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Research paper

The impact of cocaine use in patients enrolled in opioid agonist therapy in Ontario, Canada

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ABSTRACT

Background: Opioid agonist therapy is the gold standard of care for opioid use disorder; however, the efficacy of this treatment may be hindered by concurrent drug use, including the use of cocaine. This study examines the impact of cocaine use on treatment retention, while accounting for various risk factors, including geographic location, age, gender, and first-month cocaine use.
Methods: We conducted a retrospective cohort study using anonymized electronic medical records from 58 opioid agonist therapy clinics in Ontario between 2011 and 2013. One-year treatment retention was the primary outcome of interest and was measured by differing frequencies of cocaine use – as well as baseline use – with an additional focus on geographic location (Northern Ontario vs. Southern Ontario).
Results: Our cohort consisted of 3835 patients, with the average retention rate of 44%. Baseline cocaine users had a retention rate of 39% and non-users had a retention rate of 46%. Patients who were cocaine-negative on admission benefited from an increased median days retained (302 vs. 212 days). Patients who used cocaine at higher frequencies had decreased retention rates compared to those who used less often. Despite increased levels of cocaine use, Northern patients were better retained than Southern patients.
Conclusion: Northern patients and patients from urban communities are more likely to be baseline cocaine users. Both baseline and continued cocaine use is predictive of treatment dropout in Northern and Southern patients. The higher the frequency of cocaine use, the more likely a patient is to terminate treatment. Patients in Northern Ontario are retained in treatment at higher rates than their Southern counterparts.

Introduction

Opioids are a family of semi-synthetic molecules that have a pharmacologically similar effect to morphine. Morphine is derived from opium, which is a naturally existing pain reliever. Opioids are among some of the most commonly prescribed medications in Canada, and prescribing rates continue to rise (Dhalla et al., 2009). Opioids have a high incidence of dependence, with approximately 200,000 Canadians dependent on prescription opioids (Webster, 2012). Specifically in Ontario, prescription opioid related deaths increased by 242% between the years of 1991 and 2010 (Gomes et al., 2014).

In remote communities – including many communities in Northern Ontario – the opioid crisis is particularly rampant (Kiepek et al., 2012). Northern Ontario communities experience some of the highest rates of opioid prescribing and opioid related death in the province (Gomes et al., 2011). Due to the vast geography of the North, these communities face numerous barriers when accessing healthcare services. The vast geographic landscape – paired with the chronic shortage of physicians (Strasser & Lanphear, 2008) – results in many Northern Ontario-specific health disparities. Northern Ontario residents suffer from lower life expectancy, increased rates of smoking, obesity, premature avoidable death (Health Quality Ontario, 2014) and diabetes (Booth et al., 2012). The barriers to accessing healthcare services are only

Abbreviations: LHIN, Local Health Integration Network; OAT, opioid agonist therapy; OATC, Ontario Addiction Treatment Centres.

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worsened for patients with opioid use disorder, including when these patients seek treatment.

For those who become opioid dependent, there is a treatment known as opioid agonist therapy (OAT), a maintenance therapy whereby the patient is relieved of their opioid withdrawal by taking either methadone or buprenorphine. Once stabilized on their medication, patients are able to return to their previous social, psychological, and physical functioning. Patients in OAT experience better treatment outcomes when they are retained in treatment for at least one year (Proctor et al., 2015; Rawson et al., 2002). There is considerable evidence to support that longer retention is strongly correlated with a variety of positive health outcomes, including improved physical and mental health, and reduced rates of drug use, relapse, hospitalization, mortality, and illegal activity (Nosyk, Marsh, Sun, Schechter, & Anis, 2010; Peles, Linzy, Kreek, & Adelson, 2008). There are currently over 42,000 patients receiving OAT in Ontario (CPSO, 2015). Given the additional barriers that Northern patients face, it is of great importance that OAT outcomes and factors relating to its success and failure be studied in this geographic context, to better understand how treatment can be tailored for these patients. Currently, factors that relate to OAT and its success in Northern Ontario are not well studied.

We have previously shown that patients receiving OAT in Northern Ontario are retained in treatment at higher rates than patients in Southern Ontario (Eibl et al., 2015); however, the factors that contribute to this difference are not well defined. We hypothesize that Northern patients have better treatment outcomes due to decreased access to other substances – such as cocaine – while in treatment.

