Press Release

American Chemical Society
Office of Public Affairs

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Note to journalists: Please report that this research will be presented at a meeting of the American Chemical Society.

Pregnant women and fetuses exposed to antibacterial compounds face potential health risks

SAN FRANCISCO, Aug. 10, 2014 — As the Food and Drug Administration (FDA) mulls over whether to rein in the use of common antibacterial compounds that are causing growing concern among environmental health experts, scientists are reporting today that many pregnant women and their fetuses are being exposed to these substances. They will present their work at the 248th National Meeting & Exposition of the American Chemical Society (ACS), the world's largest scientific society.

The meeting, which takes place here through Thursday, features nearly 12,000 presentations on a wide range of science topics.

"We looked at the exposure of pregnant women and their fetuses to triclosan and triclocarban, two of the most commonly used germ-killers in soaps and other everyday products," says Benny Pycke, Ph.D. "We found triclosan in all of the urine samples from the pregnant women that we screened. We also detected it in about half of the umbilical cord blood samples we took, which means it transfers to fetuses. Triclocarban was also in many of the samples."

Are antibacterial soaps doing more harm than good?

Credit:NatalyaAksenova/iStock/Thinkstock

The problem with this, explains Pycke, a research scientist at Arizona State University (ASU), is that there is a growing body of evidence showing that the compounds can lead to developmental and reproductive problems in animals and potentially in humans. Also, some research suggests that the additives could contribute to antibiotic resistance, a growing public health problem.

Although the human body is efficient at flushing out triclosan and triclocarban, a person's exposure to them can potentially be constant.

"If you cut off the source of exposure, eventually triclosan and triclocarban would quickly be diluted out, but the truth is that we have universal use of these chemicals, and therefore also universal exposure," says Rolf Halden, Ph.D., the lead investigator of the study at ASU.

The compounds are used in more than 2,000 everyday products marketed as antimicrobial, including toothpastes, soaps, detergents, carpets, paints, school supplies and toys, the researchers say.

Showing what effect antimicrobials have on people is a challenge. But Halden and Pycke's colleague Laura Geer, Ph.D., of the State University of New York, found at least one interesting result. Geer says the study yielded a link between women with higher levels of another ubiquitous antimicrobial, butyl paraben, which is commonly used in cosmetics, and shorter newborn lengths. The long-term consequences of this are not clear, but Geer adds that, if this finding is confirmed in larger studies, it could mean that widespread exposure to these compounds could cause a subtle but large-scale shift in birth sizes.

State policymakers, the FDA and industry have taken notice of the mounting evidence against triclosan. Minnesota became the first state to pass a ban on the antimicrobial's use in certain products, and it will take effect in January 2017. Some companies, such as Johnson & Johnson and Procter & Gamble, have announced that they are phasing out the compound from some products. At the federal level, the FDA and Environmental Protection Agency are reviewing the use and effects of the compounds.

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Title
Human biomonitoring of prenatal exposure to triclosan and triclocarban in a multiethnic urban population from Brooklyn, New York

Abstract
Triclosan (TCS) and triclocarban (TCC) are antimicrobial agents formulated in a wide variety of consumer products (including soaps, toothpaste, medical devices, plastics, and fabrics) that are regulated by the U.S. Food and Drug Administration (FDA) and U.S. Environmental Protection Agency. In late 2014, the FDA will consider regulating the use of both chemicals, which are under scrutiny regarding lack of effectiveness, potential for endocrine disruption, and potential contribution to bacterial resistance to antibiotics. Here, we report on environmental exposure to TCS and TCC based on actual consumer use of antimicrobial household products during pregnancy. Using liquid chromatography tandem mass spectrometry, we determined the concentrations of TCS, TCC, and its human metabolites (2'-hydroxy-TCC and 3'-hydroxy-TCC) as well as the manufacturing byproduct (3'-chloro-TCC) as total (Σ-) concentrations in maternal urine and cord blood plasma from a cohort of 181 expecting mother/infant pairs in an urban multiethnic population from Brooklyn, NY recruited in 2007-'09. Σ-TCS was detected in 100% of urine and 51% of cord blood samples. The interquartile range of detected Σ-TCS concentrations in urine were highly similar to those reported previously for the age-matched population of the National Health and Nutrition Examination Survey (NHANES) from 2003/4, but typically higher than those reported for the general population (detection frequency = 74.6%). Urinary levels of Σ-TCC are reported here for the first time from real-world exposures during pregnancy, showing a median concentration of 0.21 μg/L. Urinary concentrations of ∑-TCC correlated with its phase-I metabolite ∑-2'-hydroxy-TCC (r = 0.49) and the manufacturing byproduct ∑-3'-chloro-TCC C (r = 0.79); and ∑-2'-hydroxy-TCC correlated with ∑-3'-hydroxy-TC (r = 0.99). This study presents the first human biomonitoring data for TCC based on actual consumer exposures during pregnancy and provides additional data for environmental exposure to TCS in the maternal-fetal unit for an urban population in the United States.