Oral

[O25-3] O25-3: Drug abuse

Chairs: Eric J.F. Franssen, The Netherlands / Ryuji Kato, Japan
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[O25-3-2] Evaluation of an Ion Trap LC-MS/MS insturment (Toxtyper) for drug of abuse screening in oral fluid

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Background

Drug of abuse (DOA) screening in oral fluid (OF) is increasingly used for monitoring patients undergoing opioid replacement therapy. OF unlike urine has the advantage that sampling does not compromize privacy and adulteration is more difficult. Screening is commonly performed by immunoassays (IA). Confirmation is predominately performed using GC-MS that requires laborious sample preparation. Therefore, an easy to operate ion trap masspectrometer (IT-MS) has been evaluated for its application to OF.

Methods

OF was collected (Greiner Bio One devices) from volunteers and DOA patients. Samples were subjected to protein precipitation (acetonitrile) followed by HybridSPE®-phospholipid extraction. Chromatogrpahic separation was achieved by UHPLC (Thermo Fisher) and MS2/MS3 spectra were recorded by IT-MS (Bruker Daltronik) and analyzed using a DOA library provided by the manufacturer. The low limit of detection (LOD), linearity, precision (CV%) as well as accuracy (d%) (n=6 within (w) and between (b) series), and specificity (interferences, matrix effects) were investigated for methadone, buprenorphine (bup), pregabalin, fentanyl, MDMA, cocaine, and nordiazepam using drug free OF. In addition, concordance between IT-MS results and results generated with GC-MS/MS, LC-MS/MS, or IA (bup) was investigated. Predefined acceptance criteria for CV% and d% were 25%, for concordance 80%, and r>0.98 for linearity.

Results

No interferences or matrix effects were observed. Performance data are summarized in the table.

Zoom image

Concordance was as follows: IT-MS vs. GC-MS: 95% amphetamines, 96% opiates, 83% cocaine, methadon 97%, IT-MS vs. LC-MS/MS: benzodiazepines 91%, pregabalin 92%, fentanyl 92%; IA: bup 88%.

Conclusions

The toxtyper IT-MS is easy to use and can be applied for screening of DOA and qualitative confirmation analysis in OF in a clinical toxicology service. It met our predefined acceptance criteria for the selected substances except for buprenorphine. Although intended for qualitative analysis, performance data suggest that the methods investigated may be also applicable for semi-quantitative longitudinal follow up.