Q/ How accurate are point-of-care urine drug screens in patients taking chronic opioid therapy?

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EVIDENCE-BASED ANSWER

A/ IN ADULTS TREATED with opioids for chronic pain, point-of-care (POC) urine drug screens (immunoassays) for detecting opioids show a false-negative rate of 1.9%, a sensitivity of 92%, and a specificity of 93% compared with the gold-standard liquid chromatography tandem mass spectrometry (LC-MS). Oxycodone has the highest rate of false-negative results at 25%; methadone has the lowest rate at 4% to 6% (strength of recommendation [SOR]: **A**, 2 blinded diagnostic accuracy studies with similar results).

Evidence summary

A 2011 blinded diagnostic accuracy study of 1000 adult chronic pain patients in an interventional pain management program in the United States compared POC immunoassay urine drug testing with LC-MS.[1] The immunoassay index test can be performed in the office with rapid results. The LC-MS reference test requires that the urine sample be sent to a lab.

Study participants were 37% male and 63% female, average age 51 years. Of the 1000 patients, 920 were prescribed opioids. Morphine, hydrocodone, codeine, and hydromorphone (morphine group) were tested with cutoff values of 300 ng/mL for POC testing and 50 ng/mL for LC-MS. Cutoffs for methadone were 300 ng/mL for POC and 100 ng/mL for LC-MS. For oxycodone, they were 100 ng/mL for POC and 50 ng/mL for LC-MS.

Methadone had the highest sensitivity and specificity at 96% and 99%, with a false-negative rate of 3.9% and a false-positive rate of 1.2%. It also had the highest agreement between the 2 testing methods at 99%. The morphine group had a sensitivity of 92%, specificity of 93%, false-negative rate of 7.8%, false-positive rate of 6.9%, and 93% test agreement. Oxycodone showed the lowest sensitivity at 75%; it had a specificity of 92%, a false-negative rate of 25%, a false-positive rate of 7.7%, and 90% test agreement.

More false negatives than with LC-MS

A 2010 blinded diagnostic accuracy study of 4200 adults treated with opioids for chronic pain compared immunoassay urine testing with LC-MS for opioids, benzodiazepines, marijuana, cocaine, and methamphetamine between October and November 2008.[2] Urine samples were tested using both methods simultaneously on split specimens. Cutoff values for methadone, codeine, hydrocodone, hydromorphone, and morphine were 50 ng/mL on LC-MS. Immunoassay relative activity—the difference between the immunoassay and the LC-MS cutoffs—was 300 for methadone, 180 for codeine, 1700 for hydrocodone, 4000 for hydromorphone, and 300 for morphine.

Of the 3414 samples submitted for opiate testing, 2191 tested positive using immunoassay and 2233 tested positive using LC-MS for a total of 42 false-negative results with immunoassay. The positive rate (percentage of samples testing positive by LC-MS) was 65%, and the false-negative rate was 1.9%. Methadone testing produced 17 false-negative results; the positive rate was 10%, and the false-negative rate was 6.1%. The immunoassay false-positive results occurred in patients taking hydromorphone and hydrocodone.

The study was limited by lack of demographic information on the participants. JFP

References

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2. Pesce A, Rosenthal M, West R, et al. An evaluation of the diagnostic accuracy of liquid chromatography-tandem mass spectrometry versus immunoassay drug testing in pain patients. *Pain Physician*. 2010;13:273–281.