

IS A SELF-INFLICTED BURN PART OF A REPEATED SELF-HARM PATTERN?

LES BRULURES AUTO-INFLIGÉES, FONT ELLES PARTIE DE L'AUTOMUTILATION REPETÉE?

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SUMMARY. Self-inflicted burns (SIB) consistently account for a small proportion of burn injuries. There is a wide spectrum of SIB, from minor burns through to major life threatening burn injuries in suicidal patients who have committed self-immolation. Non-fatal deliberate self-harm (DSH) is a common reason for presenting to hospital. This occurs in many forms including wounding, burning and poisoning to name a few. Such behaviours are commonly repeated, sometimes with increasing severity. DSH is a major risk factor for subsequent suicide. We had observed patterns of repeated self harm behaviours in patients presenting to our centre with SIB. Patterns of repeated DSH in those presenting with self-inflicted burns have not previously been described in the literature. In a five-year period (2008 to 2012) 84 patients presented to our burns centre with SIB. Within this population, 39 patients (46%) were identified on a national database as having been admitted to an acute National Health Service (NHS) trust somewhere in the UK with sequelae of deliberate self-harm. There had been a total of 128 additional hospital admissions. In the majority of cases (85%) another admission preceded the presentation to our service with SIB. Only four out of the 17 SIB patients (24%) who died of their injuries had previous hospital admissions with DSH. This lends weight to the need for thorough holistic assessment of any patient admitted to hospital with sequelae of deliberate self-harm in order to try and provide appropriate support and interventions for these vulnerable individuals to prevent recurrent self-harm or suicide.

Keywords: self-inflicted burns, deliberate self-harm, NHS

RÉSUMÉ. Les brûlures auto-infligées ne représentent qu'une faible proportion de ce traumatisme. Il existe un large éventail de ce type de lésions depuis les blessures mineures jusqu'aux brûlures graves chez les patients suicidaires. L'automutilation survient sous de nombreuses formes. Ces comportements sont souvent récidivants, parfois avec sévérité croissante, et représentent un facteur de risque majeur de suicide ultérieur. Nous avons observé des cas de comportements répétés d'automutilation chez nos patients. Dans une période de cinq ans (2008-2012) 84 patients ont été admis dans notre centre avec des brûlures auto-infligées. Dans cette population, 39 patients (46%) ont été identifiés sur une base de données nationale comme ayant été admis dans une Association du Service National de Santé britannique quelque part dans le Royaume-Uni avec des séquelles d'automutilation. Il y avait eu un total de 128 hospitalisations supplémentaires. Dans la majorité des cas (85%) une autre admission précédait l'arrivée dans notre service. Seulement 4 des 17 patients (24%) morts de leurs blessures avaient eu des hospitalisations précédentes pour automutilation. Cela montre la nécessité d'une évaluation globale approfondie de tout patient admis à l'hôpital avec des séquelles d'automutilation, afin d'intervenir par une prise en charge appropriée de ces personnes vulnérables et prévenir l'automutilation ou la récurrence de la tentative de suicide.

Mots-clés: brûlures auto-infligées, automutilation, Service National de Santé britannique

Introduction

Self-inflicted burns (SIB) consistently account for a small proportion of burn injuries presenting to burn serv-

ices. Rates of self-infliction of burn injuries vary widely across the world. Recently reported rates include: 0.9% (USA),¹ 2.2-2.8% (Australia),^{2,3} 3.5%-4.9% (UK),^{4,5} 4.2% (Ireland),⁶ 14% (Fiji),⁷ 15% (France),⁸ 9.8% (Pakistan),⁹

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14.3% (Iran),¹⁰ 22% (Iraq)¹¹ and 43.9% (India).¹²

The patients who present with SIB are far from a homogeneous group.¹³ Psychiatric disorders are the most commonly associated factor,¹ although SIB has also been shown to be a method of malingering in military patients.¹⁴ The spectrum of SIB injuries ranges from those with minor burns of the self-mutilation type such as cigarette, contact, chemical and minor flame burns, to those admitted with severe burns that usually tend to arise from self-immolation, but other modalities are reported.¹⁵ Deliberately inflicted burn injuries are associated with worse outcomes than accidental injuries, both relating to length of stay in hospital^{2,4,16,17} and an increased risk of mortality compared with accidental burn injuries of similar severity.^{4, 17-19} There are significant psychosocial and financial burdens associated with SIB as highlighted in a recent major review on the topic.¹

