# **Original Research Article**

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# Analysis of psychiatric problems in burn patients in a tertiary burn unit: a prospective study

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# **ABSTRACT**

**Background:** Burn injuries in our part of the world generally occurs in the lower socio-economic groups. A large part of these patients suffers from underlying psychiatric disorders. This study is to see the prevalence rates and clinical diagnosis of psychiatric disorders and psychosocial problems as a predisposing factor to burns and squeal to burns in our population, hence necessitate the consultation with the psychiatric team management to improve the outcome from the time of critical phase recovery to the rehabilitation phase.

**Methods:** 114 patients admitted with suicidal burns above the age of 15 years were included in the study at Dept. of Plastic, Reconstructive and Burn Surgery, Govt. Kilpauk Medical College and Hospital for a period of 2 years and evaluated.

**Results:** The patients were mostly married females in the 2nd to 3rd decade of life. Most of them had some form of pre-morbid psychopathology. 60% of patients had >50% burns and only 17% were survivors. After 1 year of psychotherapy, most patients had returned to normalcy.

**Conclusions:** In our study deformity related depression were more after recovery hence prevention of deformity with usage of appropriate splintage, wound management, early grafting and intense physiotherapy will produce a drastic change in their wellbeing and coping ability and help long term rehabilitation and return to normalcy.

Keywords: Psychopathy, Rehabilitation, Suicidal

## **INTRODUCTION**

A burn injury implies damage to or destruction of living tissue, in the overwhelming majority of cases the skin, by thermal, chemical, electrical radiation energy or combination thereof. When the skin is seriously damaged, the properties of that tissue are lost, the barrier functions destroyed, and the internal milieu is exposed to and affected by threatening surroundings. A severe burn injury, where larger areas of the skin are destroyed, is a life-threatening state, and the consequences include fluid and electrolyte imbalance, metabolic disturbances,

bacterial contamination of tissues, and complications in all major organ systems. The severity of a burn injury is a function of both the characteristics of the burn injury itself and of factors related to the individual. Such factors include the proportion of the body surface that is damaged, location of injury, depth of the injury, age at injury, presence of associated injuries, and coexisting illness, and associated psychosocial problems like poverty, low socioeconomic status, marital problems, psychiatric problems and substance abuse (alcoholism) which is more prevalent in our country.<sup>1</sup>

The treatment of burns is a long procedure that begins on the day of injury and can continue for many years or even decades. Initially, the focus is on the wounds, and surgery in its real meaning is one of the main components of treatment. But even at this early stage other elements affect recovery; on daily ward rounds many patients describe problems with nightmares and itching of the newly healed skin and scars. They feel tired and frustrated because itching or nightmares have interrupted their sleep, resulting in a lack of tolerance and motivation to comply with the strenuous and often painful rehabilitation.<sup>2</sup>

The treatment of burns injuries commences with a period of specialized intensive care during wound care and surgical treatment are carried out when necessary. Management of pain and anxiety related to the accident, and to burn care procedures such as surgery, are main challenges during this phase of care. For the severely injured, this first period is just the beginning of a long journey involving adaptation to post burn life. Rehabilitation of the patients starts on the day of injury and comprises measures that are also undertaken during the phase of very specialized and technologically focused intensive care. Active surgical treatment of wounds and scars, as well as physiotherapy and occupational therapy continue long after the patient has left the intensive care unit and are part of the process of regaining functional capacity.

Psychological and psychosocial issues are actively addressed in order to identify and treat severe co morbid psychiatric conditions such as mood disorders and depression, posttraumatic stress disorder (PTSD), and substance use disorders, and less pronounced psychological problems that may interfere with compliance to various treatment and rehabilitation measures.<sup>3,4</sup> Potential late problems include complications such as restriction in range of motion and in muscle strength, changes in appearance, psychological disturbances, and, occasionally, widespread social and environmental dislocation.

# **METHODS**

Patients admitted in the department of Plastic, Reconstructive and Burn Surgery, Govt. Kilpauk Medical College during the period of December 2009 to February 2010 were taken for the study. The total number of patients was 114.

