Background

- Critically-ill patients treated in intensive care units (ICU) are potentially exposed to high levels of chemicals used as additives in plastic of intubating devices which are employed extensively in these patients1,2.
- Previous studies have shown that ICU patients had higher levels of phthalate esters (PEs), such as di(2-ethylhexyl) phthalate (DEHP), and bisphenol A (BPA) in serum and urine compared to healthy individuals1,3,4.
- ICU patients could however be exposed to other plastic additives, such as organophosphorous flame retardants (PFRs) and alternative plasticizers (APs), yet no information is currently available in this regard.

Objectives

- We hypothesized that 1) adult patients who are admitted to the ICU are also exposed to PFRs and APs. We assessed this exposure by measuring the urinary levels of PFR and AP metabolites and 2) if the levels can be linked to the ICU-admission, the intensity of the care and the type of plastic-containing medical devices.

Research design and methods

- Urine samples of adult ICU patients treated with a range of medical devices were analyzed for a suite of PFR metabolites and AP metabolites1,3,4.
- PFR and AP metabolites were also measured in patients necessitating continuous venous hemofiltration (CVVH) and/or extracorporeal membrane oxygenation (ECMO).
- BPA and DEHP metabolites were previously measured in the same population, data are taken from Huynh et al.

Conclusions

- This is the first report on PFR and AP metabolites in adult ICU patients.
- Patients with specialized treatments such as CVVH, ECMO or both had higher levels of some PFR and AP metabolites compared with the controls or with other ICU patients.
- Levels of PFR and AP metabolites were much lower that the levels of DEHP metabolites. This indicates that despite the continuously tightening regulations, DEHP are still present in medical devices.
- Because patient safety is a concern in the ICU, further research into the (possibly toxic and clinical) effects of chemicals released from medical devices should be urgently undertaken.