There is strong evidence from around the world for repetition of DSH.²⁰⁻²³ Retrospective analysis has demonstrated that in patients who have committed suicide, 39% had attended an accident and emergency department in the year before death, of whom 15% had attended because of non-fatal self-harm.²⁴ Furthermore, patients presenting with DSH more than once have approximately double the risk of subsequent suicide compared to those with a single episode.²⁵ The population of patients who self-harm thus represent an important group to target for close psychiatric monitoring and follow-up to prevent repetition of DSH behaviours. Patients who are known to psychiatric services form part of this population and are known to be at risk of repeated DSH behaviours following discharge from psychiatric hospital.²⁶ Large-scale epidemiological studies have also shown that average life expectancy is reduced by thirty years relating to worse physical health in patients who have presented with DSH.²² Moreover, the authors of this study highlighted the importance of enquiring about physical symptoms in patients who present with DSH.²⁰

The purpose of this study was to look for patterns of repeated self-harm within the population of SIB patients presenting to our regional burns service in the West Midlands, England. Our hypothesis is that repeated self-harm is common within the SIB population and that there exists a population of patients who repeatedly injure themselves by burning.

Methods

A retrospective analysis of the demographic characteristics of patients presenting with SIB injuries between 2008 and 2012. The data was retrieved from an adult regional burns service database and represents data collected for the purposes of the International Burn Injury Database (iBID). The electronic clinical records of these patients were searched to find evidence of repeated self-harm behaviours. A database of nationwide admissions to acute

healthcare trusts (Hospital Episode Statistics, HES database)²⁷ was also searched to look for presentations to other hospitals within the UK of any self-harm behaviours and the two datasets were manually merged and rationalised. Statistical analyses were performed with Graph-Pad Prism software.

Results

During the five year period from the start of January 2008 until the end of December 2012 there were 2,536 presentations of acute burn injuries to our regional burn service. Of these, 90 presentations (3.5%) were self-inflicted, but the number of patients within this group was 84, demonstrating a small subpopulation (6/90, 6.7%) of patients who repeatedly self-harm by burning themselves.

The average age of patients at presentation was 40.9 ± 14.3 years (mean ± SD). The ratio of males to females was 1.8:1. This trend was observed across the spectrum of SIB injuries as shown in *Table II*. Within the SIB population, 70% of the patients were Caucasian and 20% were Asian. The remaining 10% were either of another ethnic background or had not had their ethnicity recorded.

Flames caused 80% of SIB injuries compared with 82% in the previous study. The median total body surface area (TBSA) injured by burn was 7.25 ± 25%. Admission to the intensive care unit was necessary for 34 patients (38%). The mortality rate was 19%. These data are summarised in *Tables I* and *II*.

Table I - Summary of patient demographics

Total burns admissions	2536
SIB presentations	90 (3.5%)
Age of patients (mean ± standard deviation)	40.9 ± 14.3 years
Male/female ratio	1.8:1
Ethnicity	70% Caucasian 20% Asian 10% other or not recorded
Average TBSA (median ± interquartile range)	7.25 ± 25%
Admissions to ICU	38%
Mortality	19%
Average length of stay	Mean 17±30 days, median 7 days

Table II - Demographics of SIB population subgroups according to burn size

TBSA (%)	Less than 10%	10 to <30%	>30%
Number of cases	49	18	23
Mean age	38	44	45
Male: female ratio	1.7:1	2:1	1.9:1
Length of stay	5.5	30.1	31.6

Within the SIB patient population, ten patients (11% of the population) had attended our own emergency department with other forms of self-injurious behaviour. These ten patients had presented to our emergency department 24 times in addition to the presentation with a self-inflicted burn. There had been ten presentations of overdose, seven presentations of self-inflicted burns, six with ideation of self-harm or suicide and one with self-inflicted hand trauma. Of these presentations, 13 had preceded the presentation with a self-inflicted burn.

