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Predictors of short-term repetition of self-harm among patients admitted to an emergency room following self-harm: A retrospective one-year cohort study

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ABSTRACT

We conducted a retrospective chart-review study, examining predictors of the repetition of short-term self-harm (< 1 month and < 6 months) among the patients who were admitted to an emergency department in Japan following self-harm. A total of 405 patients were enrolled and were followed-up for a subsequent one year. The incidence of repeated self-harm within one- and six- months were 6.4% and 13.1%, respectively. Cox's proportional hazards model analyses demonstrated that history of self-harm and comorbid physical illness were associated with repeated self-harm within one month. The patients who lived alone and who were directly discharged from the emergency room after referral to a psychiatrist were at higher risk for repeated self-harm within both one and six months. Living on public assistance and having been discharged from psychiatric wards within the past 12 months were associated with repetition within six months. These risk factors should be incorporated into routine assessment at an emergency room, and elaborate follow-up plan should be provided to the patients with these risk factors upon discharge from the emergency room. Further prospective studies are warranted, addressing more comprehensive factors that are associated with short-term risk for self-harm and suicide.

1. Introduction

Prevention of suicide is a health priority in many countries (Kapur et al., 2006; Mann et al., 2005). Over 800,000 people die due to suicide every year, accounting for 1.4% of all deaths worldwide and making it the 15th leading cause of death in 2012 (World Health Organization, 2016).

Among many potential measures to prevent suicide, targeting people who attempted suicide and helping them avoid repeated attempts is considered one of the most potent measures. This is because a non-fatal suicide attempt is a very strong predictor of later death by suicide (Da Cruz et al., 2011; Isometsa and Lonnqvist, 1998; Nordentoft et al., 2011). Hospital emergency departments can potentially serve as important opportunities for suicide prevention (Da Cruz et al., 2011; Kawanishi et al., 2014; Pompili et al., 2005), as a large number of patients who attempt suicide will present to hospital emergency

departments (Doshi et al., 2005; Vastag, 2001; The Fire and Disaster Management Agency, 2013). Indeed, patients admitted to an emergency room (ER) following self-harm are at higher risk for repeated self-harm or suicide, compared with the general population (Cooper et al., 2005; Olfson et al., 2013; Owens et al., 2002).

On presentation to the ER, triaging those patients according to the level of risk for a subsequent suicide attempt is pivotal, since it guides clinical decisions made by medical providers (McDowell et al., 2011). Past studies show that a substantial proportion of patients who have attempted suicide will make a further attempt in a very short term: 1.4–2.8% within 5 days, and 2.1–4.5% within one month (Bilen et al., 2011; Kapur et al., 2006; Kawanishi et al., 2014). Therefore, it is critical to identify signs that indicate a risk of repeating a suicide attempt within a short term.

However, despite many studies that have evaluated risk factors for subsequent suicide attempts, most of them only focused on risk factors

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that predict suicide over longer periods of time, such as months and years. Only a few studies focused on short-term risk (e.g., one month) (Bilen et al., 2011; Britton et al., 2012; Kapur et al., 2006; Luoma et al., 2002; Olfson et al., 2016). No published study, so far, has evaluated short-term risk factors among patients who present at ERs.

In the current study, we aimed to explore predictors of subsequent self-harm, including attempted suicide, within a short term (< 1 month and < 6 months) among patients who presented at an ER following self-harm. We examined whether the factors that are known to be associated with self-harm repetition in the longer term also apply to short-term risk.

2. Method

2.1. Study design

We conducted a single-center, retrospective chart-review cohort study on patients who were admitted to an ER with an episode of self-harm. The subjects were followed-up for one year after the index episode. The predictive factors for short-term repetition of self-harm were explored.

2.2. Subjects

The eligible subjects were patients admitted to the ER of National Hospital Organization Kumamoto Medical Center (NHO-KMC hospital), Japan, following an episode of self-harm during the period between April 2013 and March 2014. In our definition, self-harm included both self-harm and aborted or interrupted suicide attempts. Self-harm was defined as “any act of self-poisoning or self-injury irrespective of the apparent purpose of the act” (NHS Centre for Reviews and Dissemination, 1998), or irrespective of level of medical seriousness (Kapur et al., 2006). Those who's self-harm was fatal (i.e., death by suicide) were excluded.