The inclusion criteria were all patient 15 years and above were included with history of suicide. The exclusion criteria were all patients below the age of 15 as major and common psychiatric problems rarely occur in this group and those patients who were not willing for participation. Patients were assessed with a fixed set of questionnaires to diagnose pre-burn psychosocial and undiagnosed psychiatric illness. At the 5<sup>th</sup>, 30<sup>th</sup> and 90<sup>th</sup> post burn day, they were assessed by the psychiatrist for any mental

illness and managed accordingly. Burn survivor were asked to review after one year and assessed by the psychiatrist.

#### **RESULTS**

As the English say goes as "normal people seldom get burned" the psychopathological aspects of suicidal burn victims were analysed from the period of December 2009 to February 2010 in Government Kilpauk Medical College and Hospital, Department of Burns and Reconstructive Surgery. This study is necessitated due to large number of suicidal burns admitted in the second largest burns department in India and for understanding the association of various psychosocial factors in suicidal burns and analyse their outcomes.

The incidence of suicidal burns all over the world is about 4%, but in our part of the country it is 25% according to a study done in south India by Dr. R. Raja shanmugakrishnan et al in 2008. In our study the total incidence of suicidal burns accounted for 114 patients (30%) with overall 386 admissions which are more compared to the international statistics and to domestic statistics. 34 (30%) were male and 80 (70%) were female patients. Of the 20 patients who survived, 9 were male and 11 were female (Figure 1) (Table 1).

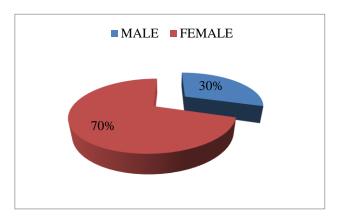


Figure 1: Sex distribution.

Table 1: Age distribution with gender incidence.

Age	Total	Male	Female
15-20	14(12%)	3	11
21-30	51(45%)	13	38
31-40	34(30%)	14	20
>40	15(13%)	5	10

On analysing age distribution, suicidal burns were more common in the 20 to 40 years of life accounting to 75% of the total burn victims, the reason being marital and social problems being more common in this age group. Marital status has a big influence in suicidal burns, 88% of them were married at the time of injury (Figure 2) and were mostly females (Table 2).

Table 2: Marital status with gender incidence.

Marital status	Total	Male	Female
Married	100(88%)	29	71
Unmarried	14(12%)	5	9



Figure 2: Marital status.

Most of them were uneducated or had only primary education accounting to 56% of burn victim and higher education seems to have a low prevalence of suicidal burns (4%) (Figure 3) (Table 3). These two factors contribute to psychosocial stress in lack of education may not provide good employment and marital commitments cause increased needs to provide for the family thus increasing stress.

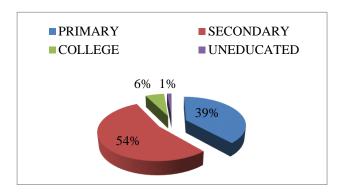


Figure 3: Educational status.

Table 3: Educational status with gender incidence.

Education	Total	Male	Female
Primary	32(28%)	12	20
Secondary	45(40%)	10	35
Collage	5(4%)	0	5
Uneducated	32(28%)	12	20

All of these patients were low socioeconomic group and considering the employment 61% were dependent and most of them were females. 34% were male un skilled labourers, indicating that women are in more social and financial stress then men as they are dependent on their spouse for their livelihood (Table 4).

Table 4: Employment status with gender incidence.

Employment	Total	Male	Female
Skilled	1(<1%)	0	1
Semi-skilled	4(4%)	2	2
Un skilled	39(34%)	27	12
Dependent	70(61%)	5	65

Feuerbach et al reported 64% psychiatric disorders, 31% alcohol abuse and 41% for dependence.<sup>2</sup> In studies by Kessler et al3 and Kriglen et al, they were 48% and 52% for psychiatric disorder, 17% and 18% for depression and 24% and 23% for alcohol abuse and dependence, respectively.<sup>4</sup>

Table 5: Incidence of pre-morbid psychopathology.

