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Fentanyl exposure among patients seeking opioid treatment

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Abstract

Aim: Overdoses attributed to the potent opioid agonist fentanyl have substantially increased in recent years. Despite these serious public health consequences, many opioid treatment providers do not currently include a fentanyl assay in their urine toxicology testing. As a result, extent of fentanyl exposure and related risks among individuals with opioid use disorder often remains unknown. We examined the prevalence of fentanyl exposure among patients seeking or enrolled in opioid agonist treatment.

Methods: Six hundred urine specimens were collected from adults entering (n=100) or enrolled in (n=500) opioid agonist treatment and analyzed using the clinic's standard opioid panel, supplemented with a 100 ng/ml fentanyl assay.

Results: Of the 100 specimens collected from patients at treatment intake, 19 (19%) tested positive for fentanyl. Importantly, 17 (90%) of those fentanyl-positive specimens were also positive for heroin. Of the 500 collected from patients in treatment, 17 (3%) of specimens tested positive for fentanyl. Of those, 11 (92%) were also positive for heroin.

Conclusion: These data illustrate a concerning degree of fentanyl exposure among patients seeking treatment and suggest that much of this exposure may have stemmed from fentanyl-containing heroin. Given the unprecedented recent surges in fentanyl-related overdoses, efforts to identify fentanyl exposure are critical. In particular, the point of treatment entry permits a rare systematic opportunity for medical and clinical staff to address fentanyl use and risks with incoming patients.

Keywords

fentanyl; opioid use disorder; agonist maintenance; methadone; buprenorphine; overdose

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1. Introduction

Fatal and non-fatal overdoses attributed to the potent opioid agonist fentanyl and other synthetic opioids have substantially increased in recent years (Jones, Einstein, & Compton, 2018; O'Donnell, 2017). In a recent report from the Centers for Disease Control (CDC), for example, fentanyl was detected in 56% of the opioid overdose deaths in the 10 states that make up the CDC's Enhanced State Opioid Overdose Surveillance program (O'Donnell, 2017). Further, of the opioid overdose deaths involving fentanyl, 97% were determined by medical examiner or coroner to be directly caused by fentanyl.

Much of the existing information on extent of fentanyl exposure in the United States (US) is based on data from death certificates and medical examiner reports, with some additional epidemiological reports among individuals with opioid use disorder (OUD)(Cicero, Ellis, & Kasper, 2017; O'Donnell, 2017; Slavova et al., 2017; Somerville, 2017). Little is known, however, about the extent of fentanyl use or exposure among individuals seeking or enrolled in opioid treatment. This information is important, as opioid treatment providers have a unique opportunity to screen for and clinically address intentional or unintentional fentanyl use among individuals with OUD. To our knowledge, only two studies in the US have examined the prevalence of fentanyl use (Arfken, Suchanek, & Greenwald, 2017; Kenney, Anderson, Conti, Bailey, & Stein, 2018). In one, of urine specimens collected over a 17-month period from 368 patients undergoing methadone maintenance treatment in an urban clinic in Detroit, Michigan, 7% tested positive for fentanyl (Arfken, Suchanek, & Greenwald, 2017). In the second report, among 231 patients entering an inpatient methadone taper program in Fall River, Massachusetts, 87% of urine specimens tested positive for fentanyl (Kenney, Anderson, Conti, Bailey, & Stein, 2018). However, these existing studies involved two unique clinical populations and reported very disparate findings, which may reflect differences in geography and time period of data collection.

We sought to build on this knowledge in two ways. First, in addition to examining the degree of fentanyl exposure among patients currently enrolled in treatment, it is critical to understand the scope of fentanyl exposure at the point of treatment entry as the intake process provides a rare systematic opportunity for medical and clinical staff to address fentanyl use and risks with patients. Second, it is important to examine whether the above findings from urban clinics extend to the rural geographic areas that have been particularly hard hit by opioid-related overdoses (Jozaghi & Marsh, 2017; Rigg, Monnat, & Chavez, 2018; Slavova et al., 2017). In Vermont, for example, the number of fatalities involving fentanyl has more than doubled since 2015 alone, and fentanyl is currently involved in two-thirds of all opiate-related fatalities (Vermont Department of Health, 2018).

