

News Summary

OR33-3: Bisphenol A exposure increases risk of abnormal heart rhythms in female rodents

The chemical bisphenol A, commonly found in many plastic household items, has been linked to yet another health problem in animals—an increased frequency of arrhythmias, or heartbeat irregularities, a new study found. The results, seen only in females, will be presented Saturday at The Endocrine Society's 91st Annual Meeting in Washington, D.C.

Past animal studies show that bisphenol A, or BPA, can have harmful effects on the reproductive, nervous and immune systems. Also, a study in humans reported last year found an increased prevalence of cardiovascular disease in people with high levels of BPA in the urine.

However, the effects of BPA on the heart are unknown, said study co-author Scott Belcher, PhD, associate professor in the University of Cincinnati's Department of Pharmacology and Cell Biophysics.

In the new study, funded by the National Institutes of Health, the University of Cincinnati researchers found that low-dose BPA and estrogen can act alone or in combination to increase harmful arrhythmias in female rats and mice. Because BPA has properties similar to the main female hormone estrogen, it is considered an "environmental estrogen."

Mice and rats in the study had normal heart rhythms at baseline, before administration of BPA or estrogen (estradiol), Belcher said. The investigators studied heart rhythms in both the working heart and in cultured heart muscle cells. In both models, exposure to BPA increased the frequency of arrhythmias, compared to baseline, in females but not in male animals, the authors found. Administration of estrogen alone also increased the frequency of arrhythmias in females.

Arrhythmias were most frequent in the female rats and mice when they received both BPA and estrogen, at levels normally found in female humans.

"We have identified a new possible risk for female heart health, caused by increased levels of estrogens in the body and exposure to the environmental estrogen BPA," Belcher said.

BPA is found in polycarbonate-plastic baby bottles, refillable water bottles and food containers as well as the linings of metal food cans. Last year the U.S. Food and Drug Administration said more research on the safety of BPA is needed.

Arrhythmias occur when the heart beats too slowly or too fast or when it skips heartbeats. These heart rhythm irregularities can cause fatigue, lightheadedness, fainting or sudden cardiac death. If a fast heart rate affects the heart's ability to pump, it can cause a heart attack.

The study's lead author, Hong-Sheng Wang, PhD, assistant professor at the University of Cincinnati, will present the results.

###