Published in final edited form as:

Environ Int. 2009 August ; 35(6): 994–995. doi:10.1016/j.envint.2009.03.013.

Human milk biomonitoring of phthalates: Expanding our understanding of infant exposure is compatible with supporting breastfeeding

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Keywords

Biomonitoring; Environmental chemicals; Breastfeeding; Human milk; Risk communication

Improving our understanding of maternal/infant exposure to environmental chemicals is an essential aspect of monitoring the ever-changing types of chemicals of our modern life. Furthermore, risk assessments would be impossible without the best and most reliable data that our current science can provide. Latini et al. (2009) contribute to the database on infant exposures to environmental chemicals via breastfeeding with their recent publication on phthalates in breast milk. However, we wish to comment on the manner in which scientists present data on environmental chemicals in breast milk, as new information on environmental chemicals in breast milk may be interpreted by mothers and others as an indication that breast feeding is unsafe.

Phthalates are an interesting case study for developing information on balancing risks and benefits. We should not be surprised that phthalate metabolites have been detected in breast milk. As noted previously (LaKind et al., 2008), “It is axiomatic that exposure to an environmental chemical will lead to some level of that chemical in breastmilk.” Nonetheless, we need to be cautious about interpretation and use of data such as those in Table 2 in Latini et al., which are presented in a format that implies that we can be confident that the phthalate metabolite levels represent those in the milk at the time of collection. While the authors describe the methodological limitations of their study in the text, neither the limitations nor the significance of those limitations are provided in the Table; in addition, similar methodological limitations related to other studies summarized in Table 2 are not noted. It is important to consider that the studies cited in Table 2 of Latini et al. (with the exception of Högborg et al., 2008) did not use an esterase inhibitor during collection of milk samples, which is necessary to prevent the immediate breakdown of the parent phthalates to their monoesters (instead the inhibitor was added at the time of the laboratory analysis). Thus, the data given in Table 2 (with the exception stated) do not necessarily

represent levels of phthalates in the milk which infants drink, and appear to be greater than levels where the inhibitor was used as close as possible during the collection of the milk. For example, the levels reported by Högberg et al. are similar to those recently reported in Hines et al. (2009) in which esterase inhibitors were immediately added to collected milk samples; further, both studies used methods that took steps to prevent contamination by environmental sources. As stated by Calafat and Needham (2008), “even when the best analytical methods are employed, additional factors must be considered to guarantee that the biomonitoring data are valid.”

It is incumbent upon all of us who conduct biomonitoring research using human milk to be sensitive to the impact our data may have on expecting and breastfeeding mothers as well as health care providers in the position of giving advice on whether to breastfeed. This impact was recently documented by Geraghty et al. (2008), who reported that American women would immediately wean if told that phthalates were in their milk; 78% and 93% of mothers reported that they would either discontinue breastfeeding sooner than intended or pump and discard their milk. However, an abundance of studies has demonstrated that breastfed infants have lower risk of numerous adverse outcomes compared to formula-fed infants and 6 months of exclusive breastfeeding is recommended by the World Health Organization (WHO, 2007) and the American Academy of Pediatrics (2005). Except in cases of clinical treatment with certain pharmaceutical drugs or environmental poisonings, the presence of chemicals in breast milk has not resulted in recommendations to cease breastfeeding; in fact, several studies have found that breastfeeding can counter subtle adverse effects associated with in utero exposure to those same chemicals. Therefore, we have to strive to put human milk biomonitoring data in a constructive perspective that both informs and balances risks and benefits.

Out of context, data on environmental chemicals in breast milk may give the false impression that if the infant is not breastfed, chemical exposures will not occur.

In addition to ensuring that we carefully present our data on environmental chemicals in breast milk, we also need to be clear about whether a parent can expect similar or greater levels of that chemical in infant formula or the bottles used to deliver milk. In the United States and Canada, phthalates have been removed from infant bottle nipples (Shea et al., 2003), but many parents use nipples purchased before phthalates were removed. Moreover, we have almost no information on phthalates in nipples in other countries or on phthalates in flexible plastic inserts.

To make the best choice for feeding one's infant, all of the data on both breastmilk and formula as well as the delivery system need to be considered. Parents and health care providers cannot make informed decisions unless we as scientists clearly interpret and communicate our data.

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