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Identifying mortality risks in patients with opioid use disorder using brief screening assessment: Secondary mental health clinical records analysis

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ABSTRACT

Background: Risk assessments are widely used, but their ability to predict outcomes in opioid use disorder (OUD) treatment remains unclear. Therefore, the aim was to investigate if addiction-specific brief risk screening is effective in identifying high mortality risk groups and if subsequent clinical actions following risk assessment impacts on mortality levels.

Methods: Opioid use disorder (OUD) patients were identified in the South London and Maudsley Case Register. Deaths were identified through database linkage to the national mortality dataset. Cox and competing-risk regression were used to model associations between brief risk assessment domains and all-cause and overdose mortality in 4488 OUD patients, with up-to 6-year follow-up time where 227 deaths were registered. Data were stratified by admission to general mental health services.

Results: All-cause mortality was significantly associated with unsafe injecting (HR 1.53, 95% CI 1.10–2.11) and clinically appraised likelihood of accidental overdose (HR 1.48, 95% CI 1.00–2.19). Overdose-mortality was significantly associated with unsafe injecting (SHR 2.52, 95% CI 1.11–5.70) and clinically appraised suicidality (SHR 2.89, 95% CI 1.38–6.03). Suicidality was associated with a twofold increase in mortality risk among OUD patients who were not admitted to mental health services within 2 months of their risk assessment (HR 2.03, 95% CI 1.67–3.24).

Conclusions: Diagnosis-specific brief risk screening can identify OUD patient subgroups at increased risk of all-cause and overdose mortality. OUD patients, where suicidality is evident, who are not admitted into services are particularly vulnerable.

1. Introduction

People dependent on heroin or other opioids are up to 14 times more likely to die than their peers (Darke and Ross, 2002). Worldwide, an estimated 69,000 people die from opioid overdose (accidental or deliberate) each year (World Health Organisation (WHO), 2014). In England and Wales, more than 1700 deaths registered in 2014 (53% of all deaths from drug poisoning) involved an opiate drug (Office For National Statistics (ONS), 2015). Assessing and managing risks is a paramount element of care planning and treatment provision to people with drug dependence, particularly in opioid dependence (Department of Health (DOH), 2007). Assessment of risks within the addictions services should be substance misuse specific, prioritizing directly related risks such as overdose, poly-drug use, suicide and/or unsafe injecting practices (National Treatment Agency for Substance Misuse (NTA), 2006a,b).

The effectiveness of risk assessment tools in predicting mortality in mental healthcare is unclear. Wand, 2012 reported inability to conduct a systematic review due to paucity of studies evaluating the effectiveness of risk assessments, and found little evidence to conclude whether risk assessments are effective in relation to self-harm or suicide reduction. Studies attempting to identify individuals who are likely to die by suicide have been largely unsuccessful primarily due to its low prevalence, even within high-risk

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groups (Harriss and Hawton, 2005; Kapur, 2005). A recent study of people receiving secondary mental healthcare reported that the level of clinically appraised risk of self-neglect (but not suicide or violence) predicted all-cause mortality, but the study did not stratify results by diagnosis or examined cause-specific mortality (Wu et al., 2012). Given the differences in aetiology, symptoms, care provision and risk factors between mental health diagnostic groups, it is important to investigate these separately as advised by the NTA (2006a). Therefore, the aim of the current study was to determine if addiction-specific brief risk assessment completed for opioid use disorder patients is effective in predicting risks of all-cause and overdose mortality; to investigate mortality levels in patients clinically appraised as displaying suicidality, increased likelihood of accidental overdose and unsafe injecting practices; and to determine if associations between clinically appraised risks and mortality differs depending on subsequent clinical actions such as admission to secondary mental health services and the type of opioid substitution therapy (OST) prescribed.

2. Methods

2.1. Study setting

South London and Maudsley NHS Foundation Trust (SLaM) is one of the largest secondary mental healthcare services in Europe, currently providing comprehensive mental healthcare and addiction service to a catchment population of approximately 1.2 million residents across seven ethnically and socially diverse, high population density boroughs of south London. SLaM addiction services have used electronic health records (EHRs) since April 2008. In the same year, at the SLaM NIHR Biomedical Research Centre for Mental Health, the Clinical Record Interactive Search (CRIS) was developed. CRIS uses EHRs in a de-identified format, allowing researchers to search and retrieve complete case records for analytical purposes. There are currently more than 260,000 patients represented on the system. CRIS was approved as a dataset for secondary analysis by Oxfordshire Research Ethics Committee C (reference 08/H0606/71+5), and its protocol is described in detail elsewhere (Perera et al., 2016; Stewart et al., 2009).

