

THE EFFECTS OF PARTICULATE AIR POLLUTION ON HOSPITAL ADMISSIONS FOR CARDIAC DISEASES IN POTENTIALLY SENSITIVE SUBGROUPS. A MULTICITY CASE-CROSSOVER ANALYSIS

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Backgrounds and aims. Several studies have shown that particulate air pollution with aerodynamic diameter less than 10 micrometers (PM_{10}) is associated with increased risk of hospital admissions for cardiovascular causes. However, only few studies focused on subgroups of population especially susceptible to these effects. The objective of the present study was to estimate the short-term association between PM_{10} and cardiac hospital admissions, and to identify susceptible groups.

Methods. A "time-stratified" case-crossover study was carried out in 9 Italian cities from 2001 to 2005. The associations between daily PM_{10} and all cardiac diseases (CD), acute coronary syndrome (ACS), arrhythmias and conduction disorders (ACD), and heart failure (HF) were estimated for hospitalizations of 65+ year-old subjects. The effect modification was assessed assuming age, gender and hospital diagnoses from the previous two-years as susceptibility factors.

Results. A total of 167,895 hospitalizations of 65+ year old with a diagnosis of cardiac diseases were considered. The excess risk of CD was 1.03% (95% confidence interval: 0.69-1.38) per 10 $\mu g/m^3$ PM_{10} at lag 0 and was lower on the following days. The effect was slightly higher for HF (1.37%; 0.74%-2.00%, lag 0) and ACS (1.13%; 0.37%-1.89%, lag 0-1) than for ACD (1.00%; 0.22%-1.78%, lag 0). Women were at higher risk of PM_{10} -related HF admissions (1.99%; 1.17%-2.82%; p-interaction = 0.022) and 75-84-year-old subjects were at higher risk of ACS admissions (2.61%; 1.49%-3.75%; p-interaction = 0.001). Previously diagnosed hypertension, arrhythmias and heart failure were suggested as effect modifiers of the PM_{10} -heart failure association.

Conclusions. An important effect of PM_{10} on hospitalizations for cardiac diseases was found in Italian cities. Women, 75-84 year-old subjects and subjects with previous cardiovascular diseases were susceptible to the PM_{10} effects.