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Susceptibility factors to ozone-related mortality: a population-based case-crossover analysis.

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Abstract

RATIONALE: Acute effects of ozone on mortality have been extensively documented in clinical and epidemiological research. However, only a few studies have focused on subgroups of the population especially vulnerable to these effects.

OBJECTIVES: To estimate the association between exposure to ozone and cause-specific mortality, and to evaluate whether individual sociodemographic characteristics or chronic conditions confer greater susceptibility to the adverse effects of ozone.

METHODS: A case-crossover analysis was conducted in 10 Italian cities. Data on mortality were collected for the period 2001 to 2005 (April-September) for 127,860 deceased subjects. Information was retrieved on cause of death, sociodemographic characteristics, chronic conditions from previous hospital admissions, and location of death. Daily ozone concentrations were collected from background fixed monitors.

MEASUREMENTS AND MAIN RESULTS: We estimated a 1.5% (95% confidence interval [CI], 0.9-2.1) increase in total mortality for a 10 microg/m³ increase in ozone (8-h, lag 0-5). The effect lasted several days for total, cardiac and respiratory mortality (lag 0-5), and it was delayed for cerebrovascular deaths (lag 3-5). In the subgroup analysis, the effect was more pronounced in people older than 85 years of age (3.5%; 95% CI, 2.4-4.6) than in 35- to 64-year-old subjects (0.8%; 95% CI, -0.8 to 2.5), in women (2.2%; 95% CI, 1.4-3.1) than in men (0.8%; 95% CI, -0.1 to 1.8), and for out-of-hospital deaths (2.1%; 95% CI, 1.0-3.2), especially among patients with diabetes (5.5%; 95% CI, 1.4-9.8).

CONCLUSIONS: A greater vulnerability of elderly people and women was indicated; subjects who died at home and had diabetes emerged as especially affected.