2.2. Inclusion criteria

Diagnoses in SLaM are coded in accordance with the 10th edition of the World Health Organization International Classification of Diseases (ICD-10; WHO, 1993). This study cohort comprised SLaM patients who were diagnosed with an ICD-10 F11 primary or secondary opioid use disorder (OUD) between 1st April, 2008 to 31st March, 2014 (inclusive), and who had at least one item completed on the Brief Risk Scale Assessment—Addiction (BRSA-A) during the observation period. Diagnoses were derived from their designated SLAM EHR structured fields and from free-text fields using Natural Language Processing (NLP). The NLP application for 'diagnosis' sought to extract any text strings associated with a diagnosis statement in order to supplement the existing structured fields. The performance of the 'diagnosis' NLP application was evaluated formally elsewhere (Sultana et al., 2014). In the SLaM case register, OUD is the second most frequently diagnosed substance use disorder after alcohol use dependence (Hayes et al., 2011).

2.3. Main outcome measures

2.3.1. All-cause mortality. The main outcome in this study was all-cause mortality in individuals with primary or secondary diagnosis of OUD, within the period 1st April, 2008 to 31st March, 2014. Every death in the UK is reported to the Office for National Statistics General Records Office, which is then conveyed to the NHS Care Records Service and available to all NHS organisations. Majority of deaths are registered with ONS within five days and SLaM mortality updates are performed on a monthly basis. This allowed us to establish deaths within the observation period, for both active and inactive SLaM patients. The full procedure for identifying and confirming SLaM patient deaths has been described elsewhere (Chang et al., 2010).

2.3.2. Cause-specific mortality. Additionally, 68.7% of all those who died had death certificate information. This information allowed us to establish cause-specific mortality, and more specifically coding for overdose mortality. Fatal overdoses included a combination of both intentional (i.e., suicide) and unintentional (i.e., drug poisoning) overdose deaths, with ICD-10 codes X409-X450, Y120, Y125 and F119 sub-classified as such. The relationship between heroin overdose and suicide is problematic due to ambiguous circumstantial information and unclear intent (Cantor et al., 2001), therefore for these analyses, we grouped suicide by overdose and fatal drug poisonings into one group. The cause of death information is based on a static ONS-CRIS data linkage and is more likely to reflect a proportion of delayed as well as recent occurrences of deaths within the ONS (ONS, 2011), resulting in the 31% missing causes of death in our cohort.

2.4. Exposures

The main exposures of interest in this study were patients' risks of suicidality, likelihood of overdose and injecting practices. These three risk domains were recorded using the Addiction Brief Risk Scale Assessment (BRSA-A) (described below) in patients with OUD

In addition to the main exposures of interest, a number of other covariates were considered as potential confounders. Patients' risks associated with violence, health, social variables, and service use were also recorded on the BRSA-A. Ethnicity and gender are routinely recorded on SLaM electronic patient records in their designated fields. Age was calculated on the date on which individuals received their first BRSA-A assessment within the observation period. Ethnic group classifications were condensed to "White British", "Other White background", "African, Caribbean and other black background", and "Mixed, unknown and other". Area-level deprivation was established by linking the patient's residential postcode to the UK Census data projected for 2007 in lower super output area units. The full procedure for measuring level of deprivation is described elsewhere (Hayes et al., 2012). Homelessness variable was established by merging information from area-level deprivation and homelessness/unstable housing item on the BRSA-A scale. Information on patient admissions to a SLaM secondary mental health service in the two-month period after BRSA-A assessment was also extracted. This information included general admissions to SLaM, and information on prescription of opioid substitute treatment (OST) medication (i.e., buprenorphine, methadone, Suboxone [buprenorphine/naloxone]) in the 2-month period after BRSA-A completion. Information extracted included both inpatient and outpatient community service admissions/prescriptions in a 60-day (two months) observation period after the BRSA-A completion.

2.5. Risk assessment instrument

The BRSA-A is a compulsory target for the addictions clinical team on all active cases. This risk measure was developed by SLaM clinicians to encourage identification and formal recording of risk areas specific to substance misuse patients; these are then used in their care planning. BRSA-A should be completed for each service user at the point of referral, as part of the service user's initial assessment when he/she first comes into contact with SLaM ser-