

Self-inflicted burns: attempted suicide

Queimaduras autoinfligidas: tentativa de suicídio

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A B S T R A C T

Objective: To analyze the incidence, characteristics, behavior and mortality rate of patients with self-injury by burns admitted to the Burns Centre of Brasilia, Federal District, Brazil. **Methods:** The study population consisted of burned patients consecutively admitted to the Burns Unit of Hospital Regional da Asa Norte, Brasília, Federal District, Brazil, during the period from February 2008 to February 2009. Data were obtained on admission and were prospectively recorded during hospitalization. Patients were followed until discharge or death. **Results:** During the study period, 15 cases were admitted due to self-injury burns in the Unit. The mean age was 38.0 ± 20.6 years, 66.7% of cases of self-injury burning were women. In most cases they were married, home providers and poor. The biggest reason was marital conflict. The mortality rate was 40%. The average burned body surface was $38.7 \pm 26.1\%$. Alcohol was used by 66.7% of patients to cause the burns. The average duration of treatment was 20.1 ± 14.8 days. Self-injury burned patients had more extensive lesions, remained in hospital for longer periods and had worse prognosis. **Conclusion:** Patients with self-inflicted burns had a mean higher age, higher burned body surface, longer hospitalization, more infectious complications and higher mortality rate than patients with accidental burns. These patients need constant psychiatric support, which can be helpful in preventing future episodes of self-harm.

Key words: Therapeutical approaches. Self-injurious behavior. Wounds and injuries. Suicide, attempted. Burns.

INTRODUCTION

Self-inflicted burns may mean an attempt to self-termination or be part of an ongoing process of self-immolation. There are different methods of self-harm, according to geographic region, gender and social factors¹.

Self-injury burns are infrequent, but they are a regular cause of hospitalization in burn units. In Asia (Iran, India and Iraq), the incidence of self-produced burn injuries is high, with previous reports indicating 9 to 32% of total admissions for burns. This represents a huge problem, as they are usually extensive and deep burns, and patients often have a history of psychiatric illness and difficulties in family relationship¹⁻⁴.

The objective of this study was to analyze the incidence, characteristics, behavior and mortality rate of patients with self-harm burns of a burn treatment regional center in Brazil.

METHODS

The sample consisted of 278 patients consecutively admitted to the Burns Unit of Hospital Regio-

nal da Asa Norte, Brasília, Brazil, during the period from February 2008 to February 2009. Data were collected at admission and prospectively recorded during hospitalization. Patients were followed until discharge or death.

Over 90% of patients reached the hospital within 48 hours after the burn. Patients readmitted for reconstructive operations and patients transferred from other hospitals were excluded.

Variables that were taken for analysis during hospitalization were age, gender, percentage of burned body surface, educational level, marital status, occupation, cause of burns, infections, circumstances surrounding the cause of burn, previous psychiatric history, surgical interventions (debridement and skin grafting), hospitalization and outcome.

All patients whose burns configured suicide attempt were approached by the hospital Social Services and assessment was completed. Of these, 15 were clearly recognized. Inclusion criteria were based on the patient's confession about the self-inflicted burns or reports of reliable witnesses. Patients with doubtful history were excluded.

Burned surface area (BSA) was calculated by the scale of Lund & Browder, adding percentage of the burned dermis and subdermis⁵.

Study conducted at the Hospital Regional da Asa Norte, Department of Health of the Federal District, SMHN, AE 1, Block A, 70000-000, Brasília, Brazil.

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Fluid therapy was performed in accordance with the Parkland formula and plasma was administered after the second day through a central venous access. Early debridement and grafting were performed within five days in full-thickness burns when the overall condition of the patient allowed.

Infections in all patients admitted and treated for burns were subsequently reported, according to previously defined criteria⁶. All infections were recorded from the first day of hospitalization and followed carefully. Infections were divided into three categories: bloodstream infection, pneumonia and wound infection. The diagnosis of infection in burn patients has been defined by clinical features and laboratory parameters. The criteria for infection were based mainly on the guidelines of the Centers for Disease Control (CDC), Atlanta, USA⁷.

