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In-hospital illicit drug use, substance use disorders, and acceptance of residential treatment in a prospective pilot needs assessment of hospitalized adults with severe infections from injecting drugs

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ABSTRACT

Objective: To conduct a pilot needs assessment of underlying substance use disorders (SUD), motivation for SUD treatment, and willingness to enter residential SUD treatment in hospitalized adults who inject drugs with complex infections requiring intravenous (IV) antibiotics, and to assess the presence of in-hospital illicit substance use.

Patients and methods: From March 8, 2016 through August 25, 2016 hospitalized, English-speaking, adult patients not currently in SUD treatment with a history of injection drug use and a current infection requiring treatment with IV antibiotics, were prospectively enrolled. Participants were followed weekly during the hospitalization and for 60 days after discharge via interview and medical record review.

Results: Of the 42 participants, 8 (19.0%) accepted discharge to residential SUD treatment, 16 (38.0%) completed at least one follow-up research visit after hospital discharge, and 3 (7.1%) died during the 5-month study period. The majority (33; 78%) were hospitalized with endocarditis, and 37 (88.0%) had an opioid use disorder (DSM-5). Mean days of self-reported IV opioid use in the 30 days before hospitalization compared to 30 days after discharge decreased significantly (16.5 to 1.5, $P = .001$) despite not receiving SUD treatment. Illicit in-hospital drug use was identified in 17 (40.5%) participants, with opioids most commonly detected.

Conclusion: Hospitalization is a 'reachable moment' and critical opportunity to initiate evidence-based treatment for opioid use disorder. The ongoing in-hospital illicit drug use and high short-term mortality observed in this study contribute to the mandate to expand access to effective pharmacotherapy for opioid use disorder and integrate it into health care settings.

1. Introduction

Individuals with substance use disorders (SUD), frequently contact the healthcare system for complications of substance use, including opioid overdose (Hsu, McCarthy, Stevens, & Mukamal, 2017; Rudd, Aleshire, Zibbell, & Gladden, 2016) and injection-related infections (Ronan & Herzig, 2016) that may require weeks of intravenous (IV) antibiotic therapy. These hospitalizations are generally prolonged, costly (Ronan & Herzig, 2016), and focus solely on the infection, often omitting treatment for the underlying, causative SUD (Fanucchi & Lofwall, 2016; Rosenthal, Karchmer, Theisen-Toupal, Castillo, & Rowley, 2016). In addition, there are multiple complex barriers to post-acute care for patients with SUD that contribute to the extended hospital stay and ultimately to the overall cost of care (Wakeman & Rich, 2017).

Hospitalized persons with SUDs may not be initially treatment-seeking (Pollini, O'Toole, Ford, & Bigelow, 2006), but the acute medical illness may be a pivotal "reachable" moment to initiate SUD treatment and link to ongoing care (D'Onofrio, O'Connor, Pantalon, et al., 2015; Liebschutz, Crooks, Herman, et al., 2014; Velez, Nicolaidis, Korthuis, & Englander, 2017). In recent years, a small number of medical centers, predominantly in urban settings, have developed inpatient addiction consultation services to fill this treatment gap (Englander, Weimer, Solotaroff, et al., 2017; Wakeman, Metlay, Chang, Herman, & Rigotti, 2017), but many others have not. Systems of care that integrate evidence-based SUD in general medical settings have significant potential

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to improve patient outcomes and decrease cost. As healthcare organizations take steps to create such programs, additional evidence on baseline SUD prevalence and risk behaviors, motivating factors, and treatment preferences is needed to better inform improvement efforts.

As part of an overall SUD treatment services strategic plan in a large, academic medical center in the heart of the opioid epidemic, this prospective study evaluated the underlying SUD severity, risk behaviors, motivation for treatment, willingness to enter residential SUD treatment, and frequency of in-hospital illicit substance use among hospitalized adults who inject drugs with complex infections requiring IV antibiotics. The goal was to conduct a pilot needs assessment and collect preliminary data to inform larger studies and interventions to improve the care of medically complex patients with SUD.

2. Methods

This is a prospective, observational study of a convenience sample of adults hospitalized with severe infections due to injection drug use (IDU). Participants were prospectively enrolled from March 8, 2016 through August 25, 2016. This study was approved by the University of Kentucky Institutional Review Board.

2.1. Setting and study design

The study took place at a 945-bed academic medical center in Lexington, Kentucky serving as a regional tertiary referral center. At the time of the study, patients hospitalized for complications of IDU typically did not receive a comprehensive assessment for SUD, nor was pharmacotherapy for OUD started in the inpatient setting. There were no specific inpatient protocols for management of OUD in the hospital. In August 2015, UKHealthCare developed a collaborative relationship with a residential SUD treatment facility in London, KY (75 miles from the hospital) to provide SUD treatment and ongoing antibiotic therapy via peripherally-inserted central catheter (PICC) to adults with severe infections from IDU, allowing earlier hospital discharge, as the current practice was to complete IV antibiotics before discharge. There were no other residential SUD treatment facilities closer to Lexington, KY able to accept patients with a PICC. Furthermore, though most residential SUD treatment facilities in KY did not offer pharmacotherapy for opioid use disorder (OUD) (e.g. buprenorphine, methadone, or naltrexone), this site promised to do so.

