Mom’s BPA Exposure Linked to Behavior Problems in Tots

By Nancy Walsh, Staff Writer, MedPage Today
October 24, 2011

MedPage Today Action Points

• Explain that in utero exposure to the organic compound bisphenol A (BPA), widely used in the manufacture of plastics, including cups and food containers, was associated with behavior disruptions at age 3, particularly among girls.

• Note that increased gestational exposure to BPA also was associated with higher depression scores in girls, even after adjusting for confounders.

Review

In utero exposure to the organic compound bisphenol A (BPA) -- widely used in the manufacture of plastics, including cups, food containers, and even credit card receipts -- was associated with behavior disruptions at age 3, particularly among girls, researchers found.

For each tenfold increase in gestational urinary BPA concentration, there was an adjusted increase in anxiety scores (β=7, 95% CI 1.7 to 12) among a cohort of 244 children, according to Joe M. Braun, PhD, of the Harvard School of Public Health in Boston, and colleagues.

The increase was pronounced among girls (β=12, 95% CI 4.7 to 20) but minimal among boys (β=1.3, 95% CI –5.8 to 8.4), the researchers reported online in Pediatrics.

They urged, however, that their finding of a stronger association for girls be interpreted with caution because of their "modest" sample size and low statistical power to test for this interaction.

Exposure to BPA is virtually universal in industrialized countries; the compound is present not only in food packaging but also in other products such as dental sealants, thermal paper that cash register and credit card receipts are printed on, and medical equipment.

Concerns have been raised about the public health impact, because the compound's
endocrine-disrupting properties have been demonstrated in animals.

But previous research has suggested that avoiding food packaged in plastic may lessen the impact, advice that was echoed by Braun and colleagues.

"BPA exposure can be reduced by avoiding canned and packaged foods, receipts, and polycarbonate bottles with the recycling symbol 7," they stated.

Braun and colleagues had previously found that gestational exposure was associated with hyperactivity and aggressive behavior in girls age 2, but whether the neurobehavioral changes persist with further development has remained uncertain.

So they analyzed data from mothers and offspring at 3 years of age in a prospective birth cohort, the Health Outcomes and Measures of the Environment Study.

Maternal urine samples were obtained during pregnancy weeks 16 and 26, and the children's samples were obtained yearly.

Behavior was evaluated with the Behavior Assessment System for Children 2, with particular attention to subscales rating anxiety, depression, aggression, hyperactivity, and attention.

Their executive function was assessed on the Behavior Rating Inventory of Executive Function-Preschool, focusing on emotional control, planning, memory, and ability to inhibit behavioral responses and to shift between tasks.

After adjusting for confounders including maternal race, education, income, and marital status, as well as other exposures such as tobacco, the researchers found that each tenfold increase in gestational urinary BPA was associated with higher scores for depression, most notably in girls:

- All children, $\beta = 4$ (95% CI 0 to 9.9)
- Girls, $\beta = 11$ (95% CI 3.6 to 18)
- Boys, $\beta = -0.5$ (95% CI -7.2 to 6.2)

Similarly, hyperactivity scores were increased in girls ($\beta = 9.1$, 95% CI 3.1 to 15) and not in boys ($\beta = -6.3$, 95% CI -12 to -0.6), the researchers reported.

Each tenfold increase in gestational urinary BPA also was associated with higher scores among the girls for problems with emotional control ($\beta = 9.1$, 95% CI 2.8 to 15) but not among boys ($\beta = 1.1$, 95% CI -5.1 to 7.2).

In contrast to gestational exposure, childhood exposure to BPA did not appear to influence these neurobehavioral functions.

"Gestational BPA exposures might affect endocrine or other neurotransmitter pathways and disrupt sexual differentiation of the brain, to alter behavior in a gender-
dependent manner," Braun and colleagues observed.

They recommended that further research explore whether boys and girls are susceptible to exposure at different levels or during different phases of development.

They also noted that there may be as-yet-unidentified confounding factors, despite their efforts to control for numerous environmental factors.

The clinical significance of these findings, while "intriguing," are not yet certain, particularly considering the ubiquity of BPH, Braun's group acknowledged.

The authors declared that they have no financial conflicts of interest.

Primary source: Pediatrics
Source reference:

Disclaimer
The information presented in this activity is that of the authors and does not necessarily represent the views of the University of Pennsylvania School of Medicine, MedPage Today, and the commercial supporter. Specific medicines discussed in this activity may not yet be approved by the FDA for the use as indicated by the writer or reviewer. Before prescribing any medication, we advise you to review the complete prescribing information, including indications, contraindications, warnings, precautions, and adverse effects. Specific patient care decisions are the responsibility of the healthcare professional caring for the patient. Please review our Terms of Use.