All self-inflicted burn patients were evaluated by a psychiatrist but two, who were severely ill and were unable to provide information. The psychiatric evaluations were obtained by relatives or previous medical reports, and was based on the Diagnostic And Statistical Manual Of Mental Disorders (DSM IV)⁸.

All values were expressed as mean \pm standard deviation or as percentages. Associations between categorical variables were tested by univariate statistical methodology, with significance accepted at $p < 0.05$ (chi-square, Student's t test or Mann-Whitney test). Statistical analysis was performed using the statistical package SPSS 10.0.

This study was approved by the Ethics Committee of the Ministry of Health in Brasilia, DF, under No. 088/2007.

RESULTS

The study included 278 burn patients admitted to the Burns Unit of Hospital Regional da Asa Norte Brasilia, DF, during the period from February 2008 to February 2009. These consisted of 192 men and 86 women. The mortality rate was 5%. The average age was 24 years (range 1-82 years) and mean burned surface area (BSA) was 14% (range 1-100%). One hundred and fifty-two patients (54.7%) had flame burns, 96 (34.5%) by scalding, 25 (9%) by electricity and five (1.8%) by chemical agents. Inhalation injury was present in nine (3.9%) patients.

Two hundred and forty-five patients remained more than 72 hours in the Burns Unit and the average stay was 12 days (range 1-86 days).

During the study period, 15 (5.4%) patients had a history of attempted suicide by burning. Of these, ten (66%) were women and five (33.3%) were men. In six (40%) patients, death occurred from one to 52 days after injury, with a median survival of 21 days. The average age was 38 years, ranging between 15-65 years.

The method chosen to commit suicide was the use of alcohol in ten (66.7%) patients, followed by gasoline (three patients), and organic solvent (two patients).

The local for the attempt to self-termination was home in 73% of cases. BSA ranged from 12 to 86%, with an average of $38.7 \pm 26.1\%$. Eighty-three percent of cases were married and 53.3% were home providers.

The reasons for the suicide attempt were known in all cases. The main was marital conflict in ten (66.7%) patients, followed by depression in three (20%), political motivation and unemployment. In this group, only two patients had a positive history for alcohol or substance abuse. The most common mental disorder that led to the self-termination attempt by burn was depression followed by anxiety.

BSA was significantly higher in patients with self-termination attempt burns when compared to accidental ones. Other variables were significantly more frequent in patients with self-inflicted burns: the presence of multidrug-resistant bacteria in the wound, infectious complications and mortality rate (Table 1).

DISCUSSION

There are different methods and means of attempting self-termination. The use of fire for suicide is uncommon but not rare, but is described as low incidence compared to other means⁹.

The use of fire is among the most dramatic of all forms of suicide and has a strong cultural significance and political impact in several countries. There are references to self-injury associated with different beliefs, such as the Sati ritual in India, where widows threw themselves on the funeral pyres of their dead husbands. In more modern times, the main motivations for self-immolation are personal or family matters².

Gender and geographical distribution influence suicide methods. In Iran, most suicides are committed by young and married women, with the use of gasoline^{1,4}. This is similar in Cairo³ and in other Asian populations¹⁰.

Regarding the frequency of suicides by burning compared to other methods, this represents 11% in Zimbabwe and became the third method of suicide, after the use of organophosphates and antimalarials¹¹. In Durban (South Africa), 9.9% of all suicides were the result of self-sacrifice¹². On the other hand, in Germany, burn was much less used as a means of suicide, accounting for only 0.76% of all suicides in Berlin¹³. The meaning and interpretation of self-inflicted burns as a suicide method varied according to the country and are probably due to cultural, religious and psychological differences.

Our study revealed that attempted suicide by burning represents 5.4% of the total number of patients with burns that required hospitalization. The incidence of

Table 1 - Comparison between patients with accidental burns and patients with self-inflicted burns admitted to the Hospital Regional da Asa Norte, Brasília, DF, from February 2008 to February 2009.

