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Research Paper

Being "hooked up" during a sharp increase in the availability of illicitly manufactured fentanyl: Adaptations of drug using practices among people who use drugs (PWUD) in New York City

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ABSTRACT

Illicitly manufactured fentanyl (IMF), a category of synthetic opioids 50–100 times more potent than morphine, is increasingly being added to heroin and other drugs in the United States (US). Persons who use drugs (PWUD) are frequently unaware of the presence of fentanyl in drugs. Use of heroin and other drugs containing fentanyl has been linked to sharp increases in opioid mortality. In New York City (NYC), opioid-related mortality increased from 8.2 per 100,000 residents in 2010 to 19.9 per 100,000 residents in 2016; and, in 2016, fentanyl accounted for 44% of NYC overdose deaths. Little is known about how PWUD are adapting to the increase in fentanyl and overdose mortality. This study explores PWUDs' adaptations to drug using practices due to fentanyl. In-depth qualitative interviews were conducted with 55 PWUD at three NYC syringe services programs (SSP) about perceptions of fentanyl, overdose experiences and adaptations of drug using practices.

PWUD utilized test shots, a consistent drug dealer, fentanyl test strips, naloxone, getting high with or near others and reducing drug use to protect from overdose. Consistent application of these methods was often negated by structural level factors such as stigma, poverty and homelessness. To address these, multi-level overdose prevention approaches should be implemented in order to reduce the continuing increase in opioid mortality.

Background

Illicitly manufactured fentanyl (IMF), acategory of short-acting opioids containing non-pharmaceutical fentanyl and non-pharmaceutical fentanyl analogs, ranges in potency from 50 to 100 times that of morphine (Suzuki & El-Haddad, 2017). IMF (henceforth referred to as fentanyl) is increasingly being used as an additive to heroin and other drugs in the United States (US), (Administration & Division, 2016; CDC Health Action Network, 2016; CDC Health Alert Network, 2015; Ciccarone, 2017; Prekupec, Mansky, & Baumann, 2017; Sutter et al., 2017; Tomassoni et al., 2017). In 2014, fentanyl represented 4% of the opioids submitted to the Drug Enforcement Administration (DEA) laboratory system (Drug Enforcement Administration, 2015), compared to 66% in 2017 (Drug Enforcement Administration Special Testing & Research Laboratory, 2017b) and 74% in the first quarter of 2018 (Drug Enforcement Administration Special Testing & Research Laboratory, 2018). Further, in some illicit drug markets in the US, fentanyl is believed to be replacing heroin altogether (U.S. Department of Justice Drug Enforcement Admnistration, 2017).

In addition to heroin, fentanyl has also been detected as an additive in other drugs, including cocaine (Drug Enforcement Administration Special Testing & Research Laboratory, 2017a; New York City Department of Health & Mental Hygiene, 2017a; Tomassoni et al., 2017), methamphetamine (New York City Department of Health & Mental Hygiene, 2017b), ketamine (New York City Department of Health & Mental Hygiene, 2017b) and counterfeit opioid analgesics (CDC Health Action Network, 2016; Drug Enforcement Administration Special Testing & Research Laboratory, 2017a; Drug Enforcement Administration, 2016; New York City Department of Health & Mental Hygiene, 2017b; Sutter et al., 2017; Tomassoni et al., 2017) and benzodiazepines (New York City Department of Health & Mental Hygiene, 2017b). These data suggest that fentanyl may be reaching opioid naïve PWUD, which could further increase overdose risk.

Between 2015–2016, seventeen different fentanyl analogs were identified in the US through drug seizures (Drug Enforcement Administration & Control Division, 2017). These analogs ranged in potency from 1.5 to 10,000 times that of morphine (Prekupec et al., 2017; Suzuki & El-Haddad, 2017). Primarily manufactured in labs in

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China and brought into the US via mail or smuggled from Mexico (U.S. Department of Justice Drug Enforcement Admnistration, 2017), fentanyl and its analogs are visually indiscernible from one another, making it difficult to detect differences between them without thorough laboratory testing (Suzuki & El-Haddad, 2017). Persons who use drugs (PWUD) are often unaware when drugs are "cut", or mixed with fentanyl (Carroll, Marshall, Rich, & Green, 2017; Macmadu, Carroll, Hadland, Green, & Marshall, 2017; Mars, Ondocsin, & Ciccarone, 2017; Spies et al., 2016; Stogner, 2014). Consequently, use of drugs containing fentanyl have been linked to sharp increases in rates of opioid morbidity and mortality (Centers for Disease Control & Prevention, 2017; Daniulaityte et al., 2017; Katz, 2017; Marshall et al., 2017; O'Donnell, Halpin, Mattson, Goldberger, & Gladden, 2017; Rudd, Aleshire, Zibbell, & Gladden, 2016; Rudd, Seth, David, & Scholl, 2016; Slavova et al., 2017).

