Tableau 1 IS prédit et IS optimal pour chaque analyte.

Analyte	IS prédit	IS optimal	Analyte	IS prédit	IS optimal	Analyte	IS prédit	IS optimal
^{27}Al	^{9}Be	^{9}Be	^{118}Sn	^{115}In	^{128}Te	^{82}Se	^{89}Y	^{69}Ga
^{121}Sb	^{115}In	^{128}Te	^{127}I	^{128}Te	^{128}Te	^{88}Sr	^{89}Y	^{69}Ga
^{75}As	^{74}Ge	^{74}Ge	^{7}Li	^{9}Be	^{9}Be	^{205}Tl	^{193}Ir	^{128}Te
^{16}O^{75}As	^{89}Y	^{193}Ir	^{55}Mn	^{69}Ga	^{69}Ga	^{47}Ti	^{69}Ga	^{9}Be
^{138}Ba	^{140}Ce	^{133}Cs	^{202}Hg	^{193}Ir	^{193}Ir	^{184}W	^{187}Re	^{187}Re
^{209}Bi	^{193}Ir	^{133}Cs	^{98}Mo	^{103}Rh	^{89}Y	^{238}U	^{232}Th	^{140}Ce
^{11}B	^{9}Be	^{9}Be	^{197}Au	^{193}Ir	^{193}Ir	^{66}Zn	^{69}Ga	^{69}Ga
^{79}Br	^{74}Ge	^{74}Ge	^{105}Pd	^{103}Rh	^{103}Rh	^{90}Zr	^{89}Y	^{89}Y
^{111}Cd	^{115}In	^{115}In	^{195}Pt	^{193}Ir	^{193}Ir			
^{65}Cu	^{69}Ga	^{103}Rh	^{208}Pb	^{193}Ir	^{128}Te			

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P32

Fast determination of mazindol in hair sample using UPLC-MS/MS: An isotopic identification approach

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Objectif Accidents on Brazilian highways kill more than 40 thousand people every year, not considering those who are injured and/or disabled by them. Since the implementation of federal law 13103/2015 to control the use of drugs by truck drivers, where the control is done by analysis of the substance in hair by a retroactive minimum period of 90 days, more than 100.000 people have been detected with a presence of one or more prohibited drugs in their hair samples. The Mazindol (cutoff of 0.5 ng/mg) is on of fourteen prohibited substances in the list and the second most stimulant in use. Mazindol is a sympathomimetic agonist causing central nervous system stimulation, acting together at peripheral alpha and beta-receptors. However, a serious side effect is the alteration of perception, which can be associated with accidents involving roads. In Brazil, the National Sanitary Agency (ANVISA) banned the production and marketing of this substance throughout the national territory in 2011, as the drug did not present proven effectiveness in its main indication: the treatment of obesity. After six years, in June of 2017 the federal law by the Brazilian congress (13.454/2017) authorizes once again the production and marketing of mazindol, amphetamine, sibutramine and femproporex. Nowadays, the majority of Brazilian laboratories use the mass spectrometry technique as a screening and confirmatory test on their routine analyses. The present study presents the use of isotopic separation by UPLC-MS/MS to confirm the presence of mazindol in a hair sample.

Methods Hair samples collected from real cases were obtained from authorized patients for the study. The method was validated and accredited to ISO/IEC 17025 standards for the specificity, sensitivity, linearity, accuracy, precision, recovery, and stability using 10 mg of hair. LOD and LOQ were 0.25 ng/mg. The chromatography run time was 2.2 min. The hair samples were washed and then extracted with organic solvent in the presence of deuterated analogues followed by an incubation under 60 °C for 8 h Reverse phase separation was performed with the Acquity BEH C18 chromatographic column (50 × 2.1 mm × 1.7 μm).

