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Research Paper

Multiple injections per injection episode: High-risk injection practice among people who injected pills during the 2015 HIV outbreak in Indiana

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ABSTRACT

Background: Misuse of prescription opioid analgesics (POA) has increased dramatically in the US, particularly in non-urban areas. We examined injection practices among persons who inject POA in a rural area that experienced a large HIV outbreak in 2015.
Methods: Between August-September 2015, 25 persons who injected drugs within the past 12 months were recruited in Scott County, Indiana for a qualitative study. Data from in-depth, semi-structured interviews were analyzed.
Results: All 25 participants were non-Hispanic white and the median age was 33 years (range: 19–57). All had ever injected extended-release oxymorphone (Opana® ER) and most (n = 20) described preparing Opana® ER for multiple injections per injection episode (MIPIE). MIPIE comprised 2–4 injections during an injection episode resulting from needing >1 mL water to prepare Opana® ER solution using 1 mL syringes and the frequent use of "rinse shots." MIPIE occurred up to 10 times/day (totaling 35 injections/day), often in the context of sharing drug and injection equipment.
Conclusions: We describe a high-risk injection practice that may have contributed to the rapid spread of HIV in this community. Efforts to prevent bloodborne infections among people who inject POA need to assess for MIPIE so that provision of sterile injection equipment and safer injection education addresses the MIPIE risk environment.

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Background

Over the past 15 years, the use of prescription opioid analgesics (POA) has increased dramatically in the United States, particularly in non-urban areas, with a growing number of people moving beyond ingesting and insufflating pain pills to injecting them (Cicero, Surratt, Inciardi, & Munoz, 2007; Paulozzi, Mack, & Hockenberry, 2014; Rudd, Aleshire, Zibbell, & Gladden, 2016; Surratt, Kurtz, & Cicero, 2011; Young & Havens, 2012). Increases in the number of people who inject drugs (PWID) have contributed to dramatic increases in incident hepatitis C virus (HCV) infections, with young PWID (age < 30 years) comprising a majority of new cases (Suryaprasad et al., 2014). Diagnoses of HIV infection among PWID have been steadily decreasing since peaking in the 1990s, due largely to effective prevention efforts for PWID. Yet recent HIV surveillance data suggest behavioral and demographic trends associated with the opioid epidemic may threaten these earlier successes (Van Handel et al., 2016; Wejnert et al., 2016). Injecting POA may further amplify these risks; there is growing evidence that persons who inject POA are at higher risk for HCV infection than persons who inject heroin and other drugs but not POA (Bruneau, Roy, Arruda, Zang, & Jutras-Aswad, 2012; Zibbell, Hart-Malloy, Barry, Fan, & Flanigan, 2014). Given that injection drug use

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is an important risk factor for both HIV and HCV infection, the findings of increased HCV risk associated with POA injecting also have serious implications for HIV prevention. The largest injection-related HIV outbreak to date in a non-urban region of the United States was linked to the injection of POA extended-release oxymorphone (Opana® extended release [ER] with INTAC®, hereafter Opana® ER) (Peters et al., 2016). These findings highlight the need for improved understanding of the types of opioid formulations being injected and the mechanics involved in preparing them for injection so that risk reduction interventions can be designed specifically for pill injection. At present, there is a paucity of data on injection practices and related health risks associated with pill injecting, particularly in non-urban settings. We present findings from a qualitative study conducted in Scott County, Indiana, the epicenter of the HIV outbreak, among PWID to examine the types of prescription opioids and injection techniques that may have contributed to the rapid dissemination of HIV in this rural community.

Methods

From November 18, 2014 to November 1, 2015, 181 new HIV diagnoses were made in Scott County, Indiana (estimated population, 14,799 persons aged 18–65 years in 2014) and HIV control and prevention measures were implemented, including a syringe services program (SSP) (Peters et al., 2016). The SSP (the first in the state of Indiana) was established on April 4, 2015, within one week of the Indiana Governor declaring a public health emergency, and operated by Scott County Health Department. The SSP included both a fixed-site and mobile outreach services, with program participants provided one week's supply of sterile syringes based on the number of syringes returned and the reported frequency of daily injections.