Diagnosis	Total
No psychiatric diagnosis	35
Major depression	45
GID	2
PTSD	2
Personality disorder	5
Substance abuse	19
Schizophrenia	6
Others	nil

In our study, the incidence of psychiatric disorders was 15%, for depression 39% and for alcohol abuse and dependence 17% of which alcohol was the major problem in male and depression being common in marital dispute and low socioeconomic group (Table 5).

On analysing mortality rate in suicidal burns victims, it was found to be 68%, very high compared other studies by Subrahmanyam (56.5%) in Solpur, Bilwani et al (58.26%) in Ahmadabad and Jayaraman et al (52.33%) in Chennai but less than the mortality reported by Puri et al (90.5%) in Pune.<sup>5-8</sup>

The high mortality rate was found to be related to the high percentage (68% sustained >50% TBSA) of burns, the suicidal burns victims sustain, the reason being intention to die. Among the suicidal burns patients in our study 68% were above 50% burns, 24% were 25-50% burns and only 8% were less than 25% (Table 6).

**Table 6: Percentage of burns distribution in victims.** 

Percentage	Total	Male	Female
<25%	9(8%)	5	4
25-50%	27(24%)	7	20
>50%	78(68%)	22	56

Among the cases total no of survivors were 19 patients among which 8 were male patients and 11 were female patients (Figure 4) (Table 7).

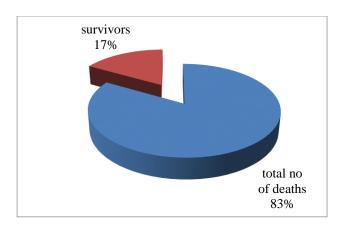


Figure 4: Incidence of survivors.

**Table 7: Survivor incidence with gender prediction.** 

Cases	Total	Male	Female
Total cases	114	34	80
Survivors	19	8	11

On analysing the incidence of acute psychiatric problems in hospitalized suicidal burn victims, depression was a major problem with 50% within a month and 26% in three months when compared to Fauerbach et al varying from 2% to 53%.2 This was more common in female patents. Withdrawal accounted to 19% and all of them were male survivors with less than 25% TBSA. Acute stress disorder accounted for 12% in this study and it was less compared to 18% to 26% in Greek, US and Dutch samples. Post-traumatic stress disorder (PTSD) in our study was 11% when compared to 15% to 20% Dutch and Greek samples PTSD was seen in patients who survived >40% TBSA in our study. Among the 19 survivors 50% of them developed depression (8 cases), 19% had preexisting schizophrenia and continued no new case was reported, 19% had withdrawal particularly male patients and 12% developed acute stress disorder (2 cases) (Figure 5).

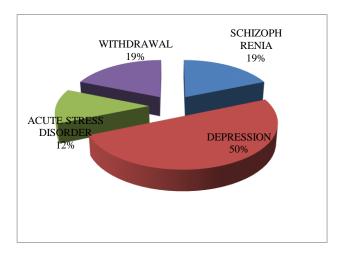


Figure 5: Acute phase psychiatric illness in survivors within one month.

On analyzing, 5 patients were lost to follow up. In the remaining 14 patients, 9 patients (48%) of them returned to their normal life style and 3 patients (16%) of the patient was afraid avoidance and they never went back to cook or even lit sacred fire in temple. 3 patients (16%) had residual depression the reason being all 3 patients under went repeated surgery for contractures, and 2 patients were continuing treatment for schizophrenia (Figure 6, 7).

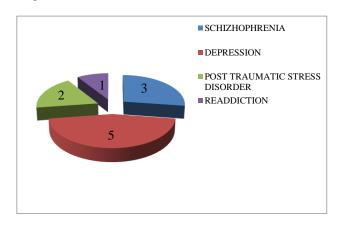


Figure 6: Psychiatric illness after 1 to 3 months of survival.

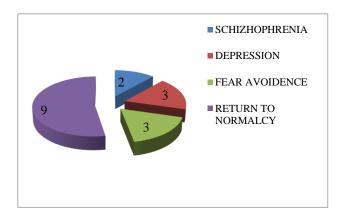


Figure 7: At one year follow up.

