New studies focus on hypertension in pregnant women and children

November 7 2015

Research is revealing new insights related to hypertension in pregnant women and children. Some of the latest findings will be presented at ASN Kidney Week 2015 November 3-8 at the San Diego Convention Center in San Diego, CA.

In one study, Brian Sykes, MD (Nemours/A.I. duPont Hospital) and his colleagues assessed the extent of hypertension diagnoses in overweight and obese adolescents cared for by a large health care system. By examining electronic medical records within the Nemours Health Care System, they identified 6604 youth who were aged 12 to 17 years, had a BMI above the 85th percentile, and had more than 3 documented blood pressure readings above 120/80 mm Hg between 2010 and 2014. Only 255 (3.8%) of these received a diagnosis of hypertension during the study period, while 6349 (96.2%) were undiagnosed. Patients who were undiagnosed had lower BMIs and blood pressure readings and were less likely to be African American, have Medicaid, or be seen by subspecialists who manage blood pressure monitoring and treatment.

"In a large pediatric health care system, hypertension in overweight and obese adolescents remains under-diagnosed despite evidence supporting both as independent risk factors for cardiovascular disease," said Dr. Sykes. "It is crucial that additional resources and future efforts focus on improving detection and early recognition of hypertension in order to reduce cardiovascular morbidity and mortality in this at-risk population." Potential initiatives might include alert flags in electronic medical records for this at-risk population and additional educational workshops

or seminars for clinicians.

In another study, Alison Sanders, PhD (Icahn School of Medicine at Mount Sinai) and her colleagues examined whether lead exposure in pregnancy or in infancy might predict higher blood pressure in 4-year-old children. They conducted the study because lead can be toxic to the kidney, which plays an important role in controlling blood pressure. The analysis included 397 children and their mothers, with maternal blood samples previously collected at the 2nd trimester, 3rd trimester, and at delivery, and children's blood samples collected at birth, 1 year, and 2 years of age.

The team found that exposure in pregnancy was linked with higher blood pressure in young children but exposure in infancy did not seem to impact later blood pressure.

"There is growing awareness that adult hypertension has origins in childhood. These findings support the role of lead exposure in the developmental origins of disease, possibly even adult hypertension," said Dr. Sanders. "If so, the prenatal period may be a susceptible window for the development of mechanisms that regulate blood pressure and may be an appropriate time frame during which interventions to prevent hypertension should occur."

Another group investigated the effects of cell-derived microparticles (MPs) in the development of preeclampsia, which occurs when a pregnant woman develops high blood pressure and protein in the urine. MPs have been associated with pregnancy complications but their causative role for the disease outcome is not known.

Shrey Kohli from a team led by Berend Isermann (Otto-von-Guericke University, Magdeburg, Germany) found that procoagulant MPs can cause fetal death, preeclampsia, and embryonic growth restriction in

mice along with placental abnormalities. These MP-induced changes are also associated with inflammation in the placenta and kidney abnormalities.

The only way to cure preeclampsia is to deliver the baby, which can be very dangerous if performed early. "In our study we established a role of MPs in pregnancy and their importance in the disease state and we employed different ways to prevent the damage caused due to MPs during pregnancy," said Kohli. "This provides relevant drug targets and potential new therapeutics."

More information: 1) "Under-Diagnosis of Hypertension in a Large Cohort of Overweight/Obese Adolescents" (Abstract SA-PO666),

2) "Effect of Prenatal and Childhood Lead Exposure on Blood Pressure at 4 Years of Age" (Abstract SA-PO644),

3) "Microparticles Cause Preeclampsia and Kidney Injury by Activation of Inflammasome in the Placenta" (Abstract 2023)

Provided by American Society of Nephrology