Research paper

High risk injecting behaviour among people who inject pharmaceutical opioids in Australia

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ABSTRACT

Background: Use of opioid analgesic medicines has doubled globally over the past decade, with a concomitant increase in prevalence of injection of pharmaceutical opioids (PO), including in Australia. This study investigates types of PO injected, methods used to prepare PO for injection and correlates of recent (last 6 months) PO injection among a large national sample of people who inject drugs (PWID).
Methods: The Australian NSP Survey (ANSPS), conducted annually at ∼50 NSP services across Australia, consists of a brief self-administered questionnaire and provision of a capillary dried blood spot for HIV and hepatitis C antibody testing. Data from 2014 were used to conduct univariable and multivariable logistic regression analysis to determine factors independently associated with recent injection of PO.
Results: Among 1488 ANSPS respondents who were identified as opioid injectors, 57% (n = 848) reported injection of PO in the previous six months. The majority of PO injectors (85%) reported filtering PO prior to injection, although use of efficacious wheel filters was relatively rare (11%). Correlates of POs injection included daily injection (AOR = 1.65, 95% CI 1.31–2.08), receptive sharing of syringes (AOR = 2.00, 95% CI 1.43–2.78), receptive sharing of drug preparation equipment (AOR = 1.55, 95% CI 1.19–2.01), drug overdose in the previous year (AOR = 1.81, 95% CI 1.36–2.42) and residence in inner regional (AOR = 3.27, 95% CI 2.21–5.23) or outer regional/remote (AOR = 5.50, 95% CI 3.42–8.84) areas of Australia.
Conclusion: PO injection is geographically widespread among Australian PWID and takes place in the context of poly-drug use. People who inject POs are at high risk of overdose, injection related injury and disease and blood borne viral infections. Harm reduction services that target this group, including in non-urban areas, should deliver health education regarding PO-specific overdose risks, the requirement to adequately filter PO before injection and to ensure that both naloxone and specialist pill filters are readily accessible.

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Introduction

Global use of opioid analgesic medicines has doubled over the past decade, with 96% of use in 2011–2013 occurring in North America, Western and Central Europe and Oceania (Berterame et al., 2016). In keeping with UN Office on Drugs and Crime recommendations (United Nations International Narcotics Control Board, 2011), the Australian Pharmaceutical Benefits Scheme ensures that approved pain relief medicines are readily available to consumers who need them. Notwithstanding, some people intentionally or unintentionally use prescription opioids

(PO) outside prescribed parameters (Australian Government Department of Health and Ageing, 2012). Non-medical use of prescription opioids refers to use without a prescription or use not as directed by a medical professional (Larance, Degenhardt, Lintzeris, Winstock, & Mattick, 2011) and includes the injection of PO that were not prescribed to be administered parenterally.

Recent increases in the prevalence of PO injection have been documented in a number of countries, including Canada (Bruneau, Roy, Arruda, Zang, & Jutras-Aswad, 2012; Fischer, Rehm, Patra, & Cruz, 2006; Roy, Arruda, & Bourgois, 2011), Australia (Degenhardt et al., 2006), and the USA (Havens, Walker, & Leukefeld, 2007; Johnson, Fibbi, Langer, Silva, & Lankenau, 2013). Increased PO use and dependence is also reflected in increased demand for treatment services. Over the decade 2000–2010, the proportion of Australian Needle and Syringe Program (NSP) attendees that

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reported last injecting PO increased fourfold from 4% to 16% (Iversen & Maher, 2015) and among opioid treatment episodes, the proportion where PO were identified as the main drug of concern almost doubled from 19% to 33% (Australian Institute of Health and Welfare, 2012).

PO injection is associated with a number of health-related harms (Lake & Kennedy, 2015). Injection of PO has been found to be associated with increased risk of hepatitis C virus (HCV) infection (Bruneau et al., 2012; Zibbell, Hart-Malloy, Barry, Fan, & Flanigan, 2014) and was implicated in the recent outbreak of HIV infection among people who inject drugs (PWID) that occurred in Scott County, Indiana, US (Conrad et al., 2015; Strathdee & Beyrer, 2015). A recent systematic review of health outcomes associated with injection of PO supported associations between PO injection and HCV sero-positivity, although associations with HIV infection varied according to the type of PO injected (Lake & Kennedy, 2015). PO that are intended for oral administration must be crushed and/or dissolved before they can be injected, processes that increase the risk of skin and soft tissue infections and other adverse health outcomes, including pulmonary embolization (Darke, Duflou, & Torok, 2015; Del Giudice, 2004). Further, deaths attributable to PO use have increased substantially in the US and Canada (King, Fraser, Boikos, Richardson, & Harper, 2014; Okie, 2010) and the majority (70%) of accidental opioid overdose deaths in Australia in 2011 were attributed to opioids other than heroin (Roxburgh & Burns, 2015).