#### DISCUSSION

The incidence of burn injury varies greatly in different regions and countries throughout the world as a result of both economic and social factors. Burn related problems in third world countries are thus both greater and different from problems encountered in the western world.

Mechanisms of injury also vary widely among different countries and communities depending on factors like the way food is prepared, heating system, industrial environments and general living conditions. Males are strongly over-represented in burn statistics all over the world with India as the only exception; children are also at high risk, both in developed and in less developed countries. Psychosocial factors are clear risk factors for

burns. The risk factors leading to individuals to burns are lower socioeconomic groups, financial loss, unemployment, illiterate, marital disputes, extremes of age groups (geriatric), sexual abuse, rape, substance use disorders and alcoholism, illnesses like diabetes, epilepsy, chronic disability, chronic pain, cancer and pre-existing psychiatric illness like depression and PTSD.

Psychiatric disorders have been reported to be 28% to 75% of all burn patients. In a study from 2003, Patterson et al observed that burn patients had higher psychological distress than a non-burned normative sample, even after excluding those with a formal pre-injury psychiatric diagnosis. Self-inflicted burns account for about 4% of burn injuries worldwide (Horner BM et al), incidence is 25% according to a study done in south India by Dr. R. Raja Shanmugakrishnan et al in 2008 with wide variations from 0.4 to - 25% and there are indications that the numbers are increasing. 1,10

The goal of rehabilitation efforts after a major burn is to support the natural adaptation process in order to obtain as good an end result as possible in the widest sense. WHO has chosen to include the concept of rehabilitation in its International Classification of Impairments, Disease and Handicaps. A strict definition was produced by a WHO expert Committee in 1981, and is as follows: Rehabilitation includes all measures, aimed at conditions, and at enabling the disabled and handicapped [person] to achieve social integration. Rehabilitation aims not only at training disabled and handicapped persons to adapt to their environment, but also at intervening in their immediate environment and society as a whole in order to facilitate their social integration. A burn trauma exposes the individual to significant physical, psychological and social demands. In follow-ups 14 to 24 months after injury, about 90% of patients report physical complaints, with reactions from scars, pain, pruritus, heat sensitivity and loss of strength being the most common. Psychiatric morbidity during the adaptation phase during the immediate post-burn phase, cognitive changes such as delirium and transient psychotic reactions may occur, usually as a result of infections, alcohol withdrawal, metabolic complications, or high doses of drugs. It was found that symptoms of depression and anxiety generally occurred together, with prevalence rates between 25% and 65% one-year post burn, and that most symptoms subsided after that period.

A central measure of adaptation and reintegration into the community is return to work. Return to work is a definite turning point for an afflicted individual and requires certain physical and emotional strengths, but it is also a measure of basic health that can be compared between different groups. Other factors like socioeconomic background, general education, the individual's occupational training, and the current business cycle in society are also of importance. On average 58% of the men and 35% of the women were working, and also that

those who were working had significantly better perceived health.

Most burn patients develop pruritus, or itch, during the rehabilitation phase, with a reported incidence as high as 87 % after discharge from hospital according to Vitale M et al.11 For some individuals, pruritus is the dominating health complaint after severe burn injury. Pruritus seems to be most severe in partial thickness burns; it peaks at one to two weeks, i.e. during the time period when most wounds are healing, and diminishes gradually thereafter. Rebuilding of the skin continues for an extended time period, and pruritus has previously been said to persist up to 18 months after the burn. The currently accepted view is that central mechanisms, direct effects of stress hormones, activation of pain-inhibitory systems and conditioning of behaviour are all involved and should be considered in the treatment of prolonged problems with pruritus.<sup>11</sup>

In a study from the US by Fauerbach et al, at the time of discharge from hospital four out of 95 patients (4%) were diagnosed with an ongoing major depression.<sup>2</sup> A number of possible risk factors for post-burn depression have been examined with conflicting results, probably as a power. result of poor statistical Pre-morbid psychopathology was not related to symptoms of depression in the studies by Tedstone et al and Williams and Griffiths, whereas Fauerbach et al reported that preburn affective disorder was significantly related to postburn affective disorder which is in agreement with general trauma literature.<sup>2,12,13</sup> In a study by Madianos et al, face disfigurement was significantly associated with the presence of psychiatric morbidity, at least during acute hospitalisation.<sup>14</sup> In a study of psychosocial adjustment five years after burn injury, significantly more patients with disfigurement on the hands or face reported symptoms of depression as compared to those with no visible burns.

