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Exploring mortality among drug treatment clients: The relationship between treatment type and mortality

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ABSTRACT

Aims: Studies consistently identify substance treatment populations as more likely to die prematurely compared with age-matched general population, with mortality risk higher out-of-treatment than in-treatment. While opioid-using pharmacotherapy cohorts have been studied extensively, less evidence exists regarding effects of other treatment types, and clients in treatment for other drugs. This paper examines mortality during and following treatment across treatment modalities.
Methods: A retrospective seven-year cohort was utilised to examine mortality during and in the two years following treatment among clients from Victoria, Australia, recorded on the Alcohol and Drug Information Service database by linking with National Death Index. 18,686 clients over a 12-month period were included. Crude (CMRs) and standardised mortality rates (SMRs) were analysed in terms of treatment modality, and time in or out of treatment.
Results: Higher risk of premature death was associated with residential withdrawal as the last type of treatment engagement, while mortality following counselling was significantly lower than all other treatment types in the year post-treatment. Both CMRs and SMRs were significantly higher in-treatment than post-treatment.
Conclusion: Better understanding of factors contributing to elevated mortality risk for clients engaged in, and following treatment, is needed to ensure that treatment systems provide optimal outcomes during and after treatment.

1. Introduction

In 2011/12, it is estimated that between 202, 168 and 232, 419 Australians received alcohol and other drug treatment (AOD) (Chalmers, Ritter, & Berends, 2016). Alcohol and other drug treatments take various forms (e.g. pharmacological detoxification, psychosocial interventions) and are delivered through a range of public and private service providers (Chalmers et al., 2016). While supporting evidence varies across modalities, there is widespread agreement that individuals who engage with treatment services are more likely to significantly reduce or cease drug use and remain drug free than those who do not undertake treatment (Corsi, Lehman, & Booth, 2009; Madras et al., 2009; Maremmani, Pani, Pacini, & Perugi, 2007; World Health Organisation, 2008). Drug use cessation is associated with improvements in general health, mental health and social functioning (Corsi et al., 2009; Department of Health (England), 2007; Kimber et al., 2010; Madras et al., 2009). Yet, there is also risk associated with treatment engagement and drug use cessation. Evidence suggests that among opioid, heroin and alcohol treatment attendees in particular, mortality rates peak within the first four weeks following treatment cessation (Buster, Brussel, & Brink, 2002; Cousins et al., 2011; Degenhardt et al., 2009; Strang et al., 2003).

Examination of mortality outcomes for drug users indicates that treatment engagement is protective against premature mortality; that is mortality rates are lower when users are in treatment than prior to or indeed following treatment cessation (Darke, Mills, Ross, & Teesson, 2011; Degenhardt et al., 2009). The period immediately after discharge from residential detoxification (Strang et al., 2003) or following incarceration (Farrell & Marsden, 2008; Ødegård, Amundsen, Kielland, & Kristoffersen, 2010; Seaman, Brettle, & Gore, 1998), has been associated with sharply elevated overdose fatality risk. Indeed, clients whose drugs of choice are central nervous system CNS depressants (alcohol or heroin) prior to entry into detoxification treatment have higher mortality

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risk following treatment, when compared with clients whose primary drugs are stimulants (Saitz et al., 2007). Relapse after detoxification represents a specific risk due to a sharp reduction in tolerance.

Opioid-using cohorts receiving pharmacotherapy are the most extensively studied group in regards to post-treatment mortality. For instance, Degenhardt et al. (2009) found that opioid pharmacotherapy clients had an in-treatment crude mortality rate (CMR) of 6.0 (95% CI: 5.7–6.4) per 1000 PY compared with an out-of-treatment rate of 11.5 (95% CI: 11.1–12.0) per 1000 PY. Similarly, Ledberg (2017) reported mortality rates in a sample of opiate users undergoing methadone maintenance treatment was significantly increased compared to the general population, both during periods of treatment and when not in treatment. While mortality risk is higher among opioid pharmacotherapy clients in the first two to four weeks following treatment cessation (Clausen, Anchersen, & Waal, 2008; Cousins et al., 2011; Degenhardt et al., 2009) the initial four weeks of pharmacotherapy induction is also a time of elevated risk compared with remaining time in treatment. Similar patterns of elevated mortality risk immediately following treatment cessation have been noted in other drug using cohorts.

In a cohort study of over 10,000 heroin users, mortality was measured across multiple treatment modalities, including methadone maintenance, therapeutic communities, pharmacological detoxification and treatment, and psychosocial treatments, finding most deaths occurred out of treatment, with the highest rate of death occurring in the first month out of treatment (Davoli et al., 2007). Similarly, when the effect of medication-free inpatient treatment (detoxification) was assessed among a Norwegian group of drug users followed for eight years after treatment cessation, elevated risk of death was experienced in the first month following treatment discharge (Ravndal & Amundsen, 2010).

