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Brief report: Self-cutting and risk of subsequent suicide

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Abstract:

Background: Some studies suggest that people who self-cut have a higher risk of suicide than those who self-poison. Self-cutting ranges from superficial wrist cutting to severe self-injury involving areas such as the chest, abdomen and neck which can be life threatening. This study aimed to investigate whether the site of self-cutting was associated with risk of subsequent suicide.

Methods: We followed-up 3928 people who presented to hospital following self-harm between September 2010 and December 2013 in a prospective cohort study based on the Bristol Self-harm Surveillance Register. Demographic information from these presentations was linked with coroner's data to identify subsequent suicides.

Results: People who presented with self-cutting to areas other than the arm/wrist were at increased risk of suicide compared to those who self-poisoned (HR 4.31, 95% CI 1.27 to 14.63, p=0.029) and this increased risk remained after controlling for age, sex, history of previous self-harm and psychiatric diagnosis (HR 4.46, 95% CI 1.50 to 13.25, p<0.001). We observed no such increased risk in people presenting with cutting to the arm/wrist.

Limitations: These data represent the experience of one city in the UK and may not be generalisable outside of this context. Furthermore, as suicide is a rare outcome the precision of our estimates is limited.

Conclusions: Site of self-injury may be an important risk factor for subsequent suicide.

Key words: Self-harm; Suicide; Methods of self-harm; Risk factors; Psychiatric epidemiology; Attempted suicide

Introduction

The risk of suicide in people who have self-harmed is estimated to be 50 times greater than that of the general population and 15% of people who die by suicide present to hospital following self-harm in the year leading up to their death.(Gairin et al., 2003; Hawton et al., 2015) Reducing the risk of suicide in people with a history of self-harm is therefore a key focus of suicide prevention strategies in many countries.(Mann et al., 2005) Hospital presentation following an episode of self-harm is common and encompasses a broad range of behaviours from attempted hanging to superficial cuts to the forearm. The most frequent method used for self-harm amongst people who present to hospital, and that which is most likely to be referred for a psychosocial assessment, is deliberate overdose.(Bennewith et al., 2005)

Available evidence suggests that rarer, high lethality methods of self-injury, such as hanging, are associated with elevated suicide risk.(Bergen et al., 2012; Runeson et al., 2010) The evidence is less clear for other methods such as self-cutting. Some studies suggest self-cutting is associated with an increased risk of suicide,(Bergen et al., 2012) while others have failed to replicate this finding.(Runeson et al., 2010) Despite this possible elevated risk, people presenting with self-cutting are less likely than other people who self-harm to be admitted to a hospital bed and receive a psychosocial assessment.(Bennewith et al., 2005)

To the best of our knowledge, no studies have investigated the association of method of self-harm, focussing on the site of self-cutting for people who self-injure, with the risk of subsequent suicide. We have followed-up a cohort of people who have self-harmed to investigate the association of different methods of self-harm with subsequent suicide risk. Specifically, we examine whether the risk of suicide following a hospital presentation for self-injury varies by the site of self-cutting.

Methods

We used first (index) episodes of hospital presenting self-harm that were prospectively recorded on the Bristol Self-harm Surveillance Register.(Williams, 2015) These included index episodes for self-harm made between 1st September 2010 and 31st December 2013, followed up until the 31st of December 2014. Data collection started at one of the major general hospitals in the Bristol area in 2010 and expanded to include the other major hospital in Bristol from April 2013 onwards. Self-harm was defined as any intentional self-harm presentation, irrespective of motivation or level of suicidal intent. The medical notes of all potential cases were used to assess whether the episode was intentional or accidental.