In August-September, 2015, face-to-face, in-depth interviews were conducted with 25 PWID using semi-structured, open-ended interview guides. Several convenience-sampling methods were used to obtain a wide cross-section of injection networks and representation by key characteristics (e.g., age, sex, HIV/HCV status), including recruitment in the SSP, street-based recruitment, and peer-driven referral. Eligible participants were ≥18 years, resided in Scott County, were able to complete the interview in English, and reported injecting drugs in the past 12 months. Drug injection was confirmed by examining physical marks of recent injection. Interviews with consented participants were digitally recorded, transcribed, cross-checked, and prepared for descriptive analyses using NVivo 10 software. To enhance rigor, two researchers analyzed data by independently reviewing transcripts and then comparing notes for inter-coder agreement. Transcripts were coded into broad categories and then subcoded into refined categories for detailed descriptions of injection practices.

The interviews were anonymous; no names or other identifying information were collected. Human subjects and ethics review and approvals were received for the study from the institutional review boards of the Centers for Disease Control and Prevention and Indiana University.

Results

Table 1 reports participant characteristics and self-reported HIV and HCV status. All 25 participants were non-Hispanic white: 11 were women and the median age was 33 years (range: 19–57). All participants reported having ever injected Opana® ER. Most (n = 22) reported injecting Opana® ER as their primary drug within the 12 months prior to the interview; 1 reported primarily injecting Opana® immediate release (IR), and 2 primarily injected methamphetamine. Ten participants were HIV positive and 21 were HCV positive.

Table 1
Demographic Characteristics, Drug Injection, and Self-Reported HIV and HCV Status of Study Participants Who Injected Drugs during the 2015 HIV Outbreak in Rural Indiana[a] (n = 25).

Characteristic	n (%)
Age (years)	
19–29	*10 (40)*
30–39	*9 (36)*
≥40	*6 (24)*
Median (range)	*33 years (19–57)*
Race/ethnicity	
Non-Hispanic white[b]	25 (100)
Gender	
Male	14 (56)
Female	11 (44)
Ever injected Opana[c]	
Yes	25 (100)
No	0 (0)
Drug injection, past 12 months	
Currently injects	22 (88)
Injected in the past 12 months, but not currently	3 (12)
Primary drug injected, past 12 months	
Opana[b]	22 (88)
Immediate-release oxymorphone	1 (4)
Methamphetamine	2 (8)
Self-reported HIV status	
Positive	10 (40)
Negative	15 (60)
Self-reported HCV status	
Positive	21 (84)
Negative	4 (16)

[a] All participants were aware of the HIV outbreak in this community at the time of the interview.
[b] Race/ethnicity of participants reflects background race/ethnicity of the community (http://quickfacts.census.gov/qfd/states/18/18143.html).
[c] OPANA® ER with INTAC®, a proprietary formulation of extended-release oxymorphone encapsulated with a non-FDA-approved tamper-resistant coating.

In contrast to Opana® IR and the type of heroin and methamphetamine available in this rural part of Indiana, all of which dissolve relatively easily in aqueous solution, study participants described a multi-step process to prepare Opana® ER for injection (Table 2, a). To circumvent Opana® ER's crush-resistant technology (INTAC®), the pill was heated for several minutes in a conventional oven or, more commonly, directly in a cooker by applying heat to both the bottom of the cooker and the top of the pill. Participants referred to this process as "browning." Browning the pill made it malleable, softening it just enough so it could be crushed with the force of finger pressure. Participants described browning the entire 40 mg Opana® ER pill or, more commonly, a quarter of the pill. The cost of Opana® ER in this community was very high ($120–160 per pill) but reduced portions of the pill were available for purchase at $30–40 per quarter (10 mg). Participants reported that quarter portions were a more affordable option for most PWID in the county, which translated to quarter pills being the common dose used/shared during single injection episodes (Table 2, c).

Once the browned pill was sufficiently mashed, water was added to it in the cooker and the mixture was then manipulated with a finger or the back of the syringe plunger to further aid in dissolving the pill. Participants reported using between 1.2 and 1.7 mL of water volume for each quarter of a 40 mg browned pill. The outcome was an Opana-based solution whose total volume