

Fine particulate matter related to multiple sclerosis relapse in young patients

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Abstract

Objective: Particulate matter (PM) of aerodynamic diameter smaller than 10 µm (PM10) has been associated with multiple sclerosis (MS) relapse. However, the impact of smaller PM with a greater ability to penetrate human organism has never been assessed. We evaluated the impact of PM smaller than 2.5 µm (PM2.5) on the risk of MS relapse.

Material and methods: In a case-crossover study, we included 2109 consecutive hospitalizations for MS relapse in day hospital in 5 MS centers in the Paris area from January 2009 to December 2013. For each hospitalization, the natural logarithm of the average weekly PM2.5 concentrations (µg/m³) at the patient's residence address during each of the six weeks (week[0] to week[-5]) preceding admission was compared with the concentration during the previous week, using a conditional logistic regression adjusted on temperature, flu like syndrome rate, pollen count, and holiday period.

Results: PM2.5 average concentration during week[-3] was significantly associated with the risk of hospitalization for MS relapse (OR=1.21 [CI 1.01;1.46]). The association was stronger in patients younger than 30 years (OR=1.77 [CI 1.10;2.83]).

Conclusion: Our study demonstrates for the first time an association between exposure to PM2.5 and MS relapse, particularly in young people.