSPITAL ADMISSION FOR RESPIRATORY AND CARDIOVASCULAR DISEASES IN CALI-COLOMBIA

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Background and Aims: Studies have found a higher risk of respiratory and cardiovascular morbidity associated with PM exposure. Cali is the third largest city in Colombia, showing a rapid urban growth and multiple sources of air pollutants. Despite this, little is known about air quality and health effects in this developing country. We assess the association between short-term variations in PM₁₀, O₃, NO_x and ER visits, hospital admissions and mortality for respiratory(RD) and cardiovascular diseases(CVD) in Cali-Colombia.

Methods: We developed an ecological time series study between 03/2010-06/2011. Daily concentrations of PM₁₀, NO_x, 8-h average of O₃, and daily measures of meteorological variables were obtained from Air Quality Monitoring System. Records of hospital admissions and ER visits for RD and CVD were collected directly from health care institutions. Admissions were summarized into daily counts and diagnostics were based on ICD-10. Using a Generalized Additive Model with natural splines, we determined the association between daily counts of ER visits, hospital admissions and daily pollution levels.

Results: The daily average concentration of PM₁₀ was 29.1 µg/m³ (4.9-55.9); NO_x, 0.02 ppm (0.001–0.05); and the maximum 8-h average O₃, 0.02 ppm (0.008–0.05). We observed a daily average of 12 ECV and 132,8 RD admissions. The maximum admission for ECV and RD per day was 28 and 246, respectively. ECV diseases accounted for about 6% of total respiratory and cardiovascular disease admissions, while RD admissions were more than 90%. After controlling for potential confounders, we found a potential association between daily variation in PM₁₀, O₃ and NO_x and ECV, RD admissions.

Conclusions: Although not showing high levels of air pollution on air, the results suggest an association between daily variations in the concentration of air pollutants and respiratory and cardiovascular health, mainly by increasing hospital admissions and ER visits.

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