

VALIDATED QUANTITATIVE SIMULTANEOUS DETERMINATION OF COCAINE, OPIATES AND AMPHETAMINES IN SERUM BY UHPLC-MS/MS

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Simultaneous determination of cocaine, opiates and amphetamines in serum by ultra-high performance liquid chromatography coupled to tandem mass spectrometry (UHPLC-MS/MS) allowed to replace favourably gas chromatography coupled to mass spectrometry (GC-MS) used until now in our laboratory. It had to answer to accreditation demand according to Belgian Accreditation (Belac). Twenty-one deuterated internal standards were added to 500µL of serum. Sample pre-treatment consisted of solid-phase extraction using Oasis MCX cartridges 1mL, 30mg (Waters, Zellik, Belgium). Chromatographic separation was done on an Acquity HSS T3 column (2.1 x 100mm, 1.8µm, Waters). Mobile phase consisted of pH 3 ammonium formate buffer and of methanol adjusted to pH 3 with formic acid and was delivered according to a gradient elution mode. Compounds were then analysed by tandem mass spectrometry operated in the multiple reaction monitoring (MRM) mode [1,2]. The method was validated using total error approach.

Twenty-seven drugs were separated in 19 minutes. The linearity of the method was acceptable in the validated range of concentrations. The biases were lower than 15% for all compounds and the relative standard deviations for repeatability and intermediate precision did not exceed 15%. Lower and upper β -expectation tolerance intervals did not exceed the acceptance limits of 20% for concentrations upper than 20µg/L and 50% for concentrations lower than 20µg/L. The limits of quantitation were lower than 7µg/L for all compounds.

References

- [1] Lacroix C. et coll., Quantification des opiacés, cocaïniques et amphétaminiques par chromatographie liquide haute performance / spectrométrie de masse en tandem après séparation en ligne de l'échantillon, *Ann Toxicol Anal.*, 2008 ; 20(1) : 25-38
- [2] Rook E. et coll., The quantitative analysis of heroin, methadone and their metabolites and the simultaneous detection of cocaine, acetylcodeine and their metabolites in human plasma by high-performance liquid chromatography coupled with tandem mass spectrometry, *J. Chromatogr. B*, 2005 ; 824 : 213-221