Results Mazindol has chlorine atom in its chemical structure; it's possible to perform an isotopic separation and identification as the approach to confirm mazindol in hair. Considering the chlorine isotope has ^{35}Cl and ^{37}Cl in 1/3 proportion, the mass spectrometry was set to determine 285.1 and 287.1 m/z with transition 44 m/z. Instead of evaluating one parent ion and one product ion, we evaluated two parent ions (isotopic) and the same product ion. Due the mazindol presents interference in the most intense fragment in a fast-chromatographic analysis, the fragment 285.2 > 44 m/z has no interference in real samples. For mazindol quantitation, the transition 285.1 > 44 m/z can be used and for confirmation criteria an isotope transition of mazindol 287.1 > 44 m/z can be used, thus increasing the reliability of the generated data without interference. The method was applied in a two real sample and mazindol was determined and confirmed by the present method, 1.18 ng/mg and 2.18 ng/mg. The isotope separation and identification by tandem triple quads is a useful way to confirm chemical structure when there is no formation or there is a no abundant formation of ion for quality analysis and confirmation the presence of substance using a fat chromatographic separation.

Disclosure of interest D.-A. Pereira works for Waters Corporation. The other authors have not supplied their declaration of competing interest.

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Place des bandelettes de test d'adultération et du dosage de la créatinine urinaire comme marqueur de dilution des urines

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Introduction La concentration urinaire en créatinine est utilisée depuis longtemps pour détecter les échantillons urinaires « adultérés » par dilution ex vivo. Depuis plusieurs années, ont été mis sur le marché différentes bandelettes réactives destinées à identifier des situations d'adultération plus large que la simple dilution des urines. Les fournisseurs proposent différentes associations de test dont le dépistage qualitatif et semi-quantitatif de la créatinine dans les urines.

Objectif Comparer sur un échantillon représentatif d'urine, les performances de la détermination de la concentration urinaire de créatinine par rapport aux bandelettes réactives destinées à identifier des situations d'adultération plus larges.

Méthodes Un total de 45 échantillons urinaires ont été analysés avec les 2 méthodes disponibles : la détermination des concentrations urinaires en créatinine était réalisée par méthode enzymatique sur un automate de biologie médicale, avec une gamme mesure de 53 à 35 000 umol/L. La seconde méthode permettait la recherche et le dépistage combinée et simultanée de la créatinine, du glutaraldéhyde, des nitrites, du pH, de la densité urinaire, de la présence de réactifs oxydant comme le péroxyde d'hydrogène ou le chlorochromate de pyridium. Pour les bandelettes utilisées le seuil de dilution était franchi pour une concentration de créatinine à 10 mg/dL (soit 884 umol/L) : seuil indiqué sur la notice du fabriquant. Pour la méthode utilisée au laboratoire sur automate : le seuil utilisé est celui indiqué par le fabriquant, soit 3536 umol/L pour les hommes et 2564 umol/L pour les femmes.

Résultats Les résultats sont présentés dans le Tableau 1.

Conclusion Avec le seuil de détection utilisé sur les bandelettes : les bandelettes ne permettent pas d'identifier les urines suspectes de dilution. Seule une « urine » a été identifiée comme diluée sur la base de la creatinine urinaire (406 umol/L sur automate, < 100 mg/L sur bandelette). Pour 3 des 9 urines diluées, une densité

urinaire anormalement basse a été détectée (densité < 1,003), pour les 6 autres la densité était considérée comme normale.

Discussion L'utilisation d'un seuil à 100 mg/L (soit 884 umol/L) sur ces bandelettes ne permet pas d'identifier les échantillons urinaires suspects de dilution. Ce seuil est probablement trop bas, par rapport à certaines recommandations dont les plus rigoureuses rendent suspicieuse des urines présentant une créatin-inurie < 8000 umol/L [1].

Tableau 1

Bandelettes	Automate	
	Urines diluées	Urines non diluées
Urines diluées	1	0
Urines non diluées	8	36

Déclaration de liens d'intérêts Les auteurs déclarent ne pas avoir de liens d'intérêts.

Référence

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P34

Do cosmetic treatments increase the incorporation of amphetamines into hair?

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Objective According to several studies, the concentration of drugs in hair may decrease by bleaching or dyeing; however, at the same time, treated hair could incorporate greater quantity of drugs from sweat or sebum than intact hair. The aim of this study is to assess the incorporation of amphetamine (AP), methamphetamine (MA) and 3,4-methylenedioxy-methamphetamine (MDMA) from sweat or sebum to virgin, dyed, and bleached hair.