In New York City (NYC), despite the implementation of a multi-pronged approach to stem the tide of opioid mortality, including increasing the availability of buprenorphine treatment, expansion of naloxone distribution, reducing opioid prescribing, a citywide public awareness campaign, a rapid response investigation of overdose "outbreaks" and a peer-based non-fatal overdose response system to prevent future overdoses, the rate of opioid mortality remains unabated (The City of New York Office of the Mayor, 2017). Between 2010–2016, opioid mortality rose from 8.2 per 100,000 residents to 19.9 per 100,000 residents in NYC, largely due to fentanyl (Goodman, 2018; Paone, Tuazon, Nolan, & Mantha, 2016). Prior to 2015, fentanyl accounted for less than 3% of NYC overdose deaths annually, increasing to 16% in 2015 and 44% in 2016 (Paone & Kunins, 2016). While the majority of overdose deaths involving fentanyl in NYC were mixed with heroin (61%) in 2016, 37% were a combination of cocaine and fentanyl, without heroin, an increase from 11% in 2015 (Press Release: Health Department Warns New Yorkers about Cocaine Laced with Fentanyl; Occasional Users at High Risk for Overdose, 2017). Finally, data collected from illicit drug seizures, compiled by the National Forensic Laboratory Information System (NFLIS), also indicate a sharp increase in the prevalence of fentanyl in drug seizures in NYC. Between 2015–2016, fentanyl seizures in NYC increased from 214 to 1,699, representing a 694% increase in just one year (Press Release: Health Department Warns New Yorkers about Cocaine Laced with Fentanyl; Occasional Users at High Risk for Overdose, 2017).

As opioid-related mortality has increased, many harm reduction, drug treatment and other public health programs have provided lay-person overdose prevention trainings, including education about risk factors, practical tools for responding to an overdose, such as training on naloxone administration, and harm reduction strategies PWUD can employ to lower overdose risk (Wheeler, Jones, Gilbert, Davidson, & Centers for Disease Control and Prevention (CDC), 2015). Some of the strategies recommended include: use one drug at a time, test the potency of the drug by using a small amount, and use with another person in case of emergency (Wheeler, Burk, McQuie, & Stancliff, 2012). A limited number of harm reduction programs in the US have also begun to distribute fentanyl test strips (FTS) to PWUD. Designed for urinalysis testing, FTS are being used off-label to test for the presence of fentanyl in drug solutions. While FTS have been found to possess a high degree of sensitivity and specificity, detecting very low concentrations of fentanyl (Sherman & Green, 2018), some have expressed concern that the high sensitivity of the test could lead to complacency if users of FTS repeatedly receive positive results with no associated effect (McGowan, Harris, Platt, Hope, & Rhodes, 2018).

Research regarding potential changes in PWUDs' drug using behaviors due to the increased prevalence of fentanyl is scant. In an investigation of the changing landscape of heroin in Baltimore, including the emergence of fentanyl, Mars et al found that some PWUD were using test shots, or smaller doses of drugs to gauge potency, and others were carrying naloxone and/or using in the company of others in order to prevent fatal overdose (Mars et al., 2017). Similarly, in a study of persons who inject drugs (PWID) in Baltimore, Chicago, Massachusetts, New Hampshire and San Francisco, Mars et al found that PWID utilized a variety of drug sampling methods to gauge heroin potency, including snorting and tasting, test shots, half dose shots and following friends' assessment of the potency and amount of heroin to use (Mars, Ondocsin, & Ciccarone, 2018). In an investigation of perceptions of fentanyl in Providence, RI, Carroll et al found that PWUD were employing a variety of methods to reduce their risk of overdose, including using test shots, relying on a trusted drug dealer in order to ensure a more predictable high, using prescription opioids instead of heroin, snorting drugs instead of injecting them and initiating buprenorphine treatment to stop drug use altogether (Carroll et al., 2017). This paper presents findings from an in-depth qualitative study of the ways in which PWUD who are "hooked up", or physically dependent on opioids, are adapting to the ongoing increase in fentanyl and opioid mortality in NYC.

Methods

People who use drugs were recruited from three New York City (NYC) syringe services programs (SSP) to take part in a study about their experiences with fentanyl. SSP were located in three NYC neighborhoods: (1) South Bronx, (2) Brighton Beach, Brooklyn and (3) Downtown Brooklyn. Potential study participants were identified by SSP staff via convenience sampling, based on staff knowledge about their experiences with fentanyl. Individuals were then referred to the researcher to verify study eligibility (i.e., individuals with personal experience with fentanyl, or suspected fentanyl; or individuals that have witnessed another individual using fentanyl, or suspected fentanyl; ≥ 18 years of age; and fluent English speakers), and provide study consent. The researcher administered a short, quantitative questionnaire about demographics, drug use history and experiences with overdose, followed by a longer, semi-structured interview that was audio-recorded for the purpose of transcription. Topics for the semi-structured interview included: current drug use, perceptions of fentanyl, experiences with fentanyl and adaptations of drug using practices due to fentanyl and overdose. Interviews lasted between 20–40 min and participants were compensated $15 for their time. The study was approved by the Mount Sinai Institutional Review Board and a Federal Certificate of Confidentiality was obtained to provide further confidentiality protections. Pseudonyms have been used throughout this paper to protect the identity of study participants.

Descriptive statistics of demographic variables collected in the quantitative survey were calculated using SAS Statistical Software, version 9.4. Transcription of qualitative interviews was provided by a third party service and interviews were coded by the lead researcher using Atlas.ti software, version 8.0. Exploratory interview methods were utilized to capture the breadth of PWUDs' experiences with fentanyl, and inductive, thematic analysis was conducted to categorize them (Guest, MacQueen, & Namey, 2012). These methods allowed for both the investigation of a priori questions, as well as discussion and identification of emergent ideas and patterns.

Results

Between February–August 2017, fifty-five PWUD were interviewed for this study. As described in Table 1, slightly more than half of the sample was recruited from the Bronx. The mean age of participants was 47, and two-thirds were male. Study participants could identify by race and/or ethnicity. Half of the sample identified as Hispanic, close to one-third White and a quarter Black. The average age of first drug use was 16 years, first opioid use was 21 and first injection was 24. Most study participants' first drug used was marijuana (62%), and an overwhelming majority currently injected drugs (85%). Heroin via injection was the most commonly used drug and administration route. The majority of participants had witnessed an overdose at some point in their