	Self-inflicted N= 15	Accidental N=263	P
Age (years. standard deviation)	38.0 ± 20.6	23.2 ± 20.4	0.007
Injury by flame (% patients)	93.3%	52.9%	0.023
BSA % (mean. standard deviation) *	38.7 ± 26.1	12.2 ± 12.1	<0.001
BSA > 30% (% patients)	46.7	6.5	<0.001
Length of hospital stay (days. mean. standard deviation)	20.1 ± 14.8	11.8 ± 9.2	0.002
Multi-Resistant Bacteria in Wound (% patients)	73.3	28.9	0.001
infectious complications (% patients)**	73.3	28.5	0.001
Sepsis (% patients)	60.0	19.4	0.001
Mortality (% patients)	40.0	3.4	<0.001

* BSA = Body Surface Burned.

** Include: bloodstream infection, pneumonia and / or wound infection..

self-inflicted burns admitted to our Burns Unit correlates closely with the findings of Castelani *et al*⁹, Italy (4.4%). While in Western countries self-inflicted burns are relatively uncommon, in some parts of the world they are a major cause of extensive burns and, consequently, of deaths. The highest rates of self-inflicted burns were reported in India (40%)², Sri Lanka (25%)¹⁴, Egypt (17%)³ and Iran (14.5%)¹⁵.

In this study, most individuals who attempted suicide by burning (66.7%) were between the ages of 20 and 40 years, similar to other reports^{9,16}. These findings are perfectly understandable, since people in this age often incur different risk situations (at work, social environment and marriage) that may cause distress or an unexpected response. The suicide attempts are a path to find a way out of these situations.

Most studies revealed that family problems (partner addictions, differences in age, little understanding of the partner, bigamy, lack of interest in family), lack of affection and early marriages are the most important reasons that lead to suicide by burning, particularly among women¹⁷.

There was a male predominance among people with burns from self-termination in European countries and Far East Asia¹⁸⁻²⁰. In contrast, a female predominance was observed in this study, in most Middle Eastern countries and India. In the U.S., no gender was clearly dominant²¹.

Most patients in our study used alcohol to ignite their clothes. On the other hand, fuels such as gasoline, benzene and kerosene were the flammable liquids used in 91% of attempted suicides in Israel¹⁹, in 84.3% in Iran¹ and 60.6% in Korea²⁰.

In this study, the mean BSA was 38% among patients with self-termination attempt, while in other

countries the extent of burning in these patients was 41% in the UK¹⁶, 41% in Italy⁹, 45% in Egypt³ and 65.5% in Iran¹.

It is possible that prolonged hospitalization was due to the extent of the burn, its complications and behavioral difficulties. Possibly the combination of all these factors result in a long period of hospitalization and a slow recovery when compared with patients with accidental burning.

Death rate from self-inflicted burns was higher than in the burnt population as a whole. A high mortality rate for suicide by burning was a common phenomenon in other studies. The mortality rate of burns self-termination ranged from 14% (U.S.) 90% (India)²². In this study, 40% of the patients died. Mortality rate is lower than that found in Iran (79.6%), but similar mortality has been reported in Bulgaria (34.8%)²³, Germany (37.6%)²⁴ United Kingdom (44%)¹⁶ and Italy (38.7%)⁹. The reasons for high mortality were the extent of the burn, the presence of complicated infections and resistance to treatment in these patients²⁴. The desire to die and little collaboration make the prognosis worse. Psychiatric and psychological supports help keep the patient collaborative and thereby facilitate the work done by doctors and nurses.