Methods Drug-free head hair samples (from 20 volunteers) were divided into four locks, one of them was left untreated, another was subjected to dyeing treatment, and the last two were subjected to different degree of bleaching. Virgin, dyed, mildly as well as severely bleached locks of hair were exposed to artificial sweat or sebum containing AP, MA, and MDMA (500 ng/g), at 37 °C for a time period of 8 and 24 h, respectively. After the exposure, all the hair samples were tested by GC/MS in SIM mode, applying an already published method. Drug concentrations in hair ranged 0.41 to 2.20 ng/mg from artificial sweat, while only reached 0.27 ng/mg from artificial sebum. The differences of each drug concentration (AP, MA, MDMA) between different kind of hair were statistically compared: virgin hair vs. dyed hair, virgin hair *vs* mildly bleached hair, virgin hair vs. severely bleached hair. The differences between different drugs concentration within each kind of hair (virgin, dyed, mildly and severely bleached) were, as well, statistically compared: AP vs. MA, AP vs. MDMA, MA vs. MDMA. In all cases, differences were calculated between locks of hair from the same volunteer. The paired samples Student's t-test was applied in cases where the concentration differences followed the normal law. In these cases the extent of the difference was calculated with a confidence interval of 95%. The paired samples Wilcoxon's *t*-test was applied in cases where the concentration differences did not follow the normal law.

Results Regarding the incorporation of AP, MA and MDMA from artificial sweat in vitro, the analysis provides evidence that the mean concentration for each drug in dyed or bleached hair is higher than the mean concentration in virgin hair, and that the differences between means are likely to be between 0.15 and 0.57 ng/mg, depending on the drug and the compared pairs. The incorporation of different drugs in the same kind of hair shows little differences in virgin and dyed hair, but the mean concentration of MDMA in bleached hair is higher than the mean concentration of AP; the differences between means are likely to be between 0.08 and 0.16 ng/mg. Regarding the incorporation of AP, MA and MDMA from artificial sebum in vitro, the differences between mean concentrations are lower for every compared pair, in relation to the incorporation from sweat. AP is not incorporated into hair from sweat or sebum to a greater extent than MDMA.

Conclusions Higher positivity rates for AP have been found in dyed or bleached hair in relation to virgin hair, detecting both significant [1] and non-significant [2] differences in the target populations. Based on these facts and the quantitative results of in vitro incorporation of amphetamine derivatives in hair, when interpreting the results from cosmetically treated hair, consideration should be given not only to the possibility that the treatment will lead to a decrease in drug concentration, but also to an increase. This consideration is particularly relevant if the detected levels are close to the cut-off.

Disclosure of interest The authors declare that they have no competing interest.

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P35

Les suicides et les tentatives de suicide par intoxication au Maroc : épidémiologie, indicateurs de santé et facteurs de risque

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Objectif Selon les données de l'Organisation mondiale de la santé (OMS), un million de personnes se suicident chaque année dans le monde et ce nombre pourrait s'élever à 1,5 million en 2020. L'objectif de la présente étude est de dresser le profil épidémiologique des suicides et des tentatives de suicide par intoxication au Maroc ainsi que de déterminer les facteurs de risque engageant le pronostic vital des intoxiqués.

Méthodes Il s'agit d'une étude rétrospective des cas d'intoxications suicidaires, déclarés au centre antipoison et de pharmacovigilance du Maroc, durant la période de 1980 à 2013.

Résultats Durant cette période, 24 335 cas d'intoxications suicidaires ont été enregistrés au Maroc. L'âge moyen des victimes était de 24,39 ± 0,08 ans, avec un sexe ratio de 2,41 en faveur des femmes. L'incidence totale sur les 34 années de l'étude est de 2,4 pour 100 000 habitants, la mortalité est de 0,67 pour un million d'habitants et la létalité est de 0,08 %. Ces indicateurs étaient très variables aussi bien dans le temps que dans l'espace. Ils varient également en fonction des diverses caractéristiques étudiées (caractéristiques liées au toxique, au patient et au lieu de l'intoxication). L'évolution annuelle de ces indicateurs montre une