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Research paper

Individual and area-level risk factors for suicidal ideation and attempt in people with severe depression

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ABSTRACT

Introduction: Previous research has identified several risk factors that are strongly associated with suicidal behavior in patients with severe depression. However, the effects of area-level characteristics on suicidal ideation and attempt in this population remain unclear.
Methods: The Clinical Record Interactive Search (CRIS) database was used to identify 2587 patients with severe depression who received secondary mental health services from the Camden & Islington NHS Foundation Trust. Stepwise multivariable logistic regression models were used to examine associations between socio-demographic characteristics, clinical variables, area-level measures, and suicidal ideation and attempt as separate outcomes.
Results: Both suicidal ideation and attempts were common among this cohort of severely depressed individuals (70.5% and 37.7%, respectively). While several individual socio-demographic and clinical characteristics were associated with both outcomes, particularly past psychiatric admission (suicidal ideation: adjusted OR=2.86, 95% CI: 2.26–3.62; suicide attempt: adjusted OR=4.00, 95% CI: 3.30–4.89), neither social deprivation nor ethnic density (measured at the area-level) was associated with risk for either outcome.
Limitations: Data were not collected specifically for research purposes and hence information on some potential confounders was not available. Additionally, information was restricted to individuals who accessed secondary mental health services in a defined catchment area and period. The study therefore does not take into account individuals who did not access mental health services.
Conclusions: The variation in risk for suicidal ideation and attempt among severely depressed individuals is explained by differences in individual socio-demographic and clinical characteristics, most notably past psychiatric admission and substance misuse, and not by area-level measures.

1. Introduction

Suicidal behavior exists on a continuum, ranging from suicidal thoughts and attempts to death by suicide. Suicide is one of the leading causes of death worldwide, accounting for about 800,000 deaths each year (World Health Organization, 2014) with about 150 million people attempting suicide globally. In the UK, non-fatal suicide attempts appear to be very common, with 140,000 documented episodes per year (Office of National Statistics, 2014).

One of the major precursors of suicide and suicidal behavior is having a psychiatric disorder, particularly severe depression (Hawton and van Heeringen, 2009). The lifetime risk of suicide attempt among individuals with severe depression is estimated to be 16–40% (Oquendo et al., 2006) as compared with 2.7% in the general population (Nock et al., 2008). The presence and severity of symptoms of depression are strongly associated with attempted suicide. Specifically, the risk of suicide attempts among patients with severe depression is eight times greater during a major depressive episode compared to a full remission period (Sokero et al., 2005). Suicidal ideation is also extremely prevalent among individuals with severe depression and seems to be one of the preconditions for suicide attempts (Sokero et al., 2003).

The risk for suicidal behavior is multifactorial. Several studies have examined individual-level risk factors for suicidal behavior, mainly suicide attempts, in people with severe depression. Risk factors strongly associated with suicide attempts in this population include male sex (Ruengorn et al., 2012), younger age (Bolton et al., 2010; Holma et al., 2010; Sokero et al., 2003), comorbid psychiatric disorders (Bolton et al., 2010), negative life events

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(Chan et al., 2011), being unmarried (Bolton et al., 2010; Holma et al., 2010), having lower income (Bolton et al., 2010) and poor social support (Holma et al., 2010; Sokero et al., 2003).

In addition to focusing on individual risk factors, research on suicide in the general population has also examined characteristics of the environment of individuals that relate to suicidal behavior. These studies examined area-level indicators of deprivation and found higher rates of death by suicide in deprived areas (Kennedy et al., 1999; Rehkopf and Buka, 2006). High levels of deprivation are associated with unhealthy lifestyles, impaired quality of life, high rates of disability and physical illness, decreased life expectancy, poor educational attainment, poor living conditions, and high levels of crime and violence (Social Exclusion Unit, 2004). British ecological data suggest that area-level factors are important: between 1981 and 1991 the greatest increases in suicide rates were in areas of increasing deprivation over that period (Whitley et al., 1999). However, at an individual level, a 5-year record linkage study in Northern Ireland showed that differences in the rates of suicide across different areas were mainly due to the individual characteristics of the population rather than the differences in area-level indicators (O'Reilly et al., 2008). Further UK evidence suggests that after adjusting for individual factors, there was no association between risk of self-harm repetition and area-level indicators of deprivation (Johnston et al., 2006). Analysis of Danish registry data confirms this, showing that the risk for suicide in individuals living in poorer areas was greatly reduced after controlling for the individual-level differences (Agerbo et al., 2007).

