



## Phthalates May Affect Baby Boys

The results of a recent European study suggest that exposure to phthalates through lactation can trigger the reduction of reproductive hormones in baby boys. This finding supports the hypothesis that the human reproductive organs may be vulnerable to these ubiquitous environmental chemicals.

Traditionally, legislations on chemicals have primarily focused on substances suspected to cause cancer in humans. But in recent years, particular scientific and regulatory attention has been given to the chemicals that can mimic the effects of hormones and disrupt the functions of endocrine (hormonal) system.

The most alarming health impacts of such endocrine disruptors include the effects on reproductive hormones that are crucial for normal development and reproduction. The resulting abnormalities in the balance of these hormones may cause decline in sperm counts, congenital malformations, and retarded sexual development.

Among a number of potential endocrine disruptors, the phthalates are of particular concern because of their ubiquitous presence in the environment. Humans are continually exposed to phthalates that can be found in PVC flooring, children's toys, detergents, personal care products, and diet through food production and packaging processes. Recently, phthalates were also detected in human breast milk raising important questions about the effects of exposure to phthalates in the neonatal phase of development.

Since previous studies on animals showed adverse effects of phthalate exposure to male reproductive hormones, a recent European study has investigated the possible links between the phthalates contamination of human breast milk and the balance of sex-hormones in newborn baby boys.

The contamination by six phthalate monoesters was measured in 130 breast milk samples from Danish and Finnish mothers included in a cohort study conducted from 1997 to 2001. The blood samples of their 3 months old sons were analyzed for sex-hormones. This particular age was chosen because it corresponds to a known post-natal period of growth of sex-hormones concentrations in baby boys.

The results of the study showed that 3-months old boys exposed to higher concentrations of phthalate monoesters in breast milk, showed slight, but significant, decrease in levels of reproductive hormones, including the main male sex-hormone - testosterone.

The range of concentrations of phthalates in breast milk samples appeared to be below the estimates of the tolerable daily intake levels (TDI). However, a direct comparison to TDI values was not possible in this study since exposure through lactation is only one of the possible routes of exposure to phthalates in children.

In discussing their findings, the authors agree that they cannot rule out that other factors associated to the use of phthalates might be responsible for the observed trends in sex-hormone balance. They also argue that their findings should not be used as an argument against breast-feeding, particularly because phthalates have also been found in other nutrition sources for infants.

In any event, this study is the first report showing an association between phthalate exposure and reproductive hormones in boys. As such, it clearly supports the hypothesis that the human reproductive organs may be vulnerable to phthalate exposure during development.

Conscious of the potential threats of phthalates to humans and the environment, the European Commission has recently banned the use of phthalates in toys. However, scientists argue that more efficient regulatory actions will require our full understanding of the mechanisms of actions, routes of exposure and specific impacts of phthalates on human reproduction and development.

**Source:** Main, M.K. et al. (2006) "Human Breast Milk Contamination with Phthalates and Alterations of Endogenous Reproductive Hormones in Infants Three Months of Age", *Environmental Health Perspectives* 114 (1).

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