Study: Chemical may affect genitalia of male babies

Fertility, health problems not clear

By Marla Cone
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Scientists studying the effects of hormone-mimicking chemicals have reported that compounds used in plastics and beauty products and widely found in people seem to alter reproductive organs of baby boys.

In the first study of humans exposed in the womb to the compounds, called phthalates, researchers who examined the genitalia of male babies and toddlers found a strong relationship between the chemicals and subtle changes in the size and anatomy of their genitals. Phthalates are ubiquitous compounds used as softeners in plastics and to maintain color and fragrance in beauty products such as nail polish and perfume.

It is the first time scientists have shown that any industrial compound measured in mothers' bodies seems to disrupt the reproductive systems of their babies.

But many experts, including the authors of the report published Friday in the online version of the journal Environmental Health Perspectives, say more research must be done to determine whether the genital abnormalities lead to fertility or health problems and to prove that they are caused by phthalates.

The findings were based on tests of 85 mothers and sons, averaging nearly 13 months of age, born in Los Angeles, Minneapolis and Columbia, Mo. Mothers with the highest levels of chemicals in their urine late in their pregnancies had babies with a cluster of effects. The span between the babies' anuses and penises, called anogenital distance, was comparatively short, and the infants had smaller penises and scrotums and more instances of incomplete descent of testicles.

Medical experts do not know whether babies with those physical characteristics will later develop reproductive problems. In newborn animals, laboratory studies show that combination of effects can lead to lower sperm counts, infertility, reduced testosterone and testicular abnormalities later in life.

"In rats it's called the phthalate syndrome. What we found for the first time is evidence for this syndrome in humans," said Dr. Shanna Swan, the study's lead researcher and a professor in the Department of Obstetrics and Gynecology at University of Rochester School of Medicine and Dentistry.

The study is the strongest evidence yet that man-made chemicals in the environment can feminize male babies in the womb.

Yet scientists say a larger study of babies should be conducted, and that they should be followed into adulthood to see whether they develop low sperm counts or any other reproductive problems.

"The main thing is, this is a very small group of subjects," said Dr. Catherine Mao, a co-author and pediatric endocrinologist at the Los Angeles Biomedical Research Institute at Harbor-University of California Los Angeles Medical Center. "It is too early to say whether there are long-term effects and whether this (anogenital) measure is important or not in humans."

Reproductive biologists say a shorter anogenital distance is a female-like effect in animals, a telltale sign of decreased male hormones, and that it is likely that the human effects are similar because hormones function the same in animals and people.

If a child has a shorter anogenital distance, "you are very likely going to see changes in every other aspect of masculinization as well," said Frederick vom Saal, a reproductive toxicologist at the University of Missouri at Columbia.

One of the most important findings in the new study, funded by the National Institutes of Health and the EPA, was that the phthalate levels associated with the genital changes "were not unusually high" for the general population.

Nearly everyone in a 1999-2000 survey of 2,500 people throughout the United States had phthalates in their urine, and the effects in the babies were seen at concentrations below those detected in the urine of 25 percent of them, according to the results of the testing by the Centers for Disease Control and Prevention.

Some scientists specializing in reproductive health said finding anatomical changes in infants related to a chemical was disturbing. But Marian Stanley, manager of a phthalates panel at the American Chemistry Council, said the authors did not report any negative health effect on the babies, and that the differences in their genitalia have "no known significance" and could be caused by natural variability, not chemical exposure.