PREDICTORS AND TEMPORAL VARIABILITY OF URINARY PARABEN CONCENTRATIONS IN MEN AND WOMEN BEFORE AND DURING PREGNANCY

Kristen Smith, *Harvard University School of Public Health, USA*
Antonia Calafat, *Centers for Disease Control and Prevention, USA*
Jennifer Ford, *Harvard University School of Public Health, USA*
Myra Keller, *Harvard University School of Public Health, USA*
Russ Hauser, *Harvard University School of Public Health and Massachusetts General Hospital, USA*

Background and Aims: Parabens are used as antimicrobial preservatives in personal care products, pharmaceuticals, and food products, and are considered endocrine disruptors. There is widespread paraben exposure among the US population. To our knowledge, no studies have investigated variability in urinary paraben concentrations among men and women, as well as during pregnancy. Our objective was to evaluate the temporal variability and predictors of paraben concentrations.
Methods: Using on-line solid phase extraction-high performance liquid chromatography-isotope dilution tandem mass spectrometry we measured urinary concentrations of methyl-(MP), propyl-(PP), and butyl-paraben (BP).
Results: Between 2005 to 2010, 2218 urine samples were collected from 575 patients from the Massachusetts General Hospital Fertility Center: 356 women (1724 samples) and 219 men (494 samples). Eighty-one women became pregnant during the follow-up period and provided a pre-pregnancy urine sample and one during each trimester. For all participants, median concentrations were 117µg/L (range: < 1-23200µg/L; detection frequency: 99.7%) for MP, 25.5µg/L (<0.2-2550µg/L; 96.5%) for PP, and 0.70µg/L (<0.2-595µg/L; 67.0%) for BP. Adjusting for specific gravity (SG), MP concentrations were 5.2 fold higher among women compared to men ($p<0.0001$), 3.2 fold higher among African Americans compared to Caucasians ($p<0.0001$), and 27% lower during pregnancy compared to the woman's pre-pregnancy samples ($p=0.001$). The correlation of SG-adjusted MP concentrations was stronger between trimesters 1 and 2 ($r=0.33$; $p=0.003$) and 2 and 3 ($r=0.42$; $p=0.0001$) compared to between 1 and 3 ($r=0.26$; $p=0.02$). The intraclass correlation coefficient (ICC) for SG-adjusted MP was 0.51 for men and 0.43 for women. Similar results were found for PP.
Conclusions: Urinary paraben concentrations were significantly higher among women, and among African Americans compared to Caucasians, while concentrations decreased in women while pregnant compared to their pre-pregnancy samples. Finally, ICCs were higher for men compared to women suggesting lower temporal variability among men than women.