The HES database contains all admissions to acute hospitals in the UK from January 2007 onwards and this was therefore searched to look at repeated DSH resulting in hospital admissions nationwide. Of the 84 SIB patients, 39 (46%) were identified on the database as having been admitted to an acute NHS trust somewhere in the UK with sequelae of deliberate self-harm. There had been a total of 128 additional hospital admissions, with a mean of 3.3 admissions per patient (range 1-10). The methods of DSH are shown in *Fig. 1*.

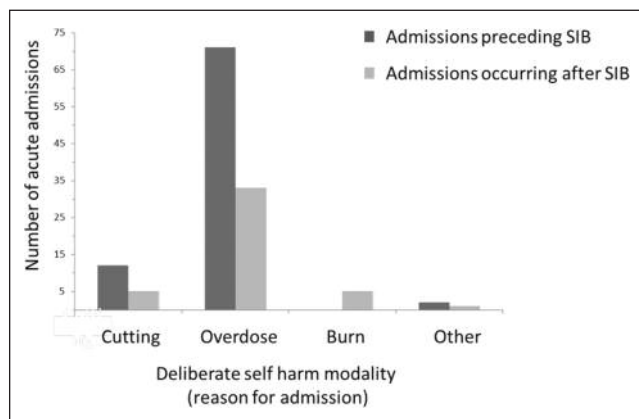


Fig. 1 - Breakdown of methods of harm relating to repeated self-harm episodes in SIB patients comparing pre self-inflicted burn injury and post SIB.

The overwhelming majority (85%) of these patients had been admitted to an acute NHS hospital with sequelae of deliberate self-harm at least once prior to their presentation to our service with a self-inflicted burn. The median size of burn within the repeated DSH group was smaller at $6 \pm 11\%$ TBSA (median \pm interquartile range), compared with the median size of burn in the SIB population as a whole $7.25 \pm 25\%$. The recurrent DSH patients account for a large proportion of the cohort of patients presenting with a small self-inflicted burn (i.e. TBSA of less than 10%) accounting for 63% of this group. The burn related mortality rate in this group of patients with recurrent hospital admissions for DSH was 14% compared with 19% of the SIB population as a whole. Only four out of the 17

SIB patients (24%) who died of their injuries had previous hospital admissions with DSH.

Discussion

We have demonstrated that 44% of patients who present to our unit with a self-inflicted burn have been admitted to an acute hospital following episodes of deliberate self-harm, with an admission for DSH preceding the self-infliction of a burn in 85% of these cases. This indicates that self-infliction of a burn is commonly preceded by other significant forms of self-harm. The most commonly occurring method of DSH in our study was overdose or poisoning, consistent with recent meta-analysis.²⁰ The rate of admission with recurrent SIB after the index episode is very low. This reflects the current practice in our centre of conservative management for small SIB.

In comparison with a descriptive study of the SIB population presenting to our unit ten years ago,⁴ it is interesting to note that the proportion of SIB injuries within the burn injured population is unchanged (3.7 vs 3.5%). However, a reversal has been noted in the previously observed preponderance of female patients presenting with SIB. The ratio of males to females was 0.8:1⁴ in the period 1998-2002, whereas the ratio in the recent study period was 1.81:1. It is not clear why this gender imbalance existed previously and certainly the reversal of the trend is without explanation, however men are at significantly higher risk of suicide compared with women.²⁰ The representation of ethnic groups within the SIB population is also largely unchanged and is in keeping with the local demographic (approximately 11% of the West Midlands populations are of Asian ethnicity, UK Census 2011). Patients presenting with SIB have significantly smaller burns; $7.25 \pm 25\%$ versus $14.5 \pm 43.5\%$ TBSA, $p=0.08$ (Mann-Whitney), partly attributable to the group of patients who inflict small burns upon themselves (54% of our population had suffered less than 10% TBSA burns). There has been a significant reduction in the length of hospital stay related to SIB injuries, from a previous median duration of 13 days (reported as the mean, 22 days) to a median duration of 7 days (mean length of stay 17 days) ($p=0.02$, Mann-Whitney) and a trend towards a reduction in the mortality associated with self-infliction of a burn injury (19% versus 25%, $p=0.3$). These observations are likely to be due to improvements in burns care in the intervening period.

