The Triage is a competitive binding immunoassay, whereas the Syva and Genix assays are one-step immunochromatographic assays for rapid detection of opiates in urine with a cutoff concentration of 300 mg/L. Information about rifampin cross-reactivity with these immunoassays was not available from the manufacturers. The only reported interference for rifampin is with the opiates kinetic interaction of microparticles in solution (KIMS) method for Roche reagents on Cobas Integra.

The antibiotic rifampin is usually part of the treatment of tuberculosis, especially in patients with concomitant human immunodeficiency virus infection. Generally, drug abuse in some of these patients necessitates screening for opiates (4). In addition, in cases of mental confusion associated with tuberculous meningitis or rifampin toxicity, it is not uncommon for a drugs of abuse screen to be ordered. Depending on the specificity of the method, rifampin interference could be the cause of false-positive opiate screening results. Therefore, the presence of rifampin treatment mandates confirmatory testing for opiates because it can interfere with the predictive value of certain rapid screening assays (5).

We recommend that each laboratory evaluates rifampin interference with the opiates immunoassay in use. In addition, each laboratory should maintain an updated listing of reported interference problems with immunoassays, as part of a quality assurance program, and disseminate this information to the medical community (6). However, this rapid screen serves the need for emergency drug testing, but it must always be complemented by confirmation.

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Effect of Piperacillin-Tazobactam on Clinical Capillary Zone Electrophoresis of Serum Proteins

To the Editor:
Over the last 5 years, capillary zone electrophoresis (CZE) has emerged as an automated technique for the separation of serum proteins in clinical laboratories (1–5). In conventional methods, quantification of the protein fractions is based on dye binding, whereas CZE uses ultraviolet detection at 214 nm for direct protein quantification via the peptide bonds. Any substance or drug that is present in serum and that absorbs at 214 nm potentially can interfere with CZE analysis. It has been reported that radio-contrast media, which absorb at 214 nm, interfere with CZE and can simulate a monoclonal component (6–8). In the present report, we describe that the antibiotic piperacillin-tazobactam (Tazocin®; Wyeth Lederle) produces a small peak at the anodal site of the β-globulin fraction.

In Fig. 1, panels A and C show the β and γ fractions of CZE electropherograms (Beckman Paragon CZE 2000, software version 2.21) of two samples obtained from patients who received piperacillin-tazobactam (4 g of piperacillin/500 mg of tazobactam three times per day). In the sample shown in panel C, there was a small monoclonal protein in the γ region. The antibiotic was given intravenously over a 30-min period. The samples were obtained 10 min (Fig. 1A) and 30 min (Fig. 1C) after administration of the antibiotic. In each case, a small but distinct peak was observed at the anodal site of the transferrin peak in the β-globulin fraction. Such a peak is absent in a normal CZE electropherogram and was not seen in the CZE electropherogram of a specimen from the same patient as in Fig. 1A collected 2 days after piperacillin-tazobactam administration (Fig. 1B). After this time period, the antibiotic had been cleared from the blood stream. The elimination half-life of piperacillin-tazobactam is 0.7–1.2 h in patients with normal kidney function. Protein binding for piperacillin is 16% at serum concentrations of 200–300 mg/L; for tazobactam, protein binding is 20–23%. Addition of piperacillin-tazobactam to a normal serum led to the appearance in the CZE electropherogram of an abnormal peak in the same location as the extra peak observed in the electropherogram from patients receiving the antibiotic (Fig. 1D). Parenteral administration of vancomycin (Vancocin®, 1 g twice per day; Eli Lilly) or ceftazidim (Glazidim®, 1 g three times per day; Glaxo Wellcome) did not lead to the appearance of an abnormal peak on CZE (data not shown).

Collectively, intravenously administered piperacillin-tazobactam produces a small peak in the β region in CZE. Such peaks might simulate a small monoclonal protein.
to confirm either LSD or its metabolite 2-oxo-3-hydroxy LSD by liquid chromatography–mass spectrometry (LC-MS).

The case involved a 31-year-old male with severe end-stage cardiomyopathy secondary to rheumatic heart disease and crack cocaine abuse. He called emergency medical services from home with complaints of shortness of breath. He was subsequently diagnosed with cardiogenic shock secondary to sepsis and cardiomyopathy. He was intubated and admitted to the coronary care unit for hemodynamic support including intraaortic balloon pump. His initial urine drug screen on admission was negative.

The patient was treated for sepsis and gradually weaned from ventilatory and pressor support. The patient's condition steadily improved. While in the unit, the patient had frequent visits from his girlfriend, whose behavior was noted to be inappropriate and included lying on top of the patient. After one such visit, the patient's mentation deteriorated, and he became incoherent and questionably began hallucinating. A second urine drug screen was performed and was presumptively positive for LSD by immunoassay (CE-DIA, Microgenics Corporation; Emit II, SYVA Company). LC screening of the urine (Remedi HS, Bio-Rad Laboratories) showed only ranitidine and lidocaine. A third urine drug screen obtained 3.5 h later was also presumptively positive for LSD. These findings raised the strong suspicion that the patient's girlfriend had given him LSD. All three urine specimens (one negative and two positive specimens for LSD) were analyzed next by LC-MS for confirmatory analyses (2). All results were negative for both LSD and its major metabolite 2-oxo-3-hydroxy LSD.

To further investigate the potential cause of the false-positive LSD immunoassay screens, both immunoassay package inserts were reviewed to determine what drugs may lead to substantial cross-reactivity, but none was initially identified as causal. The concentration of lidocaine in the patient's urine, 0.8 μg/L, was too low

Fig. 1. Effect of piperacillin-tazobactam on serum CZE.

CZE electropherograms of the β and γ regions of two samples collected 10 min (A) and 30 min (C) after administration of intravenous piperacillin-tazobactam (4 g of piperacillin/500 mg of tazobactam three times per day). The electropherograms shown in A and C are from two different patients. (B), CZE electropherogram of a specimen collected 2 days after piperacillin-tazobactam administration in the same patient as in A. (D), CZE electropherogram of a normal serum sample supplemented with 0.8 g/L piperacillin–0.1 g/L tazobactam. The arrows in A, C, and D indicate the abnormal peak.

References

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False-Positive Lysergic Acid Diethylamide Immunoassay Screen Associated with Fentanyl Medication

To the Editor:

The prevalence of lysergic acid diethylamide (LSD) use has steadily increased over the past two decades. The 2000 National Household Survey on Drug Abuse (1) estimated that of the population 12 years and older, 3.5% have tried LSD. With the increase in LSD and other illicit drug use, urine drug screening in occupational and clinical settings has likewise increased. In the toxicology laboratory of Hennepin County Medical Center, LSD is one of eight drugs screened in the routine urine immunoassay drugs-of-abuse panel. In this report, we describe several cases involving false-positive urine screens for LSD by either the CEDIA and/or SYVA Emit II immunoassays. In one case, two urine samples that were immunoassay positive for LSD failed