SHORT-TERM EFFECTS OF AIR POLLUTION IN A COHORT OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Backgrounds and aims: It has been postulated that patients with chronic obstructive pulmonary disease (COPD) have a higher risk of emergency medical care and death after exposure to air pollution in comparison to the general population. Few observations are available where subjects with COPD have been compared with people without the disease. We designed a study to evaluate the daily air pollution effects in COPD and non-COPD sub-groups in Rome, Italy.
Methods: We identified a dynamic cohort of COPD patients resident in the city of Rome, Italy, using hospital admission data (1998-2009) and drug prescriptions data (2005-2009); subjects without COPD from the general population of the city were also defined. The follow-up for emergency hospitalisations and mortality lasted from 1st February 2005 to 31st December 2009. We carried-out a case-crossover analysis to estimate short-term effects of airborne pollutants (PM_{10}, $PM_{2.5}$, NO_2 and ozone) in the COPD cohort (analysis for the comparison cohort is on-going) .
Results: There were 49755 emergency hospitalisations and 16,683 deaths (18% out-of-hospital) in the cohort of 147,067 suffers from COPD as identified from hospital diagnoses (23%) or drugs prescriptions of respiratory drugs (77%). An increased risk of hospitalisation for respiratory diseases (3.88%; 95% Confidence Intervals, CI, 0.98-6.87) was observed for a 10• g/m^3 increase NO_2 (lag 0-5). The strongest effect was observed on respiratory mortality for $PM_{2.5}$ and NO_2 (10.66%; CI 1.86-20.23 and 7.17%; CI 0.89-13.85, respectively at lag 0-5). The effect on mortality was lower, but with similar pattern, for PM_{10}.
Conclusions: We confirmed a high risk of health effects due to air pollution in COPD patients. The strongest effect was for respiratory mortality in relation to $PM_{2.5}$ and NO_2. The estimates doubled respect those previously observed in Rome in the general population; however a more formal comparison will be done with the non-COPD population.