

Post-traumatic stress disorder in patients with acute burn injury

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Abstract

Objective: To determine the risk of PTSD in patients with acute burn incidents.

Method: This was an observational prospective cross-sectional study conducted in admitted patients in Burns Ward of Civil Hospital, Karachi during a period of 6 months from January 1 to June 30, 2011. Data was collected through questionnaire having socio demographic variables and the Impact of Event-Scale (IES-R) was used to determine the risk of PTSD.

Results: Out of 145 patients, 12 (77.3%) were at risk of PTSD with 75 (66.9%) males and 37 (33%) females. Out of these 112 cases, 50% belonged to age group 16-29 years. All burn patients with more than 60% total body surface area (TBSA) involved in injury were at risk.

Conclusion: The study reports an astronomic number of burns patients with PTSD risk. PTSD drastically affects the quality of life. The earlier this disorder is diagnosed and assessed; better chances are there for enhanced treatment and better recovery.

Keywords: Post traumatic Stress disorder, Impact of Event Scale-Revised, IES-R, Burns. (JPMA 63: 888; 2013)

Introduction

Post-Traumatic Stress Disorder (PTSD) is a psychiatric disorder that arises following exposure to perceived life-threatening trauma.¹ According to the American Psychiatric Association, a person's response to the event must involve an intense emotional response that results in social or occupational impairment.²

Economically, PTSD has caused far reaching complications as well. As of 2005, more than 200,000 US war veterans were receiving disability compensation for this illness, for a cost of \$4.3 billion. This represents an increase of 149% in the amount of disability benefits paid compared to those numbers five years earlier.³

Burn injury has occupied an inimitable role in the trauma literature, frequently correlated with agonizing pain, mental stress, extended admittance in hospitals, distance from family, permanent amputations, contracture formations, all of which contribute to the enhancement of the stress on the patient.

Incidence of burn injury homicidal has always been astronomical in the Indo-Pak region, where the incidence for emergency visits of burn patients is about 76.3 per 100 000 inhabitants, 17 for hospitalization and 0.3 for emergency department deaths.⁴ In a study it was reported that 10.9% of the total admissions in Khyber

Teaching Hospital of Peshawar was due to burn injuries.⁵

In fact, Cobb and Lindemann in 1943 laid the foundation of the idea that burn injury could have mental health consequences.⁶ In a decisive evocative study, they depicted dissociation, re-experiencing, avoidance, and acute grief in those people hospitalized for burns following the Coconut Grove fire.⁶

More recent studies have documented that up to 45% of adults who were hospitalized for their burn injury had high-level PTSD after 12 months.⁷

A number of screening instruments have been developed to identify patients with PTSD, such as DSM-IV-TR, ICD-9 and more recently the Impact of Event Scale -Revised (IES-R)(Weiss & Marmar, 1997), widely used as a measure of stress reactions after traumatic events. The IES-R is a self-administered, 22-item questionnaire based on three clusters of symptoms as indicators of posttraumatic stress disorder divided as Intrusion, Avoidance and Hyper-Arousal.

In various studies it has been shown that the IES-R, "is a useful measure of stress reactions after a range of traumatic events, and it is valuable for detecting individuals who require treatment."⁸ Since the diagnosis of PTSD can only be established more than one month after the traumatic event, simple tools are needed to screen for its symptoms so they can be treated well in advance.

In this study we have used a simple IES-R questionnaire to

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identify the range of emotions and inhibitions felt by patients with acute burns injury, and see the prevalence of symptoms of PTSD before it is diagnosed.

Methods

This cross-sectional descriptive study was conducted at the Burns Ward of Civil Hospital, Karachi over a period of 6 months from 1st January to 30th June, 2011. Initially, the OpenEpi determined the sample size to be 246 by the use of hypothesized proportion of 20% as reported by Madianos et al in Greece.⁹ Subjects from either gender with ages above 16 were included in the study. However, only 159 patients were admitted at our setting during our study duration in accordance with the inclusion criteria, thus the study population reduced to 159 individuals. All patients included were within the first week (7 days) of their stay in hospital. A pre-tested questionnaire having socio demographic variables of patients like Age, Gender, Marital status, education, TBSA (total burnt surface area) and IES-R (Impact of Event Scale-Revised) was used to collect the data.

The IES-R (Weiss & Marmar, 1997) is a self-administered, 22-item questionnaire based on three clusters of symptoms as indicators of posttraumatic stress disorder. Scale is divided into three sub-scales Intrusion, Avoidance and Hyper-Arousal. Score above 20 for any of the scale indicates High-level PTSD. Informed written consent was obtained from all participants. The questionnaire was translated to Urdu language using Google translator. It was further reviewed by all authors, and was approved as being standard and uniform, without any bias.

The data was entered and analyzed on SPSS version 16.

Frequency and percentages were calculated for qualitative variables whereas means, standard deviations were calculated for quantitative variables. P-values were calculated to determine the significance of the data (using Pearson Chi Square Test). The test was applied on first two highest results to see any significance in association of these. Therefore the condition of the application that not more than 20% should be less than 5 does not apply here.

Ethical Review

The Ethical Review Board of Dow University of Health and Sciences approved the study [Ref. No: DUHS/DR/2011/-79].

Results

Overall, we selected 159 patients who fulfilled our inclusion criteria. However, 14 patients didn't respond satisfactorily, giving us the response rate of 91.1% (n=145).

Out of these 145 patients, 99 (68.3%) were males while 46 (31.7%) were females. Majority belonged to age group 16-29 years (n=73/145, 50.3%) followed by 30-39 years (n=49/145, 33.8%). Majority (n=84/145, 57.9%) were married and a significant majority was illiterate (n=72/145, 49.6%) (Table-1).

Major cause of burn was accidental (n=114/145, 78.6%), followed by homicidal causes (n=31/145, 21.4%). Most of the cases had burn injury with less than 10% total body surface area (TBSA) involved (n=48/145, 33.1%), followed by injury with 10-20% TBSA (n=45/145, 31%).

The results were also analyzed for IES-R subscales. According to it, 55.2% (80/145) met the cut off value for all

Table-1: IES-R Assessment in relation to Demographic variables.

	PTSD Risk	IES-R Assessment Partial PTSD Risk	High risk for PTSD	Total	P-Value
Frequency	25	8	112	145	
Age groups					
16-29 years	11	6	56	73	<0.838
30-39 years	9	2	38	49	
40-49 years	3	0	12	15	
50-59 years	2	0	4	6	
60 or above	0	0	2	2	
Marital Status					
Married	19	3	62	84	<0.081
Unmