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Short communication

Predictors of suicide attempts after violent offences in schizophrenia spectrum disorders

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ABSTRACT

The aim of this survey was to identify predictors of suicide attempts that immediately followed a violent crime in patients with schizophrenia. Documentations of patients diagnosed with schizophrenia and released in a 10 years period from the National Institute of Forensic Psychiatry were reviewed. Twenty-six out of 223 patients attempted suicide after the violent crime. The young age of the victim, and living in partnership were those factors differentiating suicidal violent offenders from their non-suicidal counterparts.

1. Introduction

Of the major psychoses, schizophrenia has the highest risk for violent crime (Mullen, 2006). Approximately 5–10% of homicides are committed by patients suffering from schizophrenia (Eronen et al., 1996; Wallace et al., 1998; Erb et al., 2001; Schanda et al., 2004) and the risks for committing murder or a non-fatal violent crime in this population are 1:10,000 and 1:150, respectively (Wallace et al., 2004). A history of violence and current alcohol use appear to be the main risk factors for violent behaviour (Walsh et al., 2004). Men and women diagnosed with schizophrenia have an equal risk of committing a non-violent crime (Hodgins et al., 2008), but men have a slightly elevated risk of committing a violent crime (Robbins et al., 2003; Vevera et al., 2005).

Aggression can be directed inwards, leading to suicide attempts or suicide. A comprehensive review estimated the lifetime risk of death by suicide at 4.9% for people with schizophrenia (Palmer et al., 2005). As a reference, the suicide rate in Hungary was 26/100.000/year in 2005 (Rihmer et al., 2013). Another systematic review of the risk factors for suicide in schizophrenia found that many of the important factors were similar to those in the general population, including co-morbid mood disorder, recent loss, previous suicide attempts, and illicit drug use. Further factors such as fear of mental disintegration, agitation or restlessness, and poor adherence to treatment are not immediately self-evident (Hawton et al., 2005). Another recent systematic review found that the factors most strongly associated with suicide in schizophrenia were young age and male sex, and a high level of education. Illness-related factors including depressive symptoms, history of suicide attempts, ongoing hallucinations and delusions, insight, and co-morbid medical conditions were also important predictors. A family history of suicide and co-morbid alcohol and drug use were factors strongly associated with suicide. Adequate treatment for schizophrenia and related comorbid disorders was the only protective factor identified (Hor and Taylor, 2010).

The CATIE (Clinical Antipsychotic Trials of Intervention Effectiveness) study compared the effectiveness and tolerability of first versus second generation antipsychotics in a multi-phase randomized controlled trial (Stroup and Lieberman, 2010). The sample was collected between January 2001 and December 2004 and comprised 1460 men and women diagnosed with schizophrenia. Later, in a longitudinal analysis of two secondary outcome data of the CATIE study, violence and suicidality, a strong association was found between them in both sexes (In univariate analyses, two suicidality factors were significantly associated with violence in men: suicidal threats (HR = 3.8, 95% CI 2.4–6.0) and attempts (HR = 2.8, 95% CI 1.5–5.4). For women, suicidal threats (HR=9.4, 95%

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CI 4.0–21.6) and attempts (HR=4.4, 95% CI 1.5–12.7) were also significantly associated with violence.) Age, substance use, hostility, and major depression had no impact on this relationship in either sex (Witt et al., 2014).

A longitudinal cohort study covering 24,297 patients, a matched control group from the general population, and unaffected siblings explored the risk factors for violent crime, suicide, and premature mortality in schizophrenia (Fazel et al., 2014). Substance use, history of violent crime, and self-harm were found to increase the risk of violent crime, suicide, and premature mortality. In addition, Fazel et al. found that prior conviction for a violent offence and married/cohabitating status increased the risk of suicide.

A systematic review (Hawton et al., 2005) yielded different results when examining for predictors of suicide associated with schizophrenia. Main factors of suicide risk were affective symptoms, suicidal thoughts and behaviour. In contrast to findings in the general population (Husky et al., 2013), alcohol misuse was not associated with an increased risk of suicide, only drug misuse or dependence was. Comparing with mood disorders, alcohol intake immediately preceding the suicide attempt was significantly lower in schizophrenia (Ishii et al., 2014). Studies yielded conflicting results: suicide risk was either increased by living alone (Hawton et al., 2005) or by being married or cohabitating (Fazel et al., 2014). The diversity of methods (big cohort study with matched control group versus systematic review) might explain the discrepancy in the findings.