To date, many studies have explored the epidemiology of suicidal behavior in people with severe depression but without separating out individual and area-level influences. A review of suicidal behavior in major depressive disorder (Oquendo et al., 2006) concluded that while an array of predictive indicators for suicidal acts has been identified, future studies must assess a comprehensive set of putative risk factors and examine their relative importance in predicting risk. There is a need for a broader understanding of the contribution of individual and area-level characteristics, so that an appropriate balance of suicide prevention strategies can be developed. The present study seeks to examine the association between individual socio-demographic and clinical characteristics and area-level measures (social deprivation and ethnic density) on suicidal ideation and suicide attempt in severely depressed individuals, using routinely collected electronic health records from the Camden and Islington NHS Foundation Trust (C&I NHS FT).

2. Methods

Data for this study were obtained from C&I NHS FT using the Clinical Record Interactive Search (CRIS) tool. CRIS is an application developed to enable routinely collected electronic health records to be used in research, using an explicit de-identification process (Fernandes et al., 2013). C&I NHS FT is a large mental health provider serving a geographic catchment area of two inner-city London boroughs, and approximately 440,000 residents. The database contains full but anonymized information from over 100,000 mental health service users. Studies using CRIS received ethical approval from the NRES Committee East of England - Cambridge Central (14/EE/0177).

2.1. Sample

Using the C&I database, a cohort of 4197 individuals meeting the following criteria were identified:

- Presentation to secondary mental health services at C&I NHS FT between 2008–2014
- Primary diagnosis of severe depressive episode (ICD-10 F32.1, F32.2, F32.3) or recurrent severe depressive episode (F33.1, F33.2, F33.3)

From this sample, 363 patients who had a past or concurrent primary diagnosis of Non Affective psychotic disorders (ICD-10 F20-F29) were excluded from the study, as psychotic disorders are strongly associated with risk of suicidal behavior (Palmer et al., 2005). An additional 1247 patients were excluded due to missing data. Thus, the final analytic sample included 2587 patients. Rates of both suicidal ideation and suicide attempt were higher in those with complete data *vs.* those excluded for missing data (ideation: 70.5% *vs.* 63.4%, respectively, $p < 0.001$; attempts: 37.7% *vs.* 31.9%, respectively, $p < 0.001$), suggesting that suicidal behavior was not underrepresented in the analytic sample.

2.2. Measures

2.2.1. Outcomes – suicidal ideation and attempt

Data on lifetime suicidal ideation and attempt was drawn from two clinical sources: the Health of the Nation Outcome Scales (HoNOS) and the risk assessment. HoNOS is a validated instrument (Wing et al., 1998) used by professionals to assess health and functioning in individuals with mental health problems. It comprises 12 items that assess domains such as psychiatric symptoms, alcohol/drug use and social functioning. Every item is rated on a Likert-style scale, ranging from 0 (no problem) to 4 (severe problem). The HoNOS contain an item assessing non-accidental self-injury, with separate ratings for suicidal ideation and attempt.

The C&I NHS FT risk assessment is an electronic form used to gather information on the presence or absence of any historical or current risk factors that might predict adverse outcomes among patients that are in contact with secondary mental health services. It is a structured assessment that takes the form of tick-boxes recording specific risk factors such as suicidal ideation, self-neglect or thoughts of violence (Wu et al., 2012). This study made use of the items recording suicidal ideation and attempt.

2.2.2. Individual and area-level exposures

Individual-level demographic variables, including sex, age, ethnicity and marital status, were extracted from structured fields within CRIS. Similarly, previous psychiatric admissions were extracted from inpatient records, to derive a binary variable. Additional clinical variables were extracted from the HoNOS, including lifetime substance misuse (problem drinking or drug-taking), physical illness or disability, and psychotic symptoms (the existence of hallucinations/delusions). All HoNOS items were dichotomized to indicate the presence or absence of the condition/symptom.

The Index of Multiple Deprivation (IMD) was used to estimate area-level social deprivation. The IMD combines information from 38 distinct indicators into seven separate domains of deprivation (income; employment; health and disability; education, skills and training; barriers to housing and services; living environment and crime) to create an individual score of deprivation for each area. The measure of deprivation derived is a relative ranking of the 32,482 Lower Super Output Areas in England (LSOAs), with higher scores indicating higher levels of deprivation. These LSOAs characteristically have an average population of 1500 people (about 400 households) (Department of Communities and Local Government, 2011). Based on IMD scores of 326 local authorities in England, Camden is the 74th and Islington is the 14th most deprived local authority. Both boroughs have heterogeneous levels of social deprivation with scores ranging from 7.7 to 51.2 in Camden