True rates of repetition of DSH are likely to be higher if extended to look at all presentations, not only hospital admissions. A proportion of patients presenting with self-mutilation, especially in the form of superficial cuts and very minor burns, are treated in the emergency department (ED) and discharged following a psychiatric review and hence would not appear in hospital admission figures. It has been estimated that admissions account for

approximately half of all DSH presentations.²⁸ In this study, we were able to look at all presentations to our own ED to examine this phenomenon, however, since less than 28% of the whole SIB population fall directly within the catchment area of our ED, the figures cited are likely to be an underestimate of the true incidence of repetition of self-harm. If it were possible to look at ED attendances across multiple hospitals, it is likely that the rate of recurrent DSH would be higher still, as those patients presenting with superficial DSH wounds and similar may have attended their own local ED within the region and only been referred to our service when presenting with the burn injury. Unfortunately, it is not yet possible to accurately interrogate the HES database for such data relating to ED presentations.

To date, there has been little documentary evidence relating to recurrent DSH in patients presenting with SIB. It is accepted that recurrence rates of DSH are higher when assessed by means of patient declaration as compared with documented admissions or treatments. Pham et al described the SIB population presenting to their Californian centre, where 47% had previously attempted suicide but none with a preceding burn injury.¹⁷ A case series of Australian patients who had been identified as presenting more than once with a SIB injury focussed on detailed psychiatric interview. They described a 100% rate of borderline personality disorder in these patients and all had suffered other forms of DSH as well.³ Carroll and colleagues estimate that one in every 25 DSH patients will die by suicide within 10 years of their index presentation.²⁰

In the UK, general practitioners (GPs) are the primary point of contact with health care services. Usually, GPs are responsible for all members of a household and build a unique relationship with their patients. GPs are therefore best placed to assess patients' biological, social and psychological risks and needs. National Institute for Health and Care Excellence (NICE) is a body within the UK that provides evidence-based guidance on the most effective ways to prevent, diagnose and treat disease and ill health. In 2011, NICE issued a clinical guideline on management of patients presenting with self-harm (<http://pathways.nice.org.uk/pathways/self-harm>).²³ The main principle of the NICE guideline is that patients should be offered 'an integrated and

comprehensive psychosocial assessment of their needs and risks to understand and engage people who self-harm and to initiate a therapeutic relationship'.⁷

In line with the recent recommendations²² this holistic and comprehensive assessment should also include enquiry about physical symptoms and where feasible, physical examination of the patient to diagnose physical ill-health. NICE also recommend the offer of between three and twelve sessions of a psychological intervention. Within the UK there is a nationwide shortage of individuals trained to deliver interventions such as cognitive behavioural therapy. This may be improving secondary to the Government's commitment to expanding access to psychological therapies,³⁰ however any improvements in outcomes will take time since there is a significant lead time to train and recruit new psychological therapists and expand existing services. Whilst this mismatch exists, those at highest risk need to be prioritised and this may be facilitated with the use of risk stratification tools.^{31,32}

Conclusion

The majority (85%) of patients presenting to our service with a self-inflicted burn injury show patterns of repeated deliberate self-harm and have been admitted to an acute hospital bed following DSH prior to self-infliction of a burn. For the first time, this study provides evidence for the recurrent nature of self-harm behaviours requiring hospital admission in the population of patients who present with a self-inflicted burn injury of any severity. It remains unclear how best to manage these patients. The aim is to improve their quality of life by seeking to improve both their physical and psychological health. It is universally accepted that patients presenting with deliberate self-harm should receive a comprehensive review by a member of the psychiatric team soon after an incidence of deliberate self-harm. We believe that the focus of this review should not simply be to assess the risk the individual poses to themselves or society, but more importantly to utilise this window of opportunity to potentially intervene in a positive way that may improve the outcomes for these patients in the longer term.

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