

# Phthalates worsen skin allergies in newborn mice exposed through their mothers.

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Yanagisawa R, H Takano, K Inoue, E Koike, K Sadakane and T Ichinose. 2008. **Effects of maternal exposure to di-(2-ethylhexyl) phthalate during fetal and/or neonatal periods on atopic dermatitis in male offspring.** Environmental Health Perspectives 116:1136–1141.

Synopsis by Benson T. Akingbemi

Newborn male mice exposed to a common phthalate plasticizer (DEHP) through their mothers developed more severe allergic skin reactions to allergens than unexposed mice.

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Research with mice reveals that the phthalate DEHP can increase the severity of allergic reactions in young animals when they are exposed neonatally to the contaminant via their mother's milk.

Rates of allergic skin conditions -- called dermitits -- are increasing in people. Generally, the skin becomes swollen, red and itchy after being exposed to an allergen. These new results may shed light on one of the drivers of this trend.

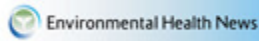
This study suggests that environmental chemicals like DEHP may increase the potency of reactions to allergens and thereby play a role in the development and/or enhancement of allergic diseases. According to the authors: "Our results support the novel hypothesis that maternal exposure to DEHP during neonatal periods via breast milk and/or infant formula may be responsible, at least in part, for the recent increase in atopic dermatitis in offspring."

DEHP is added to plastics, usually to make them flexible. Because of its widespread use in polyvinyl plastics, it is found almost everywhere in the environment. The compound is present in some food packaging, many household products, soft plastic toys, auto upholstery and medical tubing/bags. Exposure occurs through food, water, air and medical procedures in which DEHP-containing products are used. DEHP is a common contaminant of household dust, because it is commonly used in vinyl flooring and in the backing of carpets.

The chemical's link to reproductive effects in lab animals -- specifically infertility and male reproductive defects -- has led the European Union, Canada and the state of California to ban DEHP in toys and infant products.

To expose the developing mice, researchers gave pregnant dams DEHP at 0.8, 4, 20 or 100 micrograms on days 0, 7 and 14 of pregnancy. To expose newborns, a different set of mothers was injected with DEHP at the same doses on days 1, 8 and 15 after birth. The researchers then injected mite allergen into the pups on treatment days 0, 2, 4, 7, 9, 11, 14 and 16. They measured ear thickness, determined disease symptoms (dryness and wounding) and evaluated tissues for signs and severity of a type of skin allergy that resembles eczema.

Dermatitis-like skin problems were worse in newborn mice exposed to 100 micrograms of DEHP through their mothers but not in any of the mice that were exposed while in the womb. The scientist who carried out the research proposed this unexpected pattern could result from the fact that fetal immunity is largely dependent upon the mother's immune system. After birth, the newborn is increasingly dependent upon proper development of its own immune system. These results suggest that this development is adversely affected by DEHP.



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