New wave of complex street drugs puzzles emergency doctors

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At a time when drug overdoses are becoming more prevalent and lethal, a new report provides a snapshot of regional illicit drug use and, for the first time, highlights the complexity of detecting and treating patients at

hospital emergency departments for a severe drug-related event.

The objective of the study, which began in 2016, was to identify illicit drugs that caused overdoses in patients at two hospital emergency departments in Maryland.

Emergency physicians were battling a spike in accidental drug overdoses and related deaths, thought to be linked to a group of designer drugs called synthetic cannabinoids that mimic the chemicals in marijuana, known on the street as Spice or K2. One doctor described "atypical overdoses," patients with breathing difficulties and constricted pupils who responded well to the opioid overdose-reversing drug naloxone, and then required sedation for acute agitation, violence and hyperactivity, all unrelated to opiate withdrawal.

The physicians believed that knowing which drugs were in use might help tailor patient treatment.

At the same time, researchers at the Center for Substance Abuse Research (CESAR) at the University of Maryland, College Park, with the support of the U.S. Office of National Drug Control Policy, were generating a number of reports detailing illicit drug use patterns in criminal justice settings. The researchers used sophisticated analyses of de-identified urine samples to detect drugs.

The substance abuse researchers decided to expand their urine testing technique for the first time to hospital settings, and link the test results to de-identified patient medical records. Hospitals typically use urine tests to detect just a handful of drugs and medical conditions.

The CESAR researchers enlisted the participation of emergency physicians at the University of Maryland Medical Center Midtown Campus (UMMC Midtown) in Baltimore, and the University of

Maryland Prince George's Hospital Center in Cheverly, a suburb of Washington, DC.

Test Results

The urine specimens, 106 from Prince George's and 69 from UMMC Midtown, were sent to the Armed Forces Medical Examiner System laboratory in Delaware where they were tested for 26 synthetic cannabinoids, 59 designer drugs and 84 other illicit and prescription drugs.

With the results, the researchers realized the substances used by these emergency department overdose patients were much more complex than anticipated.

"We were thoroughly amazed that in a study where we thought everyone was having a synthetic cannabinoid-related problem, only one specimen tested positive for synthetic cannabinoids," says principal investigator Eric Wish, Ph.D., Director of CESAR at the University of Maryland, College Park, College of Behavioral & Social Sciences.

It was clear the street drugs had been tweaked into new combinations that weren't being detected. Still, about a year later, after the lab expanded their tests for synthetic cannabinoids from 26 to 46 metabolites, only a quarter of the samples tested positive for synthetic cannabinoids, much smaller than anticipated.

Also clear was the huge mismatch between the drugs patients said they had taken and physician suspicions of drug use, compared to the actual drugs detected. "We had cases where the doctors thought so, the patient thought so, but urinalysis showed no use of synthetic cannabinoids," says Bradford Schwartz, MD, an emergency physician at the University of Maryland Prince George's Hospital Center and an adjunct assistant

professor of emergency medicine at the University of Maryland School of Medicine.

Marijuana was the most common individual drug detected at both hospitals. Moreover, a fifth to a third of specimens at each hospital tested positive for a new psychoactive substance other than synthetic cannabinoids.

Most striking, two-thirds of patients at both hospitals tested positive for multiple substances, and some specimens contained as many as six substances, potentially complicating an overdose diagnosis.

Regional Drug Use Variations

In Baltimore, after marijuana, people tested positive primarily for fentanyl, a highly potent synthetic opioid; in Prince George's County, the drug detected was PCP, an illegal hallucinogenic drug that can trigger aggression and other behavior changes.

The Baltimore region has a long history of opioid-related problems, beginning with heroin, then more recently transitioning to fentanyl and its relatives. At UMMC Midtown, non-fentanyl opioids including morphine and codeine were found in 51 percent of urine samples, while 28 percent tested positive for fentanyl. Midtown emergency physician Zachary D.W. Dezman, MD, says the deaths of nearly 700 people in Baltimore were linked to opioids in 2017.

At UM Prince George's, 47 percent of specimens had PCP and patients were three-to-four times more likely than those at Midtown to show "bizarre or aggressive behavior," according to the physicians.

The study was not designed to determine differences in mortality, but emergency physicians at both hospitals say anecdotally that despite the

constantly changing soup of drugs patients take, treating the patient based on their symptoms seemed to work. "These results suggest that supportive care is safe in patients suffering from acute intoxication from synthetic cannabinoids," says Dr. Dezman, also an assistant professor of emergency medicine at the University of Maryland School of Medicine.

The addition of fentanyl screening to the standard drug tests used in hospitals would be useful, Dr. Dezman says. While the results of the urine drug screen are not critical to the patient's emergency care, "it is important to inform patients of the risks of their substance use once they are stabilized." He says a number of patients have requested substance abuse treatment once they learned they had inadvertently used fentanyl. As well, he says hospital testing could illuminate the bigger fentanyl picture. "Policy makers and public health officials cannot make informed policy decisions about combating fentanyl if we do not know the prevalence of fentanyl use in the community."

"This report underscores one of the benefits of cross-campus collaboration to harness research and clinical synergies that translate to improved patient care," says E. Albert Reece, MD, Ph.D., MBA, executive vice president for medical affairs at the University of Maryland, the John Z. and Akiko K. Bowers Distinguished Professor and dean of the University of Maryland School of Medicine.

More information: Wish ED, Billing AS, Artigiani EE, Dezman Z, Schwartz B, Pueschel J. "Drug Early Warning from Re-Testing Biological Samples: Maryland Hospital Study." Office of National Drug Control Policy. Washington, DC: Executive Office of the President. July 2018

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