



New Studies Link BPA to Heartbeat and Fertility Problems

By Rory Harrington

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Fresh research linking bisphenol A (BPA) to heart beat disorders and fertility problems have added to the growing weight of opinion questioning the safety of the chemical.

BPA is used to make hard, clear plastics for food containers, dental sealants and the sealants that line food and beverage cans. Concern over the chemical has been rising in the US resulting in it being banned in two states and an announcement from the Food and Drug Administration to review its opinion that BPA is safe.

Two new studies presented this week at the Endocrine Society's annual meeting in Washington are sure to add to the controversy surrounding the chemical.

Irregular heartbeat

A study by a team at the University of Cincinnati (UC) found that exposure to BPA and/or estrogen causes abnormal activity in the hearts of female rats and mice. The group, lead by associate professor of pharmacology Scott Belcher, said that estrogen receptors are responsible for this effect in heart muscle cells.

Belcher said: "There is broad exposure to bisphenol A, despite recognition that BPA can have harmful effects. We had reason to believe that harmful cardiovascular affects can be added to the list."

The scientists said live cultures of cardiac cells isolated from rat or mouse hearts were briefly exposed to BPA and/or estrogen. It found the reaction in terms of heartbeat was sex-specific to women.

"Both compounds caused striking changes in the activity of cardiac muscle cells from females but not males," said a UC statement. "Additional studies revealed that these cellular changes in activity caused improperly controlled beating in the female heart."

Belcher added: "Basically, it's very clear that BPA is acting like estrogen. If we give estrogen at physiological concentrations, then add BPA, it's actually a synergistic effect. It's not like adding the two together. It's worse."

A second study presented by Yale University School of Medicine's reproductive endocrinology team claimed to show adverse effects on fertility in rodents following exposure to BPA.

Gene altering

The group, led by Professor Hugh Taylor, injected pregnant mice with a low dose of the chemical. After the animals gave birth, the scientists analyzed the uterus of female offspring and extracted DNA. They found that BPA contact during pregnancy had a lasting effect on one of the genes that is

responsible for uterine development and subsequent fertility in both mice and humans (HOXA10).

"The genes that are necessary for normal pregnancy are altered," said Taylor, adding BPA changed the DNA code and the ability of DNA to express these genes.

He said: "A little transient exposure during a brief time period in pregnancy could permanently alter the DNA of the uterus.

"We don't know what a safe level of BPA is, so pregnant women should avoid BPA exposure. There is nothing to lose by avoiding items made with BPA-and maybe a lot to gain."

Research techniques questioned

But the American Chemistry Council (ACC) rejected the validity of the studies, accusing the authors of "bypassing the scientific process in favor of sensational press releases" and as "a scare tactic that will not promote public health".

Steven G. Hentges, of the ACC, said: "It is disappointing to see that some researchers continue to inject animals with bisphenol A since this experimental technique has recently been acknowledged by the National Institute of Environmental Health Sciences to have very limited value for assessing human health effects. In addition, studies on cell cultures are unlikely to be directly relevant to human health and, unless and until such relevance is scientifically validated, should not be presented as evidence of health risks."