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Clinical outcome of patients with self-inflicted burns

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ABSTRACT

Introduction: Patients with self-inflicted burns (SIB) are thought to have a longer length of stay compared to patients with accidental burns. However, other predictors for a longer length of stay are often not taken into account, e.g. percentage of the body surface area burned, age or comorbidities. Therefore, we wanted to study the outcome of patients with SIB at our burn center.

Methods: A retrospective, observational study was conducted. All adult patients with acute burns admitted to the burn center of the Martini Hospital Groningen, between January 1, 2009 and December 31, 2013 were included. Data on characteristics of the patient, injury, and outcome (LOS, mortality, discharge destination) were collected. In patients with SIB, suicide attempts (SA) were distinguished from self-harm without the intention to die (non-suicidal self-injury, NSSI). To evaluate differences in outcome, each patient with SIB was matched on variables and total score of the Abbreviated Burn Severity Index (ABSI) to a patient with accidental burns (AB).

Results: In total 29 admissions (21 SA and 8 NSSI) were due to SIB and 528 due to accidents. Overall, when compared to AB, there were significant differences with respect to mortality and LOS for SA and/or NSSI. Mortality was higher in the SA group, while the LOS was higher in both the SA and NSSI groups compared to the AB group. However, after matching on ABSI, no statistical significant differences between the SA and SA-match or the NSSI and NSSI-match group were found.

Conclusion: With the right and timely treatment, differences in mortality rate or length of stay in hospital could all be explained by the severity of the burn and the intention of the patient.

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1. Introduction

Patients with self-inflicted burns (SIB) often have extensive burns and require a lot of care and attention of a multidisciplinary burn team. Overall, patients with SIB are thought to have a longer length of stay (LOS) compared to other patients with burns [1]. Although several research papers have been published, there is no consensus on the outcome of SIB patients in terms of LOS and their mortality [2].

SIB seem culturally determined and are more common in Eastern compared to Western countries [3]. For example, incidence is reported to be 36.6% in Iran [4] and 6.8% in Switzerland [5]. In 2004, Laloe clustered the motives for SIB in three broad groups: those burning themselves because of a psychiatric illness, e.g. depression or schizophrenia (Western and Middle East countries), those doing so for personal reasons (e.g. India, Sri Lanka, Papua-New Guinea, Zimbabwe), and a small group doing so for political reasons (e.g. India, South Korea) [6]. For burns that are not motivated ideologically or attempted during an altered mental state, such as delirium or "confusion", two new psychiatric disorders are suggested by the American Psychiatric Association (APA) in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5): Suicidal Behavior Disorder and non-suicidal self-injury (NSSI) [7]. The difference between the two disorders lies in the intention of the patient to inflict burns on himself. This distinction can elucidate the debate on outcome after SIB. In addition, a shift in thinking about self-inflicted injuries is reflected in DSM-5. Mental illnesses such as depressive disorder or schizophrenia are now considered to be independent conditions and risk factors for Suicidal Behavior Disorder or NSSI [7].

LOS in burn patients may depend on whether the burns are accidental or self-inflicted [8], and the intention of the burns as patients who inflict the burns themselves often have a higher %TBSA burned [9,10]. A higher %TBSA burned and higher age are the most commonly identified significant prognostic factors for LOS [11]. In addition, % full thickness burn, female gender, inhalation injury, surgery and depth of burn are found to be predictors [11]. Furthermore, general effects of psychiatric illness/comorbidity might explain a longer LOS in SIB patients, as longer LOS is observed in general medical patients with psychiatric comorbidity [12]. Probable explanations for psychiatric patients to stay longer in hospital are sought in complications in care related to mental illness including differential diagnosis of medical disorders, treatment refusal or the need for additional psychiatric consultation or treatment [12]. Noteworthy, psychiatric illness may also trigger quicker referral or acceptance to a nursing home reducing the length of stay. Furthermore, part of these patients may have poorer hygienic habits which might influence length of stay and morbidity after burns.

Whether LOS is indeed prolonged in self-inflicted burns is not clear as many studies failed to adequately control for variables known to affect time needed for burn recovery. Thombs and Bresnick did control for several initial differences and showed no difference between psychiatric patients with self-inflicted burns compared with psychiatric patients with accidental burns in terms of mortality or length of stay [13]. Besides adjusting for a psychiatric diagnosis (yes/no), they controlled for 18 other variables. By taking a psychiatric diagnosis into their regression analyses, however, we feel they may have controlled for at least one variable too many, leaving no differences between the average group means. Overadjustment can obscure a true effect or create an apparent effect when none exists [14,15]. In view of contradictory scientific information, we aim to compare the outcome of patients with SIB (suicide attempt and non-suicidal self-injury) treated at the burn center with patients admitted with accidental burns.

2. Material and methods

A retrospective, observational study was conducted. All patients aged 18 years and older with acute burns admitted to the burn center of the Martini Hospital Groningen between January 1, 2009 and December 31, 2013 were included. The Martini Hospital is a dedicated burn centre and serves children and adults primarily from the north-eastern part of the Netherlands. Data on individual patients were retrieved from the Dutch National Burn Repository R3 and if necessary supplemented from patient's files. The Medical Ethical Committee of the Martini Hospital approved this study (MEC no.: 2012-58).

Data on patient characteristics (including psychiatric diagnoses), burn, treatment, complications (wound infection) and outcome (LOS, mortality, discharge destination) were documented. Additionally, for all patients, burn severity was calculated according to the Abbreviated Burn Severity Index (ABSI) [15]. Moreover, patients were distinguished based on intent of injury, i.e. accidental and self-inflicted with a further subdivision in suicide attempt (SA) and any other form of non-suicidal self-injury (NSSI).

2.1. *Matching procedure*

To evaluate differences in outcome, each patient with SIB was matched to a patient with accidental burns (AB). The matching procedure was based on total scores and item subscores of the ABSI which are known to have significant predictive value on mortality [5,16,17]. First, patients were matched on ABSI total score. If no representative match with the same ABSI total score was found, patients within the same ABSI category (one point higher or lower) were sought. Subsequently, patients were matched for individual ABSI item subscores that depend on %TBSA burned, age in years at time of burn, sex, presence of full thickness burns and/or inhalation injury. In addition, if multiple admissions due to accidental burn fulfilled the matching criteria, raw data were used to match more specifically within the ABSI items %TBSA burned and age. For example, an age between 21 and 40 years is categorized as ABSI-age subscore 2. And thus, if possible a patient with SIB aged 23 was not matched to a person who was 38 years old, but to a younger person who also fell within ABSI subscore 2 category for age and fulfilled all other matching criteria.

2.2. *Statistical analyses*

Retrospective analyses on a prospectively collected database were performed. Descriptive statistics on background

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