The presence of psychiatric illness among patients of intentional self-injury by burning seems to be common in European countries, North America and the Middle East. Depression was the most frequent psychiatric diagnosis, followed by schizophrenia¹⁸. The association with psychiatric problems, drugs or alcohol abuse has been reported in other series²². However, interpersonal problems and marital disharmony appeared to be the main reason for self-injury by burning in Brazil, like in India^{2,22} and Zimbabwe¹¹. Political protest is the less frequent reason¹⁸. In Brazil, the ignorance about the serious, even fatal, consequences of

intentional self-burning leads to a significant proportion of these lesions, resulting in unintended deaths²⁵.

Several incidents of self-inflicted burns as a form of political protest have been reported in the press, especially in the 60's and 70's. The political motivation was found in only one patient in our series.

The primary intent to commit self-harm by burning and mutilation is attention seeking. This kind of attitude is called active-passive and can be related to the parasuicidal behavior. Active-passiveness is the tendency to approach problems passively and helplessly rather than actively and decisively. Individuals typically try to help others to resolve or manage their problems, but are passive in solving their own conflicts²⁶.

Patients with intentional self-injury by burning were older, had more extensive burns, longer hospitalization, more infectious complications and higher mortality rate when compared to patients with accidental burns. Moreover, the involvement of women was more frequent in our unit.

Special conditions are necessary in the treatment and rehabilitation program for these patients to avoid death. Patients who maintain a strong destructive intent can cooperate little with treatment and, in fact, they rarely or

never collaborate during therapy. Family support, important from the psychological point of view, is generally poor because most patients live in emotional isolation.

Furthermore, it is essential to standardize the medical, psychological, psychiatric evaluation and consultation for all patients. Early assessments can identify needs for psychiatric care, both in hospital and outpatient, after discharge from the burn unit. The team should develop a plan for coping with the potential problem behavior and the possible non-adherence to initial treatment.

The management of patients with burns caused by suicide attempt requires a multidisciplinary approach and significant medical, financial, psychological, occupational and social supports.

Patients with self-injury by burns had a mean higher age, higher burned body surface, longer hospitalization, more infectious complications and higher mortality rate than patients with accidental burns. These patients need constant psychiatric support, which can be helpful in preventing future episodes of the self-harm. The identification of populations or risk groups is of fundamental importance for a targeted therapeutic approach and prevention programs.

R E S U M O

Objetivo: Analisar a incidência, características, conduta e taxa de mortalidade de pacientes com autolesão por queimaduras internados no Centro de Queimaduras de Brasília, Distrito Federal, Brasil. **Métodos:** Os pacientes do estudo consistiram das vítimas de queimaduras consecutivamente internadas na Unidade de Queimados do Hospital Regional da Asa Norte, Brasília, Distrito Federal, Brasil, durante o período de fevereiro de 2008 e fevereiro de 2009. Os dados foram obtidos na admissão e foram registrados prospectivamente durante a internação. Os pacientes foram seguidos até a alta ou o óbito. **Resultados:** No período do estudo, foram admitidos 15 casos de autolesão por queimaduras na Unidade de Queimados. A média de idade foi $38,0 \pm 20,6$ anos; 66,7% dos casos de autolesão por queimadura eram mulheres. Na maioria dos casos eram casadas, provedoras do lar, e pobres. O maior motivo foi conflito conjugal. A taxa de mortalidade foi 40%. A área média de superfície corporal queimada foi $38,7 \pm 26,1\%$. O álcool foi usado por 66,7% dos pacientes como causa das queimaduras. A média de duração do tratamento foi $20,1 \pm 14,8$ dias. Pacientes com autoinjúria por queimadura apresentaram lesões mais extensas, permaneceram mais tempo no hospital e pior prognóstico.

Conclusão: Pacientes com autolesão por queimaduras apresentaram média de idade mais elevada, maior superfície corporal queimada, maior período de internação, mais complicações infecciosas e maior taxa de letalidade do que os pacientes com queimaduras acidentais. Esses pacientes precisam de constante suporte psiquiátrico, o qual pode ser útil na prevenção de futuros episódios de autoagressão.

Descritores: Conduta terapêutica. Comportamento autodestrutivo. Ferimentos e lesões. Tentativa de suicídio. Queimaduras.

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