The prevalence rates of PTSD in adult burn populations varied between 31 % and 45 %. In more recent studies using self-report instruments, frequencies vary between 2 % and 26% within the first month post burn and between 13 % and 33 % at the 12-month follow-up. Using the SCID-I methodology, Fauerbach et al reported a prevalence of 8 % at discharge from hospital and 20 % at the 12-month follow-up. 15 Not unexpectedly, the figures for sub-threshold PTSD after burn injury are higher than those reported for full PTSD A high co morbidity between PTSD and depression has been described both in burn patients and other trauma populations and questions have been raised regarding whether PTSD and depression are separate disorders in the aftermath of trauma or part of a single general traumatic stress construct. The risk factors for developing PTSD after a burn injury have been addressed by several studies. Fauerbach et al found that pre-burn affective disorder, but not anxiety disorders, increased the risk of post-burn PTSD.<sup>16</sup> In another study, cosmetic disfigurement was related to the manifestation

of PTSD symptoms of avoidance and emotional numbing in females injured by burn. Furthermore, personality traits have been related to PTSD after burn. A study by Fauerbach et al indicated that neuroticism was higher, and extraversion was lower in patients who developed PTSD compared with those who did not develop PTSD.<sup>16</sup> Scandinavian personality theorist, Henrik Sjöbring postulated three personality variants which he labelled Validity, Stability and Solidity. Partly based on the theories of Sjöbring, as well as on other theories on biologically based dimensions of personality, Daisy Schalling developed the Karolinska Scales of Personality (KSP).<sup>17</sup> The KSP were primarily designed for the purpose of operationalising and measuring constructs vulnerability for different psychopathology. Recently, the KSP was subjected to further revision and development, thereby reducing the number of items and improving psychometric properties. Since the revisions were extensive, the new instrument was renamed the Swedish universities Scales of Personality (SSP). Furthermore, personality traits have been suggested to have an important impact on long-term physical and psychological outcome as well as on the use of healthcare after burn injury.

Coping is a complex process that is not so easily defined. The theory by Lazarus describes coping as a psychological process that is an ongoing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person.

The concept of fear-avoidance originally evolved from pain research and represents fear of experiencing pain and avoiding situations that are associated with possible painful experiences. It has been shown to be related to poorer physical performance and self-reported disability. In a sample of burn patients, Willebrand et al found that fear-avoidance was related to poorer self-rated health and longer sick leave. <sup>18</sup> In this context fear-avoidance was adapted to the burn situation and referred to fear of reinjury or harm instead of pain.

# **CONCLUSION**

Compared with the general population, burn patients have a high rate of pre-morbid psychopathology. Patients with pre-existing psychopathology typically cope with previously hospitalization through established dvsfunctional and disruptive Prior strategies. psychopathology can have an adverse impact on outcomes, including longer hospitalizations and the development of more serious psychopathologies after injury. In our study alcohol abuse and marital disputes were the main contributors for the pre-existing psychopathology of our patients. Patients should be encouraged to cope with the frighteningly unusual circumstances of the intensive care unit through whatever defenses are available to them, even primitive strategies such as denial and repression. Supportive psychological

interventions should focus on immediate concerns, such as sleep, pain control, and protecting patients' coping strategies.

Early identification of pre-morbid psychopathology, management of acute stage psychiatric problems, proper counseling of patient and their nearest family members, deformity prevention by various methods mentioned above, intense deaddiction programme and prevention of relapse and psychiatric evaluation of all suicidal burns patients will ensure better functional outcome. When addressed properly we can improve the survival rate of suicidal burn victims and return them to normalcy at the earliest.

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