SHORT-TERM IMPACT OF AMBIENT AIR POLLUTION ON BLOOD PRESSURE AMONG PREGNANT WOMEN: A LONGITUDINAL STUDY

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Background and Aims. Epidemiological studies have reported inconsistent findings for the association between air pollution levels and blood pressure (BP), which has mainly been studied in elderly participants. Sort-term air pollution effects on BP have never been investigated in pregnant women, who may constitute a vulnerable population.
Methods. Between 2002 and 2006, 1,500 pregnant women from a mother-child cohort conducted in Nancy and Poitiers, France, underwent 11,220 repeated BP measurements (average, 7.5 measurements/woman). Nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter below 10µm (PM_{10}), and meteorological variables were measured on an hourly basis at permanent monitoring sites. Changes of BP in relation to short-term variations of air pollution were studied with mixed models adjusted for meteorology and personal characteristics.
Results. Elevated NO_2-levels 1 and 5 days and averaged over 7 days before the BP measurement were associated with reduced SBP. The strongest decrease was observed for the 7-day NO_2 average (percent change for a 10.7 µg/m³ increase in NO_2: -0.38%; 95%-confidence intervals: [0.62;-0.02%]). PM_{10} effects on SBP differed according to pregnancy trimester: 7-day averages of PM_{10} were associated with SBP increases during the first trimester (0.60% [0.09;1.11%]) and SBP decreases in the second (-0.55% [-0.91;-0.19%]) and third trimester (-0.35% [-0.69;-0.02%]) of pregnancy.
Conclusions. We observed NO_2 and PM_{10} effects on BP in pregnant women. Whether such changes in BP may have clinical implications remains to be investigated.