2. Methods

Six hundred anonymized urine specimens were collected between September 2016 and February 2017 in an opioid treatment program (OTP) in Burlington, Vermont. The OTP is the largest in Vermont and provides methadone and buprenorphine on an outpatient basis, along with psychosocial services (e.g., counseling, case management). One hundred urine specimens were obtained consecutively from individuals completing an intake screening for

treatment. An additional 500 specimens were tested from patients already enrolled in methadone or buprenorphine maintenance who provided specimens on a random schedule during treatment (i.e., without advance notice and approximately one time per month). All specimens were collected under same-sex staff observation and screened via enzyme multiplied immunoassay (Microgenics, CA) for methadone, buprenorphine, oxycodone, hydrocodone, hydromorphone and opiates (heroin, morphine). We also supplemented the clinic's standard opioid panel with a 100 ng/ml fentanyl dipstick (All Tests, AZ).

3. Results

Of the 100 specimens obtained from patients at treatment intake, 19 (19%) tested positive for recent fentanyl use. Of those fentanyl-positive specimens, 17 (90%) were also positive for heroin. Of the 500 specimens collected from patients already enrolled in treatment, 17 (3%) tested positive for recent fentanyl use. Of those, 11 (92%) were also positive for heroin.

We also examined how often heroin-positive specimens tested positive for fentanyl. Of the 100 specimens collected from patients at intake, 50 tested positive for heroin. Of those heroin-positive specimens, 17 (34%) also tested positive for recent fentanyl exposure. Among the 500 specimens collected from patients enrolled in treatment, 16 tested positive for heroin and, of those, 11 (68%) were also positive for fentanyl.

4. Discussion

There was a concerning degree of fentanyl exposure among patients seeking treatment for OUD, with nearly one-fifth of individuals testing positive. These data extend prior findings from urban areas to the rural geographic areas that have been particularly hard hit by opioid-related overdoses (Jozaghi & Marsh, 2017; Rigg et al., 2018; Slavova et al., 2017). The vast majority of fentanyl-positive specimens tested positive for heroin. This is consistent with prior data suggesting that much of the fentanyl exposure among illicit opioid users likely stems from use of fentanyl-laced heroin (Arfken et al., 2017; Griswold et al., 2017; Jones, Baldwin, & Compton, 2017; Slavova et al., 2017; Somerville, 2017).

Relative to the intake cohort, prevalence of fentanyl exposure was lower among enrolled patients. These data are consistent with prior reports from urban US clinics (Arfken et al., 2017; Kenney et al., 2018) and suggest that expanding opioid treatment access is an important and effective response to addressing the fentanyl public health crisis (Arfken et al., 2017; Frank & Pollack, 2017; Jones et al., 2018; Jozaghi & Marsh, 2017; Kenney et al., 2018; Rigg et al., 2018; Somerville, 2017).

Several limitations should be noted. Because this clinic project used de-identified urine specimens, we did not collect data on demographic or treatment-related details or information about patients' intentions or awareness of fentanyl exposure. Another limitation is that these specimens were collected from a single clinic. Future studies should examine fentanyl prevalence from other treatment programs (e.g., office-based buprenorphine treatment) and other geographic locations. We also selected a fentanyl dipstick that could be readily adopted by real-world community clinics to provide immediate results without the

costs and delays associated with sending specimens to a central laboratory (Cicero et al., 2017; Griswold et al., 2017; Slavova et al., 2017). However, this qualitative test did not permit the levels of sensitivity or specificity for detecting the various other fentanyl analogues (e.g., carfentanil, sufentanil, etc.) or novel synthetic opioids (e.g., U-47700) that more sophisticated toxicology methods (e.g., mass spectrometry) offer. Finally, although we did observe lower fentanyl exposure among enrolled versus incoming patients, our analyses did not prospectively examine the extent to which fentanyl exposure rates change from treatment entry to enrollment within patients and future studies should evaluate this.

These data highlight the scope of fentanyl exposure among rural Vermonters with OUD, particularly among those presenting for OAT treatment intake between 2016-2017. Despite this, many treatment programs are not currently equipped to detect fentanyl use (Cicero et al., 2017; Griswold et al., 2017; Slavova et al., 2017; Somerville, 2017). All opioid treatment providers should strongly consider incorporating fentanyl testing into their clinical procedures and use this critical information to guide discussions and clinical decisions during their earliest interactions with patients. Additionally, given the increasing prevalence of fentanyl and synthetic opioids in supplies of cocaine, benzodiazepines, methamphetamine, and counterfeit pills (Jones et al., 2018), fentanyl testing should be also adopted by programs treating individuals with non-opioid substance use disorders.

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Highlights

- Efforts to identify and address fentanyl exposure are critical.
- One-fifth of adults seeking opioid agonist treatment at one center tested positive for fentanyl.
- Nearly all fentanyl-positive specimens also tested positive for heroin.
- Treatment intake permits an opportunity to address fentanyl use and risks with patients.