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# Leaching of the plasticizer di(2-ethylhexyl)phthalate (DEHP) from plastic containers and the question of human exposure

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## Abstract

Di(2-ethylhexyl)phthalate (DEHP) is a widely used plasticizer to render poly(vinyl chloride) (PVC) soft and malleable. Plasticized PVC is used in hospital equipment, food wrapping, and numerous other commercial and industrial products. Unfortunately, plasticizers can migrate within the material and leach out of it over time, ending up in the environment and, frequently, the human body. DEHP has come under increased scrutiny as its breakdown products are believed to be endocrine disruptors and more toxic than DEHP itself. DEHP and its breakdown products have been identified as ubiquitous environmental contaminants, and daily human exposure is estimated to be in the microgram per kilogram level. The objective of this review is to summarize and comment on published sources of DEHP exposure and to give an overview of its environmental fate. Exposure through bottled water was examined specifically, as this concern is raised frequently, yet only little exposure to DEHP occurs through bottled water, and DEHP exposure is unlikely to stem

from the packaging material itself. Packaged food was also examined and showed higher levels of DEHP contamination compared to bottled water. Exposure to DEHP also occurs in hospital environments, where DEHP leaches directly into liquids that passed through PVC/DEHP tubing and equipment. The latter exposure is at considerably higher levels compared to food and bottled water, specifically putting patients with chronic illnesses at risk. Overall, levels of DEHP in food and bottled water were below current tolerable daily intake (TDI) values. However, our understanding of the risks of DEHP exposure is still evolving. Given the prevalence of DEHP in our atmosphere and environment, and the uncertainty revolving around it, the precautionary principle would suggest its phaseout and replacement. Increased efforts to develop viable replacement compounds, which necessarily includes rigorous leaching, toxicity, and impact assessment studies, are needed before alternative plasticizers can be adopted as viable replacements.

Keywords

DEHP Phthalate Plasticizer Leaching Human exposure Environmental contamination

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