I34 A Comparison of Results From Clinical and Forensic Urine Screening for Opiates in Psychiatric Patients

Daylien Casas, BS, 2920 SW 12 St, Miami, FL; Lisa J. Reidy, PhD, Univ of Miami Forensic Tox Lab, 1600 NW 10th Ave, RSMB R5, Rm 7020A, Miami, FL 33136; Patiricia Junquera, MD, Univ of Miami, Miller School of Medicine, Dept of Psychiatry and Behavioral Sciences U, 3101 JMH-Mental Health Bldg, Miami, FL; and Bernard W. Steele, MD, Jackson Memorial Hospital, Holtz Center Rm 2026, 1611 NW 12th Ave, Miami, FL 33136*

After attending this presentation, attendees will learn how clinical toxicology testing is not as accurate and as specific as they should be for patients with a history of drug abuse and psychiatric illness. Attendees will also learn that many patients who are currently using opiates would return a hospital drug screen as "negative" for opiates when this clearly is not the case. The screening methodologies currently employed in clinical laboratories are not sensitive enough to provide comprehensive toxicology results.

This presentation will impact the forensic science community by improving appropriate treatments and diagnoses for psychiatric patients.

Introduction: Patients with mental illness, such as bipolar or schizophrenia, are more likely to have substance abuse problems than the general population. If both are identified, then the individual may receive continuous treatment for each affliction. One problem associated with drug abuse lies in the detection of the drugs in a clinical setting. Patients with mental illness and drug use present a difficult challenge for physicians to determine if the causation factor for the mental illness is drug abuse or if the mental illness led them to drug abuse. If drug use is suspected, a urine sample is collected and sent to the hospital laboratory for drug screening. The drugs that are routinely screened for vary between hospital and/or institution. The screening is typically five different drug classes that include: cannabis, amphetamine(s), cocaine, opiate(s), and benzodiazepine(s). In most hospital laboratories, no confirmation for drug use is performed due to the conception that this is expensive and time-consuming. The reliability and accuracy of the urine toxicology results is a vital tool for the correct diagnosis of these patients.

Objective: This study was conducted to assess the accuracy of the clinical toxicology testing for patients with a history of drug abuse and psychiatric illness. According to the data from the National Institute on Drug Abuse, the number of opiates prescribed has dramatically increased in the last 20 years, with 131 million prescriptions written/dispensed in 2000 that had increased to 210 million in 2010. Due to this increase in use and the lack of cross reactivity with some opiates in hospital drug screening, a study was conducted comparing clinical toxicology results with typical forensic toxicology screening that combines Enzyme Linked Immunosorbant Assay (ELISA) and Gas Chromatography–Mass Spectrometry (GC-MS) to screen and confirm a wide variety of drugs.

Materials and Methods: In this IRB-approved study, 338 urine samples were collected from the hospital laboratory from patients admitted into detox or mental health institutions. Patients were comprised of males and females with ages ranging between 18 and 65 years old. The results from the hospital urine drug screening with EMIT (Enzyme Multiplied Immunoassay Technique) was obtained. The forensic toxicology testing protocol utilized a DS2 (Dynex Technologies) fully automated ELISA instrument using opiate and oxycodone ELISA kits (Neogen KY, USA). The comprehensive GC-MS screening utilized a basic LLE (Liquid-Liquid Extraction) then fast GC-MS (Agilent Technologies) analysis. These tests are comparable in pricing and in speed that is vital for routine toxicology testing in a hospital environment.

Results and Conclusions: The results of both laboratories urine drug screening are presented in Table 1. With the EMIT screening technologies; they tend to have a poor cross-reactivity to oxycodone and oxymorphone which can explain some of the differences seen. Clearly, the results demonstrate that the current screening methodologies typically employed in clinical laboratories are not sensitive enough to provide comprehensive toxicology results. The results show that many patients that are currently using opiates would return a hospital drug screen as "negative" for opiates when this is evidently not the case. The screening used at the hospital at baseline for most of the patients were inaccurate and unspecific and in this instances missed over half of the patients using opiates which is important information when trying to determine the treatment for those patients. The GC-MS data identified a wide variety of opiates in use in this population use ranging from 6-monoacetylmorphine, hydrocodone, hydromorphone, oxycodone and oxymorphone to name a few.

Table 1: The drug screening results of a clinical laboratory vs. the drug screening results a toxicology laboratory. N= 338

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Drug Group	Toxicology Laboratory		Clinical Laboratory	
	Number of Positive Patients	% Positive	Number of Positive Patients	% positive
Opiates (class)	30	9	22	6.5
Oxycodone (class)	20	6	N/A	N/A

Inaccurate, Opiates, Screening

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