Bisphenol A – a long-used component of polycarbonate plastics, is one of the most studied chemicals in the world. Even the ultra-cautious FDA has declared it safe for people as used. But some scientists have built a career by screaming about how dangerous it is, so we have another paper. Enough already.

One would think that the FDA's issuance of the CLARITY-BPA Core Study, a two-year exhaustive examination of the effects of the plastic component bisphenol-A (BPA) on rats might have finally put an end to the hysteria surrounding a chemical that has been used since the 1950s.

One area that has been of significant consumer interest is the use of Bisphenol A (BPA) in food packaging. BPA is authorized for use in polycarbonate plastics and epoxy resins in certain food and beverage can linings. Given this interest, the FDA has routinely considered and evaluated the scientific evidence surrounding the use of BPA and continues to conclude that BPA is safe for the currently authorized
uses in food containers and packaging.
U.S. Food and Drug Administration  Feb 23, 2018

One would be wrong.

In a paper [2] entitled "BPA: have flawed analytical techniques compromised risk assessments?" which was published in the December 5th issue of The Lancet Diabetes & Endocrinology, three authors from Washington State University, one of them being Frederick vom Saal (1), try yet another approach to convince us all that BPA, which is primarily used as a sealer/liner in canned food (it keeps you from getting botulism poisoning, etc.) is putting life on earth at risk by "disrupting" our endocrine systems.

The premise of the paper is that BPA has traditionally been measured by an "indirect" assay in which BPA sulfate, and BPA glucuronide, the two major metabolites found in urine, are enzymatically broken down (hydrolyzed) to give free BPA, which is then measured. The authors question the efficiency of the hydrolysis process, saying that this leads to artificially low concentrations.

Instead, the Washington State researches report an analytical method that directly measures both major metabolites in urine without having to go through the enzymatic hydrolysis. The "direct" measurements found that total BPA in urine was 19-44 times higher than measured using older methods. Therefore:

Importantly, because estimates of human exposure have been based almost exclusively on data from indirect methods, these findings provide compelling evidence that human exposure to BPA is far higher than has been assumed previously.

Sorry, I don't buy it.

If anything, in my opinion, the paper may actually reinforce the safety of the chemical. This is because both the indirect and direct techniques are measuring BPA in the urine. Because that's how our bodies work. Our livers are exquisitely designed to convert chemicals and drugs to water-soluble metabolites, which are eliminated in the urine. This process is especially efficient with BPA (2). The authors say just this:

However, rapid metabolism of orally ingested BPA means accurate assessment in humans requires not only measurement of BPA but also of its major conjugated metabolites.

So, I would argue that it makes little or no difference whether standard analytical techniques have
underestimated. This is because:

1. Whatever harm BPA is alleged to cause will not occur when its metabolites, BPA sulfate, and BPA glucuronide, are sitting in your bladder waiting to be eliminated. To screw up your endocrine system the chemical needs to be in blood and body tissues. The rapid metabolism ensures that the chemical does not stay in the body for long.

2. Let's accept that standard analytical methods have indeed been underestimating the concentration of BPA metabolites in urine. So what? This does not mean that we are suddenly ingesting 19-44 times more BPA. No, the exposure hasn't risen. It's just being measured differently. This is conceptually identical to groups like EWG and NRDC reporting the presence of trace amounts of chemicals in the environment or humans and implying that this is something new and dangerous. This is disingenuous and wrong. The chemicals have been there all along. They are now being detected because of the power of modern instrumentation, which can measure chemicals in concentrations that were unimaginable in the past.

The argument that we are somehow at more risk because measurements now show that we have been exposed to more than previously believed is like arguing that if two home runs are awarded every time a batter hits the ball into the seats that hitters are now hitting twice as many home runs as before. If anything, this study says that BPA is 19-44 times safer than we thought. Sound silly?

You bet.

NOTES:

(1) Frederick vom Saal has spent something like seven centuries trying to prove that BPA is a dangerous chemical. Do a Google search of "BPA" and vom Saal and 1940 (!) hits show up. Obsessed much?

(2) Phenols (benzene rings containing a hydroxyl (OH) group) are notoriously poor drug candidates. They are the bane of medicinal chemists doing drug discovery. Why? Because the damn things get turned into glucuronide and sulfates and all your work gets peed away. As the name implies, bisphenol A contains two hydroxyl groups so it is (more or less) twice as bad a drug.

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