HOSPITAL ADMISSIONS AND MORTALITY AS COMPLEMENTARY OUTCOMES IN EVALUATING THE SHORT-TERM EFFECTS OF AIR POLLUTION ON RESPIRATORY HEALTH

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Backgrounds and aims: It is well known that air pollution affects respiratory health, increasing both hospitalisation and mortality. To complete a previous assessment of air pollution effects on respiratory mortality in Italy (Faustini et al, ERJ, 2011), we studied the impact of particles (PM_{10}) and nitrogen dioxide (NO_2) on hospitalisations. A combined outcome, including both hospitalisations and deaths, was also analysed for chronic obstructive pulmonary disease (COPD).
Methods: We analyzed emergency hospitalizations and out-of-hospital deaths for respiratory diseases among those aged 35+, who resided in six Italian cities. The associations with PM_{10} and NO_2 in the years 2001-2005, using a time-stratified case-crossover analysis, was evaluated.
Results: There were 106,792 hospitalisations for respiratory diseases and 5,490 respiratory deaths. The risk of hospitalisation for respiratory diseases increased by 0.63% (95% Confidence Intervals, CI, 0.18-1.09) for a 10• g/m^3 PM_{10} increase and by 1.14% (95% CI, 0.26-2.03) for a 10• g/m^3 NO_2 increase, both at lag 0. The strongest associations were observed between NO_2 and hospitalizations for COPD (1.27%; lag 0) or pneumonia (2.34%; lag 2-5). Lower effects, but with the same pattern, were observed for PM_{10}. The risk of dying increased by 4.72% for PM_{10} and by 7.44% for NO_2, both at lag 2-5. The combined outcome showed an increased risk at lag 0 for PM_{10} (0.67%) and at lag 0-5 for NO_2 (1.58%). In the warm season (April-September) all the effects were stronger than in the cold season.
Conclusions: We confirmed a respiratory health effect of air pollution in Italian cities. The combined effect was present for both PM_{10} and NO_2; they were immediate for COPD hospitalisations and delayed for hospitalisations due to respiratory infections and out-of-hospital deaths in COPD patients.