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Short Communication

Prevalence and correlates of fentanyl-contaminated heroin exposure among young adults who use prescription opioids non-medically

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HIGHLIGHTS

- 11% of sample reported recent exposure to fentanyl-contaminated heroin (FCH).
- FCH users reported greater and more extensive drug use experiences.
- Most reported that FCH provides a better high than heroin.
- All acknowledged that FCH use increases overdose risk.
- Most were unaware that their heroin was contaminated with fentanyl prior to use.

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ABSTRACT

Background: The rate of overdose deaths caused by fentanyl-contaminated heroin (FCH) use is increasing rapidly in the United States. We examined risk factors for exposure to FCH and experiences with FCH use among young adult non-medical prescription opioids (NMPO) users.
Methods: We analyzed data from the Rhode Island Young Adult Prescription Drug Study (RAPiDS), which enrolled young adults aged 18 to 29 reporting prior 30 day NMPO use between January 2015 and February 2016. Participants completed questionnaires ascertaining drug use patterns and risk behaviors, including FCH exposure. Logistic regression was used to assess factors associated with known or suspected FCH exposure.
Results: Of 199 participants, the median age was 25 (IQR: 22, 27), 130 (65.3%) were male, and 122 (61.3%) were of White, non-Hispanic race/ethnicity. In total, 22 (11%) reported known or suspected FCH exposure in the prior six months. Several drug use patterns and risk behaviors were associated with FCH exposure, including: regular heroin and cocaine use; diverted pharmaceutical fentanyl use in the prior six months; NMPO use to avoid withdrawal symptoms; longer duration of NMPO use; regular injection drug use; and prior overdose (all $p < 0.001$). Among participants who reported FCH exposure, 59% were unaware that their heroin was contaminated with fentanyl prior to last use, 59% reported that FCH provides a better high, and all recognized that fentanyl increases overdose risk.
Conclusions: Exposure to fentanyl-contaminated heroin is an emerging trend among young adult NMPO users in Rhode Island. Overdose prevention programs addressing FCH use are urgently needed.

1. Introduction

Opioid use disorder and opioid overdose are escalating epidemics in the United States. From 2000 to 2014, the rate of opioid-involved overdose deaths increased by 200% (Rudd, Aleshire, Zibbell, & Gladden, 2016). During this period, non-medical prescription opioid (NMPO) use was a driver of overdose-related mortality (Calcaterra, Glanz, & Binswanger, 2013). However, more recent national data suggest shifting trends, with heroin-involved overdose deaths increasing more than three-fold between 2010 and 2014 (Compton, Jones, & Baldwin, 2016).

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Across the US, and particularly in New England, rates of fatal overdose have been exacerbated by fentanyl-contaminated heroin (FCH) and other forms of illicit fentanyl use (Centers for Disease Control and Prevention, 2015). From 2013 to 2014, overdose death rates involving synthetic opioids (including fentanyl) increased 80% (Rudd et al., 2016). In 2015, half of all overdose deaths in Rhode Island involved fentanyl and fentanyl analogs—an increase from 37% in 2014 and <5% in the years prior to 2014 (Rhode Island Governor's Overdose Prevention and Intervention Task Force, 2015). Eighty-six fentanyl deaths occurred in Maine in 2015, up from only 2 in 2013 (Sorg, Greenwald, & Wren, 2016), and fentanyl was attributed to five times as many deaths as heroin in 2015 in New Hampshire (New Hampshire Office of the Chief Medical Examiner, 2016). Given this emerging crisis, there is an urgent need to identify persons who may be at risk for fentanyl-related overdose and to understand users' experiences with FCH.

The purpose of this study was to identify correlates of self-reported use of heroin that is known or suspected to have been adulterated with fentanyl (hereafter referred to as FCH exposure) and to examine users' experiences with FCH. To the authors' knowledge, this study is among the first to explore correlates of FCH exposure and examine first-hand experiences with and attitudes toward FCH among young adults in the US.

2. Materials and methods

2.1. Study design and sample

The data analyzed here were collected as a part of a pilot study that assessed the patterns and determinants of NMPO use among young adults. From January 2015 to February 2016, the Rhode Island Young Adult Prescription Drug Study (RAPiDS) recruited 200 Rhode Island residents aged 18–29 who endorsed prior-30-day NMPO use. Participants were compensated $25 for their time. This study was approved by the Institutional Review Board (IRB) at Brown University.

Participants were recruited through a combination of targeted canvassing, snowball sampling, and internet-based recruitment from online classifieds, drug information websites, and social media. Throughout the recruitment period, paper recruitment flyers were placed in and distributed from Rhode Island-based substance use treatment centers, recovery support centers, urgent care centers, and service agencies (e.g., syringe exchange programs); street canvassing was also utilized in major Rhode Island cities.

Snowball sampling methods were utilized in the first recruitment phase. During this phase, each participant was asked to refer up to two eligible peers. For referrals that were redeemed, the referring participant received one $5 gift card via mail or in person. Referred participants were also invited to refer their peers to the study, and so forth, until several recruitment chains were produced.

Internet-based recruitment methods were utilized in the second recruitment phase. Participants were recruited from online classified sites (e.g., Craigslist), drug information sites (e.g., Bluelight.org), and social media sites (e.g., Facebook). Search engine-based banner advertising was also used to target Rhode Island-based individuals searching relevant terms (e.g., opioid, pills).

Participants were interviewed individually by trained personnel in private settings. Computer-assisted personal interviewing (CAPI) was used to collect socio-demographic data and drug use patterns; computer-assisted self-interviewing (CASI) was used to collect particularly sensitive or stigmatizing information (e.g., injection drug use).

2.2. Measures

2.2.1. Non-medical fentanyl use

All participants were asked whether they had ever engaged in non-medical fentanyl use, defined as use "without a doctor's orders or not as a doctor directed". Participants who endorsed lifetime non-medical fentanyl use were asked which formulations of fentanyl they had used in the prior six months. Response options included "skin patch", "pills", "nasal spray", "lozenge/lollipop", "a film that dissolves under your tongue", and "fentanyl-laced heroin". Participants who endorsed this last option were considered as having known or suspected FCH exposure in the prior six months; an affirmative answer to any other response option was defined as any diverted fentanyl use in the prior six months. Those who endorsed FCH use were asked whether—at their most recent use of FCH—they were aware of fentanyl contamination prior to use. We also assessed frequency of FCH use in the prior six months (response options were "never", "once or a couple of times", "about once a month", "at least every week", and "every day"), and we solicited experiences with and attitudes toward FCH. Covariates of interest were socio-demographic characteristics, drug use patterns and risk behaviors, and clinical factors.

2.2.2. Socio-demographic characteristics

We assessed age, male sex at birth, race/ethnicity (categorized as White, non-Hispanic vs. other), educational attainment beyond high school, as well as lifetime history of detainment in a jail/prison and homelessness.

2.2.3. Drug use patterns and risk behaviors

Drug use patterns assessed included regular use of heroin, NMPO use, cocaine use, injection drug use, and non-medical benzodiazepine use, which we defined as weekly or greater in the prior six months. Non-medical prescription drug use was defined as use "without a doctor's orders or not as a doctor directed," and to improve measurement validity, the images and brand names of several prescription opioids (e.g., Vicodin, OxyContin) and benzodiazepines (e.g., Xanax, Valium) were included in the assessment. Participants reported their duration of NMPO use (in years), as well as whether they primarily use prescription opioids to avoid withdrawal symptoms. We also assessed lifetime history of witnessing and experiencing an overdose.

2.2.4. Clinical factors

We examined history of any mental health diagnosis, self-reported positive hepatitis C virus (HCV) status among those who had ever tested for HCV, and whether participants had ever been prescribed an opioid.

2.3. Statistical analyses

Given the low prevalence of FCH exposure in the sample, bivariable logistic regression was used to assess factors associated with the outcome. Descriptive statistics were generated to characterize experiences with and attitudes toward FCH. One participant was excluded due to missing data. Statistical analyses were conducted using SAS version 9.4. All p-values are two-sided.

3. Results

Among the 199 participants who were included in these analyses, the majority was male (65.3%), and the median age was 25 (interquartile range [IQR]: 22–27). While the majority was White/non-Hispanic (61.3%), collectively, a substantial fraction of the sample was black (16.6%), multi-racial (15.1%), or ethnically Latino/a (14.1%). The prevalence of FCH exposure in the prior six months was 11.1% (n = 22). Along with age, White race/ethnicity, and lifetime homelessness, FCH exposure was significantly associated with several drug use patterns and risk behaviors, including: regular heroin and cocaine use; regular injection drug use; diverted pharmaceutical fentanyl use in the prior six months; regular non-medical benzodiazepine use; NMPO use primarily to avoid withdrawal symptoms; and longer duration of NMPO use (all $p < 0.05$, see Table 1). The majority of participants reporting FCH exposure had ever experienced an overdose (63.6%), compared to only 22.0% of non-exposed participants (unadjusted odds ratio = 6.2,