Food consumption survey of Shanghai adults in 2012 and its associations with phthalate metabolites in urine

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Abstract

Background: Diet is considered to be a significant exposure pathway for phthalates. In this study, we assessed the associations between food consumption and urinary concentrations of phthalate metabolites among Shanghai adults.

Methods: A cross-sectional study involving 2,418 participants was conducted in the fall of 2012. Recent food consumption was assessed by a 24-hr dietary recall survey, and a food frequency questionnaire (FFQ) characterized long-term dietary patterns. Urinary metabolites of six phthalates were measured.

Results: Both the 24-hr recall survey and FFQ identified wheat, dairy, and fruits as being positively associated with the excretion of phthalate metabolites. The 24-hr recall data also showed positive associations with processed meats and alcohol. We evaluated the impact of reported consumption of multiple food categories simultaneously (wheat, fruits, meats, etc.) on metabolite excretion and found that, as

more food types were consumed, the number of metabolites excreted, as well as their concentrations, increased with high significance (p values < 0.0001). We also evaluated the two survey instruments together. When both surveys reported consumption of fruits and dairy, the numbers of metabolites and their concentrations were significantly higher compared to when both surveys reported non-consumption, (p values < 0.000001). Rice consumption was found to be negatively associated with phthalate excretion; frequent and high levels of rice consumption were found to be associated with lower excretion of metabolites.

Conclusion: Food consumption was associated with phthalate exposure in Shanghai adults. Both 24-hr recall and FFQ identified significant associations between consumption of food types and phthalate exposure.

Keywords: Phthalate metabolites in urine; 24-hour recall survey; food frequency questionnaire; Shanghai adults