by the scientific community as the best for its sensitivity and specificity. We are therefore working to optimize to a sensitive multi-residue method in LC-MS, that will provide, in a near future, an excellent tool of cumulative risk assessment for these chemicals but also putting light on which are the limits of this technique and therefore how to handle a proper assess cumulative environmental risk by EDC's mixture exposure.

Key messages

- Evaluation of cumulative risk of BPA and phthalates is important for public health.
- Phthalates and BPA metabolite evaluation is important for environmental exposure monitoring.

Cumulative risk assessment by environmental to EDC's mixture exposure, a still open problem

Margherita Ferrante

G Oliveri Conti, M Fiore, C Ledda, MG D'Agati, A Floridia, MR Gallea, S Di Mauro, M Ferrante

Department G.F. Ingrassia, Hygiene and Public Health, University of Catania, Catania, Italy

Contact: marfer@unict.it

Background

All people are exposed to endocrine disrupting chemicals (EDC's) as Bisphenol A (BPA) and phthalates every day. Phthalates and BPA are primarily excreted in the urine, therefore, only using the hydrolytic phthalate monoesters as the biomarkers of exposure in an epidemiological study could introduce exposure's misclassification because the other metabolites are not accounted for, hence, the most complete approach for their biomonitoring is a multi-residue method use for total metabolites assessment in urine.

Methods

We are optimizing a multi-residue method for BPA and total phthalates metabolites evaluation, both free and conjugates, in urine (Mono-benzyl phthalate; Mono-n-butyl phthalate; Mono-isononyl phthalate; Mono-isodecyl phthalate; Mono-methyl phthalate; Mono-n-octyl phthalate; Mono(2-ethyl-5-hydroxyhexyl)phthalate; Mono(2-ethyl-5-oxo-hexyl)phthalate; Mono(2-ethyl-5-carboxypropyl)phthalate; Mono[2-(carboxy-methyl)hexyl]phthalate). Optimization was carried out through a Varian LC-ESI-TQD with a Thermo Betabasic column.

Results

The initial data show that Mono (2-ethyl-5-oxo-hexyl) phthalate singularly infused turns into Mono-methyl phthalate thanks to the contribution of groups exposed by the column's stationary phase. This can pose a huge problem if not considered from the outset and therefore unmanaged in analytics evaluations, also commercially available standards, individually certified pure to 95-98%, in reality, bring with them other metabolites account thereby making difficult validate the method.

Conclusions

Our experience may be a first contribution to start to clarify the metabolomics issues probably still unclear why use of LC-MS technique coupled with a restricted number of metabolites can produce misclassification in biomonitoring evaluation, although this technique is elected with too much superficiality