In this study we use data from a large national sero-surveillance project to investigate prevalence of recent PO injection, the range of PO injected and methods used to prepare PO for injection. We also examine factors independently associated with recent PO injection among the sub-population of opioid injectors who attend NSPs in Australia.

Methods

Study population

The Australian NSP Survey (ANSPS) is a cross-sectional survey, conducted annually at ~50 NSP services across Australia. During a one-two week survey period in 2014, all PWID who attended participating NSP services were invited to provide a capillary blood sample and complete a brief self-administered questionnaire covering demographic characteristics and injecting behaviour. Respondents provided verbal consent for voluntary, anonymous, non-reimbursed participation and were eligible to participate in the study only once during the survey period. ANSPS methodology has been described in detail elsewhere (Iversen, Wand, Topp, Kaldor, & Maher, 2013; MacDonald et al., 1997) and previous research indicates that ANSPS samples are representative of the broader population of Australian NSP attendees (Topp et al., 2008). Ethical approval was obtained from the UNSW Australia Human Research Ethics Committee (HREC) and relevant jurisdictional and site-specific HRECs.

Serological testing

Capillary dried blood spots were collected on cotton-fibre blotter using a single use lancet. HIV antibody was detected using the Murex 1.2.0 ELISA (Diasorin), with repeatedly reactive specimens subject to Western blot confirmatory testing (Bio-Rad New LAV blot 1, France). A modified third generation enzyme immunoassay (Monolisa anti-HCV Plus Version 2 EIA, Bio-Rad, France) was used to detect HCV antibodies (anti-HCV). A modified cut-off value for optical density was calculated to capture greater than 95% of the seronegative population. Specimens were considered positive for anti-HCV if the optical density to cut-off ratio was ≥ 1 on initial and subsequent testing.

Study outcome and statistical analysis

The primary outcome for this study was recent (past six months) injection of PO. PO were defined as any opioid analgesics, excluding opioid substitution therapies (methadone, buprenorphine and buprenorphine-naloxone). Respondents were provided with a list of PO most commonly injected in Australia (codeine, fentanyl, morphine, pethidine, hydromorphone, Oxycontin®, Targin®, other oxycondone e.g. Oxynorm®, Endone®) and provided with the opportunity to specify PO not included. Respondents were asked to identify (1) each PO they had injected in the previous six months; (2) the PO they had injected most frequently in the previous six months (main PO); (3) whether they had heated this drug the last time they injected it; (4) whether they had used a filter the last time they had injected this drug and (5) the type of filter used.

Respondents at participating NSP services were classified according to the Australian Bureau of Statistics Australian Statistical Geography Standard (Australian Bureau of Statistics, 2011). This categorical system uses relative access to services to divide Australia into the following regions: Major cities of Australia; Inner Regional Australia; Outer Regional Australia; Remote Australia; Very Remote Australia and Migratory. No participating NSP services were located in 'Very Remote Australia' or 'Migratory' regions. Only one participating NSP service was located in "Remote Australia" and this region was combined with "Outer Regional Australia".

Interquartile ranges were used to define groups for continuous variables (age and age at first injection). Logistic regression models were used to estimate crude and adjusted odds ratios (AOR) and 95% confidence intervals (95% CI) to identify factors associated with recent pharmaceutical opioid injection. All variables associated with the outcome at $p < 0.10$ in bivariate analyses were considered in multiple logistic regression models using a backwards stepwise approach with factors sequentially eliminated according to the result of a likelihood ratio test. All analyses were conducted using STATA software version 12 (Stata Corporation, College Station, TX, USA).

Results

Sample characteristics

In October 2014, 2378 PWID attending NSPs completed the ANSPS and the response rate was 48%. In order to avoid confounding due to inherently different characteristics of sub-populations based on drug type, the sample was restricted to people who were identified as opioid injectors. People who last injected performance and image enhancing drugs (n = 140) or stimulants (n = 576) and where no PO injection had occurred in the previous six months were excluded. Respondents were also excluded if they did not answer the questions on recent PO injection (n = 174). Among the remaining 1488 opioid injectors, two thirds (68%) were men and a minority identified as transgender (0.7%). The majority (81%) identified as heterosexual, were born in Australia (85%) and 14% identified as Indigenous Australian. The median age of respondents was 40 years and respondents first injected drug a median of 20 years prior to survey completion. Heroin was the most commonly reported drug last injected (46%) and more than half (57%) of respondents reported daily or more frequent injection in the month preceding survey completion. One third of respondents (33%) had a previous history of opioid substitution therapy (OST) and 48% were currently engaged in OST.