DI (2-ETHYLHEXYL) PHTHALATE EXPOSURE DURING CATHETERIZATION

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Background and Aims: Diethylhexyl phthalate (DEHP) may produce potential toxicity in human bodies. Medical devices containing DEHP are widely used in patients undergoing catheterization, but data on catheterization exposures are limited. In this prospective study, we will investigate the difference of DEHP level before and after catheterization.

Methods: A total of 16 patients (M/F 12/4, mean age 15.7±10.4 years) with congenital heart disease who underwent catheterization were enrolled. Urine samples were collected on admission, pre-catheterization, post-catheterization, and discharge times for assessment of urinary DEHP. We measured mono-(2-ethylhexyl) phthalate (MEHP) and two oxidative DEHP metabolites, mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) and mono (2-ethyl-5-hydroxyhexyl) phthalate (MEHHP). Exposures to DEHP, such as plastic container, catheters, and intravenous tubing systems were recorded.

Results: Distribution of creatinine-adjusted phthalate metabolites is shown in Table 1. There were significant differences between admission and pre-catheterization times in terms of MEHP (p=0.01), MEHHP (p=0.005), and MEOHP (p=0.001). There were significant differences between pre-catheterization and post-catheterization times in terms of MEHP (p=0.004), MEHHP (p=0.003), and MEOHP (p=0.002). There were no significant differences between post-catheterization and discharge times in terms of MEHP, MEHHP, and MEOHP. There were significant differences between admission and discharge times in terms of MEHHP (p=0.01), and MEOHP (p=0.005) except MEHP. DEHP metabolites on four different times were not significantly associated with PVC-containing systems except MEHHP on discharge ($r=-0.564$, $p < 0.05$). After a multivariate logistic regression, MEHHP levels were associated with intravenous tubing systems (p=0.07).

Conclusions: Use of intravenous tubing systems in catheterization may result in higher exposure to DEHP as reflected by elevated urinary levels of MEHP.

References: Brock JW, Caudill SP, Silva MJ, Needham LL, Hilborn ED (2002). Phthalate monoesters levels in the urine of young children. Bull Environ Contam Toxicol 68: 309-314,.

Shea KM. American Academy of Pediatrics Committee on Environmental Health (2003). Pediatric exposure and potential toxicity of phthalate plasticizers. Pediatrics. 111:1467-74.

Takahashi Y, Shibata T, Sasaki Y, Fujii H, Bito Y, Suehiro S (2008). Di(2-ethylhexyl) phthalate exposure during cardiopulmonary bypass. Asian Cardiovascular & Thoracic Annals. 16:4-6.