The NHO-KMC hospital is a tertiary medical facility and is one of the 284 government-designated emergency critical care centers in Japan, which are equipped with a sufficient number of multidisciplinary medical staff expected to provide 24-h emergency service to patients in life-threatening condition. The NHO-KMC hospital is the only facility in the city that is equipped with both an emergency critical care center and a psychiatry ward, covering approximately 40% of ambulance transportation cases due to self-harm in Kumamoto prefecture (approximately 1.8 million inhabitants within an area of 7404 km²; The Fire and Disaster Management Agency, 2014).

ER physicians attend to patients who present to the ER during the daytime. During out-of-hours, patients are seen by physicians of different subspecialties who work night duty in a rotating manner. The physicians on night duty engage in triage and initial management of patients who come to the ER. The patients will be referred to a specialist (e.g., psychiatrist) if he or she is considered to be in need of advanced care. In most cases self-harm patients are initially admitted to the emergency ward. After recovery from acute physical problems, they will be referred to a psychiatrist who will decide whether the patient should be discharged or moved to the psychiatry ward. If a patient has severe psychiatric problems and does not have severe physical problems, he or she will be admitted to the psychiatric ward directly from the ER.

2.3. Procedure

First, we identified eligible subjects through an electronic search of the hospital database. If a single patient had multiple ER visits due to self-harm, only the first episode during the study period was extracted (i.e., index episode). Then, the subjects were retrospectively followed-up for 12 months after the index episode. The subject was defined as having an episode of repeated self-harm if any subsequent self-harm

was identified in their medical records during the study period.

In order to explore the factors associated with short-term risk of self-harm repetition, we evaluated sociodemographic and clinical characteristics of the subjects, which clinical guidelines suggest are risk factors of suicide (American Association of Suicidology, 2010; American Psychiatric Association, 2003; WHO, 2000; Victoria State Government, 2010; NSW Government, 2012; Simon Baston and the NICE Self-Harm Guideline Development Group; U.S. Department of Health and Human Services, 2009; The Japanese Association for Emergency Psychiatry, 2009). These included demographic variables (age and sex), socioeconomic variables (employment status, living status (cohabiting), and financial status (under public assistance)), clinical variables (history of self-harm, current and previous psychiatric history, comorbid physical illness, and history of psychiatric hospitalization within 12 months of the index episode), whether the patients were hospitalized and/or received intervention by a psychiatrist, and whether referral was made after discharge. We did not include clinical symptoms, such as agitation, impulsivity, or a detailed social and medical history, such as substance use, history of childhood abuse, family history of psychiatric illnesses, detailed status of social support, since these variables were not well documented in most of the medical records. Two psychiatrists (YYK and DF) independently assessed the presence of those variables. When their assessment was discrepant, they conferred until coming to an agreement.

This study was approved by the Institutional Review Board of the NHO-KMC Hospital and the Keio University School of Medicine.

2.4. Statistical analysis

We used Cox proportional hazard models with 95% confidence interval to examine the factors associated with repeated self-harm. The factors that showed an association in univariable analyses with a *p* value of < 0.1, as well as age and sex, were entered into the subsequent multivariable analyses. The significance level was set at *p* = < 0.05 (two-sided). We conducted a sensitivity analysis by generating a multivariable model where all the possible variables were entered with backward elimination procedures. The analyses were conducted using SPSS Version 22.

3. Results

A total of 529 episodes of self-harm were identified in the medical records during the study period. Of those, 30 episodes were excluded because they died by suicide. The remaining episodes consisted of 405 individuals presenting with 499 episodes. We included those 405 index episodes in the analyses.

The characteristics of the subjects are shown in Table 1. The mean age of subjects was 39.7 years, ranging from 12 to 88 years. Approximately 70% of subjects were female, and 80% had been transported to the hospital by ambulance. The most common method of self-harm was drug overdose (65.7%). After initial treatment at the ER, approximately 75% of subjects received psychiatric intervention during their stay. Approximately 45% of subjects saw a psychiatrist during hospitalization in the emergency ward, and 14% were directly admitted to the psychiatric ward from the ER. Approximately 16% were directly discharged from the ER after referral to a psychiatrist.

During the observation period, the incidence of repeated self-harm within one, six, and twelve months was 26 (6.4%), 53 (13.1%), and 66 (16.3%), respectively.

In the univariable analyses, living alone, living on public assistance, and history of psychiatric treatment were associated with repeated self-harm, both within one month and six months. Past history of self-harm was associated with repetition within one month. Patients who were not under employment or education, were under current psychiatric treatment, and had a recent history of psychiatric hospitalization within 12 months of the index episode were more likely to repeat self-harm

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