

Bisphenol A in Food Packaging Again Linked to Heart Disease

February 28, 2012 (Exeter, United Kingdom) — Further evidence indicates that bisphenol A (BPA), a chemical found in plastics often used in the food industry, is linked to heart disease. [1].

Lead researcher of the current paper, Dr David Melzer (Peninsula College of Medicine and Dentistry, Exeter, UK), commented: "This is the third time that BPA has been statistically linked to CHD (chronic heart disease). I am slightly stunned that this association has come up every time."

He added: "Although there are five billion people around the world ingesting this stuff, we have very little data on its effects in humans. Safety studies were done in rats and mice, but in these animals BPA is excreted quite quickly through the bile. In humans, however, it is excreted through the kidneys. You have to ask why the safety studies were done in rodents when there is such a basic difference here. It is time to do proper drug-style safety studies in humans."

In their paper, which was published online February 21, 2012 in *Circulation*, Melzer and his colleagues note that BPA is one of the world's highest-production-volume chemicals. "The population is exposed to BPA primarily through packaged food and drink, but also through drinking water, dental sealants, exposure to the skin, and the inhalation of household dust," they write. Melzer added: "BPA is found in polycarbonate, which is used in the lining of tin cans and in certain plastics to make them more resilient, such as reusable drink bottles. It tends to leech out more when the plastic is heated, so it is advisable not to warm food in hard plastic containers that might contain polycarbonate."

The latest research used data from a 10-year follow-up of the UK EPIC-Norfolk cohort study and shows that higher urinary concentrations of BPA metabolites are associated with an increased risk of developing coronary artery disease.

This builds on two analyses of data from the US NHANES study, which have previously identified an association between BPA and cardiovascular disease. Melzer explained that the cross-sectional design of the NHANES studies meant that they were effectively "snapshots in time" and that it was theoretically possible that patients with heart disease might have changed their diet and therefore incidentally increased their BPA exposure. "However, the prospective design of the current study shows that such reverse causation cannot account for the association between BPA and coronary disease."

In the current study, the researchers conducted a nested case-control analysis of patients in the EPIC-Norfolk study. They compared baseline urinary BPA concentrations from 758 participants who had gone on to develop cardiovascular disease (cases), and 861 individuals who had remained free from heart disease (controls).

Results showed an 11% increase in risk of developing coronary heart disease with each standard-deviation increase in BPA concentration after adjustment for other factors associated with heart disease.

This is a smaller trend toward harm than suggested by the NHANES data (which showed a 30% to 40% increase in risk per standard-deviation increase in BPA), but BPA concentrations in the UK study (median value 1.3 ng/mL) were much lower than the US study (2.7 ng/mL). "In the two NHANES studies we found an almost identical risk. The EPIC study is a bit weaker, but we took only one urine sample with a 10-year follow-up, so you would expect only a weak association," Melzer commented.

He says the possible mechanism behind this association is unknown, but he points out that BPA binds to estrogen receptors, and laboratory studies have shown it can induce liver and oxidative cellular damage, disrupt pancreatic cell function, and have obesity-promoting effects, all of which could plausibly contribute toward CAD (coronary artery disease) risk.

References

1. Melzer D, Osborne NJ, Henley WE, et al. Urinary bisphenol: A concentration and risk of future coronary artery disease in apparently healthy men and women. *Circulation* 2012; DOI: 10.1161/CIRCULATIONAHA.111.069153. Available at: <http://circ.ahajournals.org>

Editor's Note:

Several countries, for example Canada, the EU states, and even China, have banned the use of BPA in plastics used for food packaging or storage (at least partially – in children's products). Plastics producers and the US Food & Drug Administration claim that there is not enough evidence to initiate a ban in the US, and congressional debate over tougher food safety legislation has been delayed.