The aim of the present study was to identify predictors of suicide attempts within 24 h following the index violent crime in patients with schizophrenia spectrum disorders.

2. Methods

2.1. Sample

In Hungary, all mentally ill offenders who would have been sentenced to more than one year in prison must serve their sentence in the National Institute of Forensic Psychiatry (NIFP), the country's only forensic psychiatric institute. Those sentenced for a violent crime or posing danger to the public are placed in the NIFP by court order. This centralized placement of all mentally ill offenders in Hungary provides unique access to a comprehensive database that covers the entire country.

During the 2000–2010 study period, 223 patients with schizophrenia spectrum disorders who had committed violent crimes were released from the NIFP. The full legal and medical documentation of the released patients were reviewed. The following information was extracted from the legal and medical/psychiatric records: age, sex, diagnosis, family history of psychiatric illness, history of substance use, including the use of alcohol or illicit substances, alcohol or substance abuse, or dependence, and suicide attempts before the index violent crime. Legal classification of the offences was also performed.

There were 188 (84.3%) men in the sample, and age at the time of perpetration was 37.0 ± 12.5 years. The following diagnostic categories according to ICD-10 criteria (World Health Organisation. (1992)) were included: schizophrenia paranoid type (F20.0); hebephrenia (F20.1); catatonic schizophrenia (F20.2); residual schizophrenia (F20.5); and schizoaffective disorder (F25.). To determine predictors of suicide attempts that occurred immediately after the violent crime, a comparison was made between patients with and without suicide attempts after the crime.

The study protocol was approved by the Institutional Review Board of Semmelweis Medical University, Budapest. As no personal particulars appeared in the database, individual patients could not be identified and hence informed consent was not necessary.

2.2. Statistical analysis

Groups of patients with and without suicide attempts after violent crimes were compared. Descriptive data are given here with means $\pm$ standard deviations. Comparison of the variables was computed using the SPSS statistical package, Version 10.0. When continuous variables did not show significant departure from normality, they were compared with two-samples *t*-tests, discrete variables with chi-square tests or when the expected count in a cell was less than 5, with Fisher's exact test. All variables with significantly different scores between the suicidal and non-suicidal groups were entered into a binary logistic regression model, using suicide as the dependent variable to explore the relationship between the variables.

3. Results

The diagnostic distribution according to ICD-10 criteria (World Health Organisation. (1992)) was as follows: schizophrenia paranoid type (F20.0), 149 (50.7%); hebephrenia (F20.1), 22 (7.5%); catatonic schizophrenia (F20.2), 2 (0.7%); residual schizophrenia (F20.5), 29 (10%); and schizoaffective disorder (F25.), 21 (7.1%). 26 patients (11.6%) attempted suicide after the violent crime. A comparison of patients with and without suicide attempts is presented in Table 1. Detailed examination of the family relationship of the perpetrator and the victim revealed that only seven out of the 13 victims under the age of 14 were close relatives of patients who attempted suicide. A binary logistic regression model revealed that only two variables, the victim's age (≤ 14 years) (B: 2304; df:1; $p < 0.001$) and the perpetrator's marital status (B:- 0571; df:1; $p = 0.028$) were significantly correlated with suicide attempts.

4. Discussion

A strong correlation between violence and suicidal behaviour has been repeatedly described (Witt et al., 2014), but to the best of our knowledge this was the first study to explore the predictors of suicide attempts immediately after violent crimes in patients with schizophrenia spectrum disorders. While in previous studies several general predictors of suicide in schizophrenia were identified (Hawton et al., 2005; Hor and Taylor, 2010), only some of those factors were characteristic of violent offenders who attempted suicide (Table 1). Previous suicide attempts were not more frequent in suicidal patients than in their non-suicidal, violent counterparts in the studied sample (Table 1). Alcohol or drug use and perpetration under the influence of any psychoactive substance were also not characteristic of those who attempted suicide following a violent act (Table 1), although several studies identified alcohol use as risk factor for suicide both in the general population and in schizophrenia (Hawton et al., 2005). In accord with the finding that suicide attempts are more common among women in the general population (Fekete et al., 2005), female sex more than doubled the relative risk for suicide attempts (Table 1). The proportion of perpetrators living alone was much higher in the non-suicidal group in this study. Binomial logistic regression analysis showed significant difference between these groups in terms of family status. Being single and socially isolated was listed among the risk factors of suicide in a previous review (Pompili et al., 2007), but the opposite finding has also been reported (Fazel et al., 2014).

The victims of violent crimes perpetrated by patients with