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. Short-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.