Participants were assessed as soon as possible upon referral to the study team and weekly until hospital discharge. Thus, there was variability in the duration of in-hospital observation among participants. Participants were asked to attend follow-up research visits at 14, 30 and 60 days after hospital discharge. For participants still in residential treatment, follow-up research visits could be conducted on-site at the residential facility or by phone.

2.2. Participants

Patients were recruited from the hospital medicine and cardiology services with a goal of 50 participants; a target that would provide sufficient preliminary data to inform interventional approaches and be feasible given the pilot funding available. Advertisement was via flyers, in-person, and electronic communication to attending physicians, fellows, advanced practice providers, and case managers of these services. Inclusion criteria were hospitalized, English-speaking, adult patients (18 years of age or older) not currently in SUD treatment, current infection deemed likely due to IDU by the primary medical team and requiring treatment with IV antibiotics, on a non-intensive care medical floor, and providing informed consent. Patients initially admitted to the intensive care unit could be enrolled after medical floor transfer. Incarceration during the hospitalization or pregnancy were exclusionary.

2.3. Data collection

All participants gave written informed consent and were interviewed in their hospital room or, if in a shared room, in a private conference room. Baseline characteristics, including age, race, sex, insurance status, length of stay, primary infection, and administered medications, were determined via review of the electronic medical record. Participants completed an initial comprehensive assessment with several standardized, validated instruments and a locally developed questionnaire about which FDA-approved OUD treatments may be personally helpful for those with OUD. SUD diagnosis and severity were assessed with the Mini International Neuropsychiatric Interview v. 5.0.0 (Sheehan, Lecrubier, Sheehan, et al., 1998) (with an additional measure for craving to assess SUD according to Diagnostic and Statistical Manual (DSM) 5 criteria) and Addiction Severity Index – Lite (McLellan, Kushner, Metzger, et al., 1992; Mclellan, Luborsky, Cacciola, et al., 1985). Self-reported drug use was assessed with a modified Timeline Follow-Back (TLFB) (Sacks, Drake, Williams, Banks, & Herrell, 2003; Sobell, Sobell, Leo, & Cancilla, 1988).

Opioid withdrawal was assessed with the Clinical Opiate Withdrawal Scale (COWS) (Wesson & Ling, 2003), and pain was assessed with the Brief Pain Inventory (Keller et al., 2004). Motivation for SUD treatment was assessed with the Texas Christian University Treatment Needs and Motivation Form (De Weert-Van Oene, Schippers, De Jong, & Schrijvers, 2002; Gryczysnki, Schwartz, O'Grady, & Jaffe, 2009), which includes 36 items from 5 scales representing problem recognition, desire for help, treatment readiness, treatment needs index, and pressures for treatment index; the 5 scale scores range from 10 to 50 (TCU MOT © 2011, TCU Institute of Behavioral Research, Fort Worth, Texas). Self-reported substance use was assessed with TLFB. Illicit drug use (to include illegal drugs with no medical use like heroin, as well as non-prescribed licit drugs) was assessed with urine drug screening (UDS) at each study visit, which qualitatively assessed the presence of benzodiazepines, barbiturates, cocaine, tetrahydrocannabinol, methamphetamine, amphetamine, phencyclidine, opiates, methadone, oxycodone, and buprenorphine using immunoassays (American Screening Corporation, Inc.). All UDS results were done as part of study procedures, and UDS results that may have been done as part of hospital clinical care were not included in the data set. After discharge, self-reported drug use, opioid withdrawal, and motivation for treatment were assessed along with urine toxicology.

2.4. Data analysis

Descriptive statistics were examined for each of the sociodemographic, drug use, and treatment outcomes. Self-reported drug use was analyzed with nonparametric Wilcoxon Signed Rank Tests. Analyses were conducted using SAS 9.3 (SAS Institute, Inc., Cary, NC) for Windows and were considered significant when $P < .05$. Locally developed surveys included both 5-point Likert scale response items as well as open-ended response items, which were grouped into descriptive categories for analysis.

2.4.1. In-hospital illicit drug use

UDS results were analyzed in conjunction with the electronic medication administration record. A conservative approach was taken in determining whether a positive result was classified as illicit drug use. A positive result was classified as illicit if there were no medications administered in the time period before the positive result predicted to cross-react given the expected half-life of the administered drug (generally 7 days preceding the test result, and longer for methadone, buprenorphine, and benzodiazepines with active metabolites). As a positive drug test at the first in-hospital research visit could be attributed to prehospitalization illicit use, positive results were only counted as in-hospital illicit use when the test was positive after an earlier negative result. If patients were receiving oxycodone regularly,