

TPS 731: Neurological effects in children, Exhibition Hall, Ground floor, August 26, 2019, 3:00 PM - 4:30 PM

Organochlorine pesticides (OCPs) are environmental contaminants that persist in the environment, and previous studies have shown associations between prenatal OCP exposure and subsequent neurodevelopment. However, it is still not clear how long this association could be prolonged. A prospective birth cohort study was conducted to examine the associations between prenatal OCP exposure and intelligence at 7 years children. Blood samples were analyzed using gas chromatography/mass spectrometry techniques to quantify 29 OCPs. The Wechsler Intelligence Scale for Children 3rd edition (WISC-III) was used to assess intelligence of children, which provided Verbal IQ (VIQ), Performance IQ (PIQ), and Full Scale IQ (FIQ). The test also has four subscales to represent more narrow domains of cognitive functions. We analyzed data from 95 singleton children without congenital anomalies, and who had both maternal OCP levels and WISC-III data. After multiple regression analysis adjusted by maternal age, education, parity, blood sampling period, children sex, we found OCPs had negative association with FIQ and PIQ, and positive association with VIQ. When prenatal total dioxin TEQ level was added to adjustment, however, positive associations between OCPs and VIQ disappeared, and negative association between FIQ and p,p'-DDD (β =-10.8: 95% Confidence Interval: -18.6 -2.9), p,p'-DDT (-19.26: -31.4 -7.1), and between PIQ and p,p'-DDD (-10.8: -18.6 -2.9), p,p'-DDT (-19.3: -31.4 -7.1) were remained. In the same analysis for subscale, the Perceptual Organization Index decreased with p,p'-DDD (-12.2: -20.2 -4.3), p,p'-DDT (-22.4: -34.6 -10.2), and Parlar-26 (-11.2: -21.7 -0.7). Additionally, Freedom from Distractibility Index, which reflects attention or working memory, decreased with p,p'-DDD level (-8.8: -16.8 -0.8). Although careful consideration is needed regarding other influential factors, and causal relationship between prenatal exposure to low-level OCPs and cognitive function of school aged children, prenatal OCP level may have prolonged effect on the children's intelligence, especially perception, and attention or working memory.

Tropical cyclone exposure and risk of emergency Medicare hospital admissions for cardiorespiratory diseases in 175 United States counties, 1999-2010

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OPS 12: Morbidity effects of high and low temperatures, Room 315, Floor 3, August 28, 2019, 10:30 AM - 12:00 PM

BACKGROUND / AIMS

While injury risks during tropical cyclones (TCs) have been well characterized through traditional surveillance, little is known about TCs' non-injury morbidity impacts. The elderly might be at particularly high risks of such impacts given heightened prevalence of chronic diseases.

METHODS

We used Medicare claims for 1999–2010 in 180 eastern United States (US) counties to investigate how emergency cardiorespiratory hospital admissions changed during TC exposures. As a primary exposure metric, we classified counties as exposed to TCs when storm-associated maximum sustained winds were ≥ 21 m/s at the county center. We also explored several secondary exposure metrics including using other wind thresholds or storm hazards (rain, floods, tornadoes). For each combination of exposure metric and disease outcome, we estimated how hospitalization risks evolved from two days before to seven days after

the storm's closest approach to the county using distributed lag generalized linear mixed models.

RESULTS

For 1999–2010, 74 TCs passed within 250 kilometers of eastern counties, and 175 study counties had at least one storm exposure. Cardiovascular hospitalizations decreased on the day of storm's closest approach, followed by a significant increase on following days. Respiratory hospitalizations increased immediately and were even higher on the two days following the storm. From two days before to seven days after the storm, cardiovascular hospitalizations increased 3% (95% confidence interval [CI]: 2, 5%) and respiratory hospitalizations increased 16% (CI: 13, 20%) compared to matched unexposed periods. Risks varied across storm exposures, with evidence that risks were higher during more severe wind exposures.

CONCLUSIONS

These findings add two important insights on TCs' health impacts among the elderly: first, emergency hospital admissions due to non-injury morbidity (cardiovascular and respiratory diseases) increase significantly during TC exposures; and second, intense wind exposures may be particularly important in identifying TC exposures with high-risk for these outcomes.

Acute effects of personal exposure to fine particulate matter on blood pressure: results from the AIRLESS Study

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OPS 45: Cardiometabolic effects of air pollution, Room 117, Floor 1, August 26, 2019, 10:30 AM - 12:00 PM

Background and Aim

Evidence on the relationship between exposure to fine particulate matter (PM2.5) and blood pressure (BP) is inconsistent. We aimed to examine the acute effects of personal exposure to PM2.5 on BP in populations.

Methods

During Nov-Dec 2016 (winter) and May-Jun 2017 (summer), 251 participants aged 40-70 years living in an urban (N=123) or a rural (N=128) site of Beijing were enrolled into a panel study (AIRLESS). Personal exposures to PM2.5 were measured for 7 consecutive days in each season with a personal air monitor (PAM). The PAM measurements have been validated by comparison against stationary reference monitors. Twelve seated BP measurements were taken across 4 visits at the clinics for each participant (2 visits to the clinics at Day 3 and 7 per the week-long campaign). The association between PM2.5 and BP was examined with a linear mixed-effects model adjusting for demographic, socioeconomic status (SES) and lifestyle parameters, temperature and relative humidity.

Results

The weekly mean concentrations (standard deviation [SD]) of personal exposure to PM2.5 during winter and summer campaign were 33.8(18.9) and 28.7(9.9) $\mu\text{g}/\text{m}^3$ in participants of the urban site and 64.1(35.4) and 34.3(12.3) $\mu\text{g}/\text{m}^3$ of the rural site, respectively. Preliminary analyses indicate that increased personal exposure to PM2.5 (per interquartile range [IQR] increase: 26.1-29.1 $\mu\text{g}/\text{m}^3$) during the prior 1-3 days was significantly associated with elevated systolic BP ranging from 1.0 (95% Confidence Interval: 0.3-1.6) to 1.4 mmHg