



Research paper

Frequent emergency department presentations among people who inject drugs: A record linkage study

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ABSTRACT

Background: People who inject drugs (PWID) have been described as frequent users of health services such as emergency departments (EDs), however few studies have described demographic factors, patterns of substance use and previous health service use associated with frequent use of EDs in this population.

Methods: Using a combination of self-reported data from a cohort of PWID and administrative ED data obtained through record linkage, we identified longitudinal factors associated with the use of ED services. Bivariate and multivariate analyses were conducted using negative binomial regression to identify exposures associated with both cumulative ED presentations, and logistic regression to identify exposures of frequent ED presentations (defined as three or more annual presentations).

Results: Among 612 PWID, over half (58%) presented to EDs at least once and over a third (36%) presented frequently between January 2008 and June 2013. Frequent and cumulative ED presentations were associated with reporting the main drug of choice as cannabis (AOR: 1.42, 95%CI: 1.07–1.89 and AIRR: 2.96, 95%CI: 1.44–6.07 respectively) or methamphetamine (AOR: 1.62, 95%CI: 1.17–2.2 and AIRR: 2.42, 95%CI: 1.08–5.46 respectively) compared to heroin, and past month use of mental health (AOR: 1.42, 95%CI: 1.08–1.85 and AIRR: 3.32, 95%CI: 1.69–6.53 respectively) and outpatient services (AOR: 1.47, 95%CI: 1.00–2.16 and AIRR: 0.95, 95%CI: 1.52–10.28 respectively).

Conclusion: PWID who are frequent users of EDs are likely to have complex health and substance use-related needs. EDs should actively refer people who present with cannabis and methamphetamine dependence to harm reduction services. Harm reduction services should ensure people referred from EDs are screened for co-occurring mental health conditions and receive adequate support.

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Introduction

Overcrowding at emergency departments (EDs) is a problem documented in Australia and internationally (Dent, Phillips, Chenhall, & McGregor, 2003; Geelhoed & de Klerk, 2012; Zuckerman & Shen, 2004). One reported driver of overcrowding is frequent ED use by population sub-groups with chronic pain and mental health conditions, and those who may have limited access to primary health care (Pines et al., 2011), such as people with substance use issues (Billings & Raven, 2013; Fuda & Immekus, 2006).

Previous reports show people who inject drugs (PWID) frequently use EDs (Aitken et al., 2012; Kerr et al., 2005; Nambiar, Spelman, Stoove, & Dietze, 2017), typically for injecting-related harms, injuries and mental health conditions (Kerr et al., 2005; Marks et al., 2013; Nambiar et al., submitted). While acute events such as drug overdose and trauma typically require ED services, soft-tissue infections and some mental health conditions can be managed in low acuity settings such as primary health care. Delays in attending primary health care at the onset of some medical conditions may result in ED presentations once the condition has festered. However PWID face a range of barriers to accessing primary health care such as out-of-pocket expenses, inconvenient service opening hours and the stigma associated with injecting drug use (Drumm et al., 2003; Islam et al., 2012; Nambiar, Stoove, & Dietze, 2014). These barriers may encourage the use of relatively anonymous and low threshold services, such as those provided in EDs (Chitwood, McBride, French, & Comerford, 1999).

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In a previous study using a cohort of PWID we reported rates of ED utilisation among Australian PWID over three times higher than the general population (Nambiar et al., submitted). This finding was evident despite the availability of free primary health care targeted to PWID that we have shown in a separate study to be widely used by the this cohort (Nambiar et al., 2014). Taken together these findings suggest that there may be sub-populations of PWID whose needs are not met by the targeted primary health care services and may be at greater risk of acute harm and frequent ED presentations. It is therefore important to understand the relationship between use of other health services and ED utilisation, as well as the effect of personal characteristics and patterns of substance use on ED use among PWID to help develop tailored interventions or refine existing targeted services. In the current study we use prospective data from a cohort of PWID to identify longitudinal correlates of cumulative and frequent ED use.

Methods

Study population

The study population is drawn from the Melbourne injecting drug user cohort study (MIX), an ongoing community-based cohort of PWID recruited from urban locations in Melbourne, Australia, between 2008 and 2010. Eligible participants had to be residing in Melbourne, aged 18 years or over, reported injecting heroin or amphetamines regularly (at least once a month in the six months prior to baseline) and were able to present a valid Medicare number (used to access the universal healthcare system in Australia and needed for record linkage). The MIX questionnaire collects information on demographic, drug use, health service use and drug purchasing characteristics. Interviews are conducted annually and participants reimbursed AUD\$30 for their time and expenses. Further study details including detailed baseline characteristics of the cohort are available elsewhere (Horyniak et al., 2013; O'Keefe, Scott, Aitken, & Dietze, 2016).