Clinical details were obtained from general hospital records. Self-report and records from the local mental health trust were used to collect information on mental health service use. Information on previous self-harm and psychiatric diagnoses came from medical notes, including information from an initial risk assessment at triage and, where available, information from psychosocial assessments undertaken by the Liaison Psychiatry Service. Suicides were identified by linking demographic information on the people who have self-harmed with data from the local Coroner's office. All potential deaths from suicide in England are investigated by Coroners who serve specific geographic areas. Based on their findings, Coroners determine whether the death was suicide, accidental, due to natural causes or of undetermined intent (such deaths, most of which are likely suicides, receive open verdicts)(Gunnell et al., 2013); in some cases they give narrative verdicts describing the circumstances of the death. In this study, cases were defined as those assigned a suicide or open verdict following a coroner's inquest. Narrative verdicts describing circumstances where individuals had taken their own lives were also classified as suicides.

Details of the method used during the episode of self-harm were recorded for all episodes. If the episode involved self-injury, free text was used to record the details of the injury (e.g. "lacerations to right forearm" or "stab wounds to abdomen" or "attempted hanging"). The type of self-harm was categorised into three main groups, i) self-injury (regardless of the site of self-injury), ii) self-poisoning, or iii) combined self-poisoning and self-injury. The category of self-injury was further subdivided based on the description of the episode into cutting (arm), cutting (non-arm) and self-injury (other). Cutting - non-arm was defined as any self-injury episode including key words describing cutting/stabbing to areas of the body other than the arm or wrist: e.g. neck, chest, abdomen, leg, thigh, or calf. Self-injury – other was used to classify all other episodes of self-injury such as attempted hangings, burning and jumping episodes. This category included all other self-injury where the site of the injury was not specified.

Cox regression was used to compare the risk of suicide in people presenting to hospital with different methods of self-harm. People were deemed at risk until the end of follow-up (31st of December 2014) or until they experienced the event of interest. Both crude and adjusted hazard ratios (HR) were calculated adjusting for age, sex, previous self-harm and psychiatric diagnostic category. All analyses were undertaken in Stata V13.1 (Stata Corp, College Station TX, 2013). Ethical approval of the data collection for the Bristol Self-harm Surveillance Register was obtained from the National Research Ethics Service of the NHS.

Results

Information was available on 3928 people who had self-harmed; 58.9% [2312/3928] were female. Their age ranged from 14 to 101. The median age of males was greater than that of females (male vs. female: 33 vs 29, p<0.001). Over three quarters of presentations involved self-poisoning only (76.4% [3001/3928]). In terms of psychiatric diagnoses, affective disorders were most common in this cohort (23.0% [903/3928]) followed by personality disorders (7.7%, 303/3928). Just over a quarter (28.6%, 1125/3928) of people were recorded as having no current psychiatric diagnoses.

The mean follow-up time was 2.1 years. We identified 27 (0.7% [27/3928]) people who went on to die by suicide following their initial self-harm presentation. Older age (HR per 1 year increase in age: 1.03, 95% CI 1.01 to 1.05) and male gender (HR 2.44 95% CI 1.12 to 5.34) were associated with an increased risk of death by suicide.

There were no recorded suicides in people presenting with cutting to their arms and wrists. The odds of subsequent suicide appeared greater in people presenting with cutting at a site on their body other than their arm when compared to those using self-poisoning (HR 5.43, 95% CI 1.85 to 15.96, Table 1) and this association persisted (HR 4.46, 95% CI 1.50 to 13.25, Table 1) after controlling for potential confounders (age, sex, previous self-harm and psychiatric diagnostic category). Excluding people who used stabbing (n=29, 2 in arm, 17 in non-arm, 4 in other, 6 in self-injury and self-poisoning), as opposed to cutting, from the analysis did not alter these findings, suggesting the observed increased risk was not related to the type of self-cutting.

TABLE 1

Discussion

We found an elevated risk of suicide in people who presented to hospital with self-cutting to areas of the body other than their arms and wrists (e.g. to the neck or chest) compared to people presenting with self-poisoning.

People who present to hospital with rarer high lethality methods of self-harm, such as attempted hanging or asphyxiation, have consistently been shown to be at heightened risk of subsequent suicide.(Bergen et al., 2012; Kuo et al., 2012; Runeson et al., 2010)

Studies of the association of self-cutting with subsequent risk of suicide have produced varying results, some suggesting risk is lower in this group,(Pan et al., 2012) some that risk is no different,(Runeson et al., 2010) and others suggesting risk is increased.(Bergen et al., 2012; Cooper et al., 2005) This heterogeneity in results is likely to be in part related to variations in the characteristics of the different study samples. Some were based on in-patient admissions, a potentially high-risk subgroup of the general hospital presenting self-harm population, while other studies included all attendances to Emergency Departments. Our results suggest people whose self-cutting includes sites of the body other than the wrist/arm have an increased risk of suicide.

A comprehensive psychosocial assessment is a key component of self-harm patient care and is recommended in a number of clinical guidelines.(National Institute for Clinical Excellence, 2004) People who present to hospital with self-cutting are 56% less likely to receive an assessment compared to people presenting with self-poisoning.(Kapur et al., 2008) Given the current finding of an increased risk of suicide in people presenting with self-cutting to areas of the body other than the arm/wrist, this inequality in service provision seems unjustified.

Our findings suggest that the site of self-cutting may be an important consideration when assessing suicide risk in people who have self-harmed. It could be that site of self-cutting may be associated with suicidal intent. Nevertheless, it should be remembered that individuals who self-harm without, or with low suicidal intent, are at risk of a range of adverse outcomes compared to the general population.(Mars et al., 2014)

These findings should be interpreted cautiously as they represent the experience of one city in the UK and it may not be possible to draw inferences applicable to the general population. It was also outside the scope of the current study to link our register data to national mortality data. As such we will have missed people who self-harm and go on to die by suicide outside the jurisdiction of the local Coroner. Furthermore, the accuracy of the current effect estimates are limited due to the relative rarity of suicide. Further investigation of this finding in other centres and in larger prospective cohorts is essential before the current observed association between site of self-cutting and suicide can be confirmed.

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Table 1. Hospital presenting self-harm patient characteristics and risk of subsequent suicide

	HR Crude model[a]	CI	p	HR Fully adjusted model	CI	p[b]
Method of self-harm						
Self-poisoning (n=3001, n=19 suicides)	1.00	-		1.00	-	
Self-cutting - arm[c] (n=375, n=0 suicides)	-	-		-	-	
Self-cutting - non-arm (n=127, n=4 suicides)	5.42	1.84 to 15.94	0.009	4.46	1.50 to 13.25	<0.001
Self-injury - other (n=158, n=1 suicides)	1.11	0.15 to 8.28		0.77	0.09 to 6.23	
Self-injury & self-poisoning (n=267, n=3 suicides)	2.36	0.70 to 8.02		2.20	0.64 to 7.55	
Age (1 year increase in age)	1.03	1.01 to 1.05	0.005	1.03	1.01 to 1.06	0.015
Sex						
Female	1.00	-	0.025	1.00	-	0.022
Male	2.44	1.12 to 5.34		2.52	1.14 to 5.57	
Previous self-harm						
No	1.00	-	0.057	1.00	-	0.090
Yes	3.21	0.97 to 10.65		2.95	0.85 to 10.26	
Psychiatric diagnosis[d]						
Affective	4.31	1.32 to 14.05		3.05	0.92 to 10.14	
Personality	6.12	1.35 to 27.65		4.60	0.97 to 21.77	
Psychosis	8.11	1.48 to 44.38		4.58	0.78 to 26.80	
Organic	-	-	0.034	-	-	0.117
Somatoform	-	-		-	-	
Other	2.97	0.73 to 11.98		1.96	0.48 to 8.07	
Unknown	4.94	1.31 to 18.62		3.80	0.99 to 14.63	

a) the crude model outlines univariable estimates for each variables association with suicide b) p-values are derived from likelihood ratio tests comparing the fully adjusted model with and without the covariate of interest. c) There were no events in the "Self-Cutting - arm" group. d) The reference group here is people who did not have a current psychiatric diagnosis. There were no events in the organic or somatoform categories.