Exposure to household chemical in utero increases risk of childhood eczema

By Loren Grush
Published June 26, 2012 | FoxNews.com

Children whose mothers were exposed to a common household chemical while pregnant were found to have an increased risk of developing eczema.

The chemical – called butylbenzyl phthalate (BBzP) – is typically used in vinyl flooring, artificial leather and other household materials. Exposure typically occurs when the chemical is slowly released into the air and inhaled.

The study, conducted at the Columbia Center for Children’s Environmental Health in New York, was published in the online edition of Environmental Health Perspective. The research called upon previous studies that implicated BBzP with the childhood skin condition.

“This particular chemical is known to be an endocrine disrupter, meaning it interferes with hormone systems,” Allan Just, lead author of the study and postdoctoral researcher at the Harvard School of Public Health, told FoxNews.com. “Previous studies have shown that children with eczema have higher concentrations of this chemical (BBzP) in the dust of their bedroom. But the children had already had eczema. We wanted to look at biomarkers during the prenatal period – a more direct measure of exposure.”

According to the U.S. National Library of Medicine, childhood eczema – also known as atopic dermatitis – is considered a hypersensitivity reaction that causes red, itchy rashes on the skin. The condition is most common in infants, with many people outgrowing the disorder in adulthood.

While hereditary factors and environmental triggers have been linked to the development of eczema, this study is the first of its kind to reveal a prenatal exposure to be associated with the disease.

The researchers examined 407 women, and subsequently, the development of their children. Urine tests were taken from each woman during the third trimester of her pregnancy and analyzed for BBzP. Once the women’s children were born, each woman was asked to describe if their child was ever diagnosed with eczema.

“What we found when comparing women who had higher exposure and lower exposure,” Just said. “We found that women with higher exposure had a relative risk of 1.5 times that of women with lower exposure of reporting that her child had eczema. Meaning it was 52 percent more likely,” Just said.

As for why prenatal BBzP exposure might increase eczema risk, the scientists remain uncertain. Previous theories have linked eczema to allergies. However, Just and his team tested the children for three common household allergens – cockroaches, dust mites and mice – as well as a biomarker that indicates the body’s immune response to allergens. Ultimately they found no link between childhood allergy and eczema.

According to Just, further research is needed to determine the mechanisms by which BBzP may cause eczema in children.

“It’s not really understood, the role of this potential endocrine disruptor,” Just said. “We don’t have a strong mechanistic body of literature to say why we think we found what we found. We do suggest some potential things – these kinds of chemicals interfere with nuclear receptors PPAR,” which help to control the expression of genes, some relating to development. Just explained that a prior animal study has shown PPARs to be important for the development of skin lesions, but BBzP’s direct role has not been examined.

“More mechanistic studies are really needed,” Just added. “The traditional view that eczema is a story of allergy is no longer supported as strongly as conventional wisdom. Most of our children with eczema didn’t have allergy, so there’s something about
this chemical BBzP and eczema that's not necessarily allergic – but could be immunologic.”

While Just called for more research into the inner workings of BBzP, he also equally called for a way to minimize BBzP exposure in the home.

“The women in this study had no special exposures,” Just said. “They weren’t doing anything in their lives that would have caused them to have additional exposure. These chemicals are ubiquitous; they’re in common consumer products, and we found [them] in more than 99 percent of the urines we measured.”

“This chemical is rarely labeled and there’s not much individuals can do to avoid it,” Just added. “There’s really no way to know your level of exposure. We had to do very sophisticated analytic chemistry to measure these levels. We need to develop science and recommendations for people to help reduce their exposure.”