For clients seeking treatment for alcohol use problems, both short- and long-term mortality risks have been identified following treatment cessation (Costello, 2006; Lloyd, Barratt, Ferris, Best, & Lubman, 2013; Saitz et al., 2007). Acute alcohol-related contributors to causes of death (e.g. overdose and fatal injuries) influence short-term survival following treatment, while chronic conditions (e.g. cancers and liver disease) contribute significantly to increased mortality rates among clients followed up over longer periods (Costello, 2006). Ongoing engagement with support services, and identification of groups at elevated risk have been identified as important to reduce post-treatment mortality for such populations (Costello, 2006; Timko, DeBenedetti, Moos, & Moos, 2006).

While opioid-using cohorts receiving pharmacotherapy have been studied extensively, there is less evidence about mortality risks during and following other types of treatment and for groups of clients in treatment with drugs of concern (DoCs) other than opioids. This study examines mortality outcomes for clients engaged in treatment for alcohol, opioids and other drugs across a range of treatment modalities other than primary pharmacotherapy, and assesses mortality both during treatment and for the 2 years following discharge. Concerns about safety of treatment can compromise acceptance of treatment in the community and discourage engagement by drug users. By identifying periods of elevated risk, when heightened support may be required, associated with different types of drug and alcohol treatment the results of this study can inform safer clinical practices.

2. Methods

This study integrates client data from the Australian Alcohol and Drug Information System (ADIS) database (including detailed information regarding all specialist treatment) with the National Death Index (NDI; which includes detailed information regarding cause of death for all deaths occurring in Australia) to examine mortality outcomes among a cohort of Alcohol and other drug treatment service clients from Victoria, Australia. The two databases were linked based on partial client identifiers.

2.1. Cohort

ADIS is a register of government-funded, specialist alcohol and other drug (AOD) treatment services (for a full list of services please see Table 1). The cohort used for the current study were selected based on three criteria: completion of one or more courses of AOD treatment (for example, counselling, residential withdrawal) in the 12-month period between 1 July 2000 and 30 June 2001, with first course of treatment (COT) starting on or after 1 January 2000; records had to include a valid date of birth (required for linkage purposes) and; records had to include a start date of first COT. After applying these criteria the final cohort included 18,686 clients. To enable data linkage, a unique identifier was created for each individual by combining partial name identifiers (second two letters of first name and first two letters and last letter of surname), date of birth and gender (for example John Doe, 17/01/1969, male would be ohdoe170169m).

2.2. Data sources

2.2.1. ADIS

To ensure full capture of sequential, overlapping and/or embedded COTs we matched cohort codes across eight years of ADIS data. This data captured all COTs that terminated between 1 July 2000 and 30 June 2008. Multiple COTs were common among the cohort with the median of 2 (IQR 1–5) COTs. COTs could be continuous, indicating a change of treatment type, agency or DoC.

The total number of COTs for this cohort was 89,764. A number of steps were taken to clean and prepare the data for analyses. COTs were excluded if they started before 1 January 2000 or after 1 January 2007 and overlapping COTs and consecutive COTs were recoded. Specifically, overlapping courses of treatment were amended so that the first one finished on the day the subsequent one started; both records were retained. Where two or more treatments started on the same day the longest running treatment remained for the analysis and the other treatments were removed. Data cleaning resulted in the removal of approximately 15% of records; a total of 76,342 COTs were retained for the final analysis.

2.2.2. National Death Index (NDI)

Data linkage, between the ADIS cohort and NDI, was conducted by the Australian Institute of Health and Welfare (AIHW). The first of three linkage passes used an exact match unique identifier. This process was repeated matching only on month and year of birth. The final pass identified cases within ADIS where the client was recorded as deceased where death occurred after the last ADIS contact date.

Ninety-four percent of deaths (N = 532) were matched with NDI during the first pass; 10 cases (2%) were matched in the second pass; the final 23 (4%) cases were matched in the third pass.

2.3. Data analysis

Data were examined using survival analysis. All analyses were conducted using Stata 11.

2.3.1. Predictor variables

Demographic, drug and treatment variables available in ADIS were included as predictors in survival time analysis. Sex, country of birth (born in Australia or not) and indigenous status were included as time constant predictors. Age, employment status (employed or not employed), living status (alone or with family/others), temporary or homeless accommodation status, and current involvement in the justice system (through community based orders, parole, bail, custody, etc.) were included as time-varying covariates. Other covariates in the models included primary DoC and injecting drug use at the start of each COT and medical and psychiatric comorbidities.