Data sources for ED presentations

The Victorian Emergency Minimum Dataset (VEMD) contains state-wide administrative and clinical data detailing ED presentations at all Victorian public hospitals with designated EDs. The dataset is managed by the Research Services and Data Integration Unit at the Victorian Department of Health and Human Services (DHHS). Data linkage to VEMD records was conducted by the DHHS using deterministic linkage from January 2008 to June 2013 and a "project ID" linkage key allowed records for ED cases to be matched to cohort self-report data. Deterministic linkage required exact matches on the first eight digits of the Medicare number, first three letters of the patient first name, date of birth and sex. The linkage quality was assessed internally by the DHHS and the false-positive rate was estimated to be less than 5%.

Definitions

Outcome variables

Analyses focussed on identifying fixed and time-varying factors associated with both cumulative and frequent ED presentations, defined below. Cumulative ED use was a discrete measure of the total number of ED presentations between the previous interview and the following interview or between the last interview date and the censor date to identify correlates of an increased rate of ED presentations. As there is no consistent or clinical definition of frequent use of EDs, we defined a priori frequent ED presentations as a cluster of three or more presentations between interviews or between the last interview date and the censor date, used in our

previous work which describes the characteristics of ED presentations in this cohort in detail (Nambiar et al., submitted). All ED presentations between baseline recruitment (November 2008 to March 2010) up to the linkage date (30th June 2013) were included in the analysis. The majority of research describing use of ED services has dichotomised ED use in order to clinically define frequent use (Scott, Strickland, Warner, & Dawson, 2014). The purpose of including both a discrete as well as a dichotomous outcome was to ensure clinical relevance without losing the statistical power of modelling by collapsing a discrete variable into a dichotomous one. Given the limitations of each outcome measure, exposures that were associated with both outcomes (continuous and dichotomous) were of particular interest.

Exposure variables

Gender (male vs female) was the only fixed variable in the model. Time-varying factors included were age (below 25, 25–29, 30 years and above) and education (below year 10, year 10–11, year 12 or higher), employed (yes vs no), and current unstable accommodation (yes vs no). Unstable accommodation included living in a boarding house, squatting or living on the street. Two measures of substance use were used; the AUDIT-C (a validated tool for identifying harmful alcohol consumption; (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998) which was implemented as per Dietze et al. (2013) referring to drinking behaviours in the past month) and current main drug of choice (methamphetamine, heroin, cannabis, other opiates). Self-reported health was measured using the physical and mental components of the Short Form eight quality of life scale (SF-8) (Ware, 2001). As PWID report lower self-perceive health compared to the general population (Millson et al., 2004), the distribution of baseline SF-8 scores in the cohort was used to categorise scores as lower quartile (scores below the 25th percentile), average (scores in the 25th–75th percentile) or upper quartile (scores above the 75th percentile) (Nambiar, Agius, Stoope, Hickman, & Dietze, 2015). Drug treatment was measured based on current prescription of opioid substitution therapy (OST) (yes vs no). Self-reported past month use of hospital outpatient services (yes vs no), past month use of targeted primary health care (PHC) services (yes vs no), past month use of general PHC services (yes vs no) and past month use of mental health services such as psychiatrist or psychologist (yes vs no) were included as indicators of different health service utilisation. Targeted PHC were defined as services provided specifically for PWID, including general practice (GP), sexual health and drug and alcohol services (such services were established by the Victorian Government in areas with known street drug markets in 1999 (McDonald, 2002) while general PHC referred only to GP services.

Statistical methods

We described sample socio-demographics, health service use, drug use and other relevant risk factors at baseline. Correlates of cumulative ED presentations were estimated using negative binomial regression, as initial analysis suggested overdispersion of events (median 0, 90th percentile 1, range 0–38), and reported as incidence rate ratios (IRRs) with 95% confidence intervals (CI). Logistic regression models were used to identify correlates of frequent ED use, with results reported as odds ratios (ORs) and 95% CIs. Statistical significance was assessed at the 10% level for univariable significance and the 5% level for multivariable significance. A complete case approach was adopted so that participants with incomplete data on exposures of interest were excluded.

In both the models, participant ID was used to account for correlations at the individual level and an offset variable (measured in person-years) was used to account for differences in inter-interview intervals that create different 'risk periods' for

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