ASSESSING THE RELIABILITY OF A URINE IMMUNOASSAY FOR COCAINE DETECTION IN PLASMA: IMPLICATIONS FOR EMERGENCY TOXICOLOGICAL PROTOCOLS

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BACKGROUND: Qualitative analysis of cocaine in urine enables detection of recent use but cannot diagnose current intoxication. Otherwise, plasma allows correlation between substance levels and observed clinical effects, though immunoassays for plasma are commercially limited. This work aims to evaluate the reliability of a urine immunoassay for cocaine detection in plasma samples from intoxicated patients. **MATERIALS AND METHODS**: Plasma samples from suspected intoxications attended by the Toxicological Information Center of Rio Grande do Sul (CIT-RS) were screened using the Assure Tech Multi Drug 7 Rapid Test, a lateral flow immunochromatography test. Various cutoff values (5, 20, 40, 80, 125 and 200 ng/mL) were assessed for sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and efficiency. The screening results were compared with data from LC-MS/MS analysis. Cocaine (COC), benzoylecgonine (BZE), and ecgonine methyl ester (EME) were quantified by LC-MS/MS, with a lower limit of quantification of 5 ng/mL The research received approval from the Ethical Committee for Human Studies of the Federal University of Health Sciences of Porto Alegre (CAAE 31992920.3.0000.5345). **RESULTS AND CONCLUSION**: The study included 412 samples (52.4% male; mean age 18 ± 16.1 years, range 0–73). Suicide attempts were the most common exposure. The optimal cutoff for BZE was 40 ng/mL, achieving 96.3% sensitivity, 97.9% specificity, 76.5% PPV, 99.7% NPV and 97.8% efficiency. COC as the target analyte yielded unsatisfactory results (0% sensitivity at 20 ng/mL). For EME, sensitivity and specificity exceeded 90% across all cutoffs, but PPV remained below 40%. Satisfactory reliability was achieved using the rapid test for plasma when BZE is the target analyte, as expected given BZE's higher prevalence in plasma and urine. The test was unsuitable for COC detection due to the low number of COC-positive samples. EME had satisfactory sensitivity and specificity, but low PPV suggests that its reliability depends on BZE's presence in the samples.

Keywords: cocaine, plasma, immunoassay, immunochromatography.