ABSTRACT E-BOOK

Theme: **Air quality health effects**

P-0003

Exposure to particulate matter and risk of amyotrophic lateral sclerosis: A case-control study in Northern Italy

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Background: Amyotrophic lateral sclerosis (ALS) is progressive neurodegenerative disease with still unknown etiology. Role of occupational and environmental risk factors has been investigated, including outdoor air pollutants, which have been recently associated to an excess disease risk. We carried out a case-control study in order to assess if environmental exposure to particulate matter ≤10 μm (PM10) may increase ALS risk. Methods: We recruited patients referred to the Modena Neurology Unit between 1994-2015 and controls from the Modena province population. Using a validated geographical information system-based dispersion model, we geocoded subjects' addresses of residence at the time of diagnosis and we estimated outdoor air PM10 concentrations for each subjects. We computed odds ratio (OR) and 95% confidence interval (CI) of ALS according to increasing PM10 exposure, using an unconditional logistic regression model age- and sex-adjusted. Results: For the 132 study participants (52 cases/80 controls), mean of annual average and maximum PM10 concentrations were 5.2 and 38.6μg/m^3, respectively. Using fixed cutpoints at 5, 10 and 20 of average annual PM10 concentrations, compared with subjects <5μg/m^3, we did not find evidence for an excess ALS risk associated with PM10 exposure, since OR was 0.87 (95% CI 0.39-1.96), 0.94 (0.24-3.70), and 0.87 (0.05-15.01) at 5-10, 10-20 and ≥20μg/m^3, respectively. Using maximum annual PM10 concentrations, we found an excess ALS risk for subjects exposed at 10-20μg/m^3 (OR=4.27, 0.69-26.51) compared with exposure below 10μg/m^3, although the risk tended to decrease at higher PM10 concentrations, with OR of 1.49 (0.39-5.75) at 20-50, and 1.16 (0.98-4.82) at ≥50μg/m^3. Conclusions: Our findings do not suggest that PM10exposure is associated with ALS risk. However, some evidence of an increased risk associated with maximum annual exposure concentrations, although statistically imprecise, suggests the need of further investigations, also considering the high concentrations of particulate matter characterizing Northern Italy.

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