Although OAT has been shown to be a very cost effective form of treatment, its efficacy may be negatively impacted by concurrent drug use, including the use of cocaine. Cocaine is a stimulant that alters the brain's ability to regulate dopamine. By inhibiting dopamine reuptake, cocaine causes a dopamine accumulation at the synapse (NIDA, 2010). This increase in dopamine is typically associated with a temporary increase in energy, alertness, and mood (Boys, Marsden, & Strang, 2001). While cocaine use has been shown to increase cognitive function immediately after use, sustained long-term use appears to impair cognitive function (Spronk, van Wel, Ramaekers, & Verkes, 2013). Currently, there is no pharmacological treatment for cocaine use disorder (Dutra et al., 2008; Tzilos, Rhodes, Ledgerwood, & Greenwald, 2009), and current guidelines are limited to the use of cognitive behavioral therapy (CBT) and contingency management (Epstein, Hawkins, Covi, Umbricht, & Preston, 2003; Rawson et al., 2002; Tzilos et al., 2009). However, research surrounding the efficacy of CBT and contingency management for cocaine use disorder in OAT is inconclusive (Darker et al., 2012; Penberthy, Ait-Daoud, Vaughan, & Fanning, 2010; Tzilos et al., 2009).

Studies have found that cocaine use is quite common in patients in OAT, with as many as 30–50% of patients self-reporting cocaine use at treatment initiation (Cone, 2012; Raffa et al., 2007; Roux et al., 2016). The prevalence of cocaine use in OAT is of great concern given that studies have found regular cocaine use to be predictive of poorer treatment outcomes. Specifically, cocaine-using patients tend to suffer from psychological distress (Roux et al., 2016), have a higher risk profile for HIV (Grella, Anglin, & Wugalter, 1995), are more likely to use heroin (Hartel et al., 1995), and are at increased risk of treatment dropout (Brands et al., 2008; Proctor et al., 2015; Salamina et al., 2010; Sullivan et al., 2010). Additionally, a retrospective cohort study in the U.S. found that patients who regularly use cocaine while on OAT are at increased risk of overdose, with as many as one third of opioid related deaths involving cocaine (Visconti, Santos, Lemos, Burke, & Coffin, 2015).

While the impact of cocaine use on OAT retention is well studied, research has yet to be done specific to Northern Ontario, which is home to a unique demographic that is faced with a variety of healthcare disparities. Northern Ontario comprises approximately 90% of Ontario's landmass, yet contains less than 10% of the population. Due to the vast geographic landscape, Northern Ontario communities are often isolated from large urban centers. Because of this, these remote communities often face several barriers when accessing healthcare, especially when seeking OAT. A retrospective cohort study of patients seeking OAT in Northern Ontario found that more than half of patients residing in Northern rural communities lived 127 km or more from their addiction care provider, compared to only 16 km for their Southern urban counterparts (Eibl et al., 2015). It is for these reasons that more research must be done to address healthcare barriers in the North, given that this is a unique and complex patient population. In this study, we investigate the impact of cocaine use on OAT retention, while accounting for various risk factors, including geographic location (North vs. South, and rural vs. urban), age, gender, and first-month cocaine use.

Methods

Clinical context

In Ontario, OAT is regulated by formal treatment guidelines established by the College of Physicians and Surgeons of Ontario (CPSO), which set out expectations with respect to physician practice and are enforced through peer-audits (CPSO, 2011). These guidelines are in addition to the federal requirement for an exemption to prescribe methadone. Variability of practice within the guidelines is possible, but is generally limited. Ontario has a single payer healthcare system, whereby all residents have equal access to OAT through the Ontario Health Insurance Plan (OHIP).

This study is based on the electronic medical records of patients treated within the Ontario Addiction Treatment Centres (OATC), a network of 58 OAT clinics across the province that are operated under common management. Standardized evidence-based best practice policies and operating procedures are in place within the clinic network, which further limit the likelihood of variability of treatment between sites and between physicians. To maintain consistency, patients are typically seen by the same physician throughout the course of their treatment.

Cohort definition

We conducted a retrospective cohort study of patients initiating OAT within OATC for the first time between January 1st, 2011 and June 17th, 2012 in the Province of Ontario. We defined first time OAT as no previous history of methadone or buprenorphine use in the OATC network, based on review of records dating back to 1999. Patients were started on either methadone or buprenorphine/naloxone (the only two medications approved for this purpose in Canada at the time of the study) and were allowed to transition between these medications over the course of treatment. Patients were at least 15 years or older (patients $<$18 years of age accounted for $<$1% of cohort), and were residents of Ontario. All patients were followed from the date of OAT initiation to the date of medication discontinuation, or end of the study period (June 2013). Drug discontinuation was defined as a patient not receiving a dose of methadone or buprenorphine/naloxone for 30 consecutive days.