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Mortality, functional and return to work outcomes of major trauma patients injured from deliberate self-harm

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ABSTRACT

Background: Self-harm and intentional injuries represent a significant public health concern. People who survive serious injury from self-harm can experience poor outcomes that negatively impact on their daily life. The aim of this study was to investigate a cohort of major trauma patients hospitalised for self-harm in Victoria, and to identify risk factors for longer term mortality, functional recovery and return to work.
Method: 482 adult major trauma patients who were injured due to self-harm and survived to hospital discharge, and were captured by the population-based Victorian State Trauma Registry (VSTR), were included. For those with a date of injury from January 1, 2007 to December 31, 2013, demographics and injury event data, Glasgow Outcome Scale Extended (GOS-E) and return to work (RTW) outcomes at 6, 12 and 24 months post-injury were extracted from the registry. Post-discharge mortality was identified through the Victorian Registry of Births, Deaths and Marriages (BDM). Multivariable logistic regression was used to determine predictors of the GOS-E and RTW and survival analysis was used to identify predictors of mortality.
Results: A total of 37 (7.7%) deaths occurred post-discharge. There were no clear predictors of all-cause mortality. Overall, 36% of patients reported making a good recovery at 24 months. Older age ($p = 0.01$), transport-related methods of self-harm ($p = 0.02$), higher Injury Severity Score ($p < 0.001$) and having a Charlson Comorbidity Index weighting of one or more ($p = 0.02$) were predictive of poorer functional recovery. Of patients who were working or studying prior to injury, 54% reported returning to work by 24 months post-injury. Higher Injury Severity Score was an important predictor of not returning to work ($p = 0.002$).
Conclusion: The vast majority of major trauma patients who self-harmed and survived to hospital discharge were alive at two years post-injury, yet only half of this cohort returned to work and just over a third of patients experienced a good recovery.

Introduction

Deliberate self-harm and intentional injury represent a significant public health concern. Self-harm is the second leading cause of death from injury, and together with road traffic crashes, account for the majority of the total burden of injury [1,2]. But while the rate of unintentional injuries is projected to decrease, the incidence of intentional injuries is expected to rise significantly. The World Health Organisation (WHO) estimates that between 2002 and 2030, the global burden of self-inflicted injuries is expected to move up three places in the rank order of total DALYs worldwide [3].

Deliberate self-harm has been broadly defined as an act in which an individual deliberately inflicts harm upon themselves, but does not directly result in death [4]. The majority of self-harm cases survive [5–7], and examination of the outcomes of deliberate self-harm provides important insights into the burden of intentional injury. This can potentially inform clinical decision-making and health care planning for those injured by self-harm.

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People who self-harm are at risk of further repeated self-harm and poor outcomes [8–12]. Their long-term outcomes, such as function and return to work, are largely unknown and have received very little research attention. The strongest evidence available are two birth cohort studies that suggested individuals who self-harm are subject to poor occupational outcomes and poor functioning [12,13], however these studies provided evidence that was generalisable to self-harm in young people only. The outcomes of self-harm in a major trauma population have not previously been explored to the authors' knowledge. The aims of this study were to describe the mortality, functional and return to work outcomes in the first two years after injury in a cohort of major trauma patients hospitalised for injuries resulting from deliberate self-harm.

Methods

Setting

The Victorian State Trauma Registry (VSTR) is a state-wide, population-based registry which captures information including demographics, cause and intent of injury, diagnoses and comorbidities of all hospitalised major trauma cases [14]. A case is included if any of the following criteria are met: (1) death after injury; (2) Injury Severity Score (ISS) > 12 based on the 2008 version of the Abbreviated Injury Scale; (3) admission to an Intensive Care Unit (ICU) for more than 24 h and requiring mechanical ventilation for at least part of their stay; or (4) urgent surgery. All major trauma patients who survive to hospital discharge and do not opt off the registry are followed up by trained telephone interviewers to collect self-reported information on pre-injury disability and employment status, and functional and return to work outcomes at 6, 12 and 24 months post-injury [14].

Participants

Major trauma patients who had self-harmed and survived to discharge were identified in the VSTR using the injury intent coding 'intentional self-harm' which is recorded by clinical coding staff. This was cross-checked and validated against International Classification of Diseases 10th Revision – Australian Modification (ICD-10-AM) codes and the free text narratives describing the injury event extracted from the medical record by registry coders. Patients were included in this study if they met each of the following criteria:

i. Injury intent code 'intentional self-harm';
ii. Date of injury from January 1, 2007 to December 31, 2013;
iii. Aged 16 years and over;
iv. Survived to hospital discharge.

Where patients were admitted more than once for the management of major trauma due to self-harm within the study period, the first admission was used and any further admissions considered recurrent episodes of self-harm.

Procedures

A de-identified dataset was extracted from the VSTR including demographic data, injury event details, length of hospital stay (LOS), ICD-10-AM diagnoses and comorbidities and outcomes data at 6, 12 and 24 months post-injury. Postcodes of patients' place of residence at the time of injury were mapped to the Socio-Economic Indexes for Areas (SEIFA) Accessibility/Remoteness Index of Australia (ARIA) and the Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD), a widely accepted measure of relative socioeconomic advantage and disadvantage [15]. An area with a high score on the IRSAD has a relatively high incidence of advantage and a relatively low incidence of disadvantage [15].

The method of self-harm was derived from the 'injury cause' variable recorded on the VSTR and included; cutting, piercing or stabbing injury with a sharp object (hereafter denoted as 'cutting'),

Table 1
Demographic and injury characteristics of major trauma patients who self-harmed recorded in the VSTR between 2007 and 2013.

Demographics	Men n = 344	Women n = 138	All cases n = 482
	n (%)	n (%)	n (%)
Age group (years)			
16–24	65 (18.9)	30 (21.7)	95 (19.7)
25–34	82 (23.8)	38 (27.5)	120 (24.9)
35–44	77 (22.4)	29 (21.0)	106 (22.0)
45–54	59 (17.2)	22 (15.9)	81 (16.8)
≥55	61 (17.7)	19 (13.8)	80 (16.6)
Method of self-harm			
Cutting	129 (37.5)	36 (26.1)	165 (34.2)
Transport-related[*]	71 (20.6)	31 (22.5)	102 (21.2)
Falls[†]	56 (16.3)	42 (30.4)	98 (20.3)
Threats to breathing[‡]	50 (14.5)	15 (10.9)	65 (13.5)
Other self-harm[§]	38 (11.1)	14 (10.1)	52 (10.8)
SEIFA-ARIA[a]			
Major Cities	240 (73.4)	107 (81.7)	347 (75.8)
Regional or Remote Australia	87 (26.6)	24 (18.3)	111 (24.2)
SEIFA-IRSAD quintile[b]			
Highest	84 (25.7)	32 (24.4)	116 (25.3)
High	60 (18.4)	35 (26.7)	95 (20.7)
Middle	72 (22.0)	33 (25.2)	105 (22.9)
Low	53 (16.2)	12 (9.2)	65 (14.2)
Lowest	58 (17.7)	19 (14.5)	77 (16.8)
ISS[c]			
<9	67 (20.1)	23 (17.3)	90 (19.3)
9–15	104 (31.2)	27 (20.3)	131 (28.1)
16–24	79 (23.7)	35 (26.3)	114 (24.5)
>24	83 (24.9)	48 (36.1)	131 (28.1)
Hospital length of stay (days) Median (IQR)	8.8 (15.4)	14.6 (27.7)	9.4 (18.7)
CCI weighting			
None	191 (55.5)	82 (59.4)	273 (56.6)
≥1	153 (44.5)	56 (40.6)	209 (43.4)
Any Mental Disorder	236 (68.6)	102 (73.9)	338 (70.1)
Organic mental disorders	37 (10.8)	14 (10.1)	51 (10.6)
Schizophrenia	69 (20.1)	17 (12.3)	86 (17.8)
Mood disorders	134 (39.0)	69 (50.0)	203 (42.1)
Neurotic disorders	61 (17.7)	23 (16.7)	84 (17.4)
Personality disorders	21 (6.1)	29 (21.0)	50 (10.4)
No. of mental disorders present	91 (26.5)	33 (23.9)	124 (25.7)
None			
1	146 (42.4)	49 (35.5)	195 (40.5)
≥2	107 (31.1)	56 (40.6)	163 (33.8)
Any Substance Use Disorder	112 (32.6)	50 (36.2)	162 (33.6)
Alcohol	85 (24.7)	34 (24.6)	119 (24.7)
Drugs	38 (11.1)	19 (13.8)	57 (11.8)
Both Mental and Substance Use Disorder	72 (20.9)	39 (28.3)	111 (23.0)

SEIFA, Socio-Economic Indexes for Areas; ARIA, Accessibility/Remoteness Index of Australia; IRSAD, Index of Relative Socioeconomic Advantage and Disadvantage; ISS, Injury Severity Score; IQR, Interquartile range; CCI, Charlson Comorbidity Index.

[*] Transport related methods included being a passenger or driver in motor vehicle or being a pedestrian.

[†] Includes high and low falls.

[‡] Threats to breathing includes submersion, drowning, strangulation, asphyxiation or other threat to breathing.

[§] Includes fire, flames, smoke scalds, collision with person/object, self-poisoning, machinery or unspecified external method.

[a] Postcodes missing for n = 24 cases.

[b] Postcodes missing for n = 24 cases.

[c] Data missing for n = 16 cases.