

# Higher urinary levels of commonly used chemical, BPA, linked with cardiovascular disease, diabetes

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Higher levels of urinary Bisphenol A (BPA), a chemical compound commonly used in plastic packaging for food and beverages, is associated with cardiovascular disease, type 2 diabetes and liver-enzyme abnormalities, according to a study in the September 17 issue of *JAMA*. This study is being released early to coincide with a Food and Drug Administration (FDA) hearing on BPA.

BPA is one of the world's highest production-volume chemicals, with more than two million metric tons produced worldwide in 2003 and annual increase in demand of 6 percent to 10 percent annually, according to background information in the article. It is used in plastics in many consumer products.

"Widespread and continuous exposure to BPA, primarily through food but also through drinking water, dental sealants, dermal exposure, and inhalation of household dusts, is evident from the presence of detectable levels of BPA in more than 90 percent of the U.S. population," the authors write. Evidence of adverse effects in animals has created concern over low-level chronic exposures in humans, but there is little data of sufficient statistical power to detect low-dose effects. This is the first study of associations with BPA levels in a large population, and it explores "normal" levels of BPA exposure.

David Melzer, M.B., Ph.D., of Peninsula Medical School, Exeter, U.K.,

and colleagues examined associations between urinary BPA concentrations and the health status of adults, using data from the National Health and Nutrition Examination Survey (NHANES) 2003-2004. The survey included 1,455 adults, age 18 through 74 years, with measured urinary BPA concentrations.

The researchers found that average BPA concentrations, adjusted for age and sex, appeared higher in those who reported diagnoses of cardiovascular diseases and diabetes. A 1-Standard Deviation (SD) increase in BPA concentration was associated with a 39 percent increased odds of cardiovascular disease (angina, coronary heart disease, or heart attack combined) and diabetes.

When dividing BPA concentrations into quartiles, participants in the highest BPA concentration quartile had nearly three times the odds of cardiovascular disease compared with those in the lowest quartile. Similarly, those in the highest BPA concentration quartile had 2.4 times the odds of diabetes compared with those in the lowest quartile.

In addition, higher BPA concentrations were associated with clinically abnormal concentrations for three liver enzymes. No associations with other diagnoses were observed.

"Using data representative of the adult U.S. population, we found that higher urinary concentrations of BPA were associated with an increased prevalence of cardiovascular disease, diabetes, and liver-enzyme abnormalities. These findings add to the evidence suggesting adverse effects of low-dose BPA in animals. Independent replication and follow-up studies are needed to confirm these findings and to provide evidence on whether the associations are causal," the authors conclude. "Given the substantial negative effects on adult health that may be associated with increased BPA concentrations and also given the potential for reducing human exposure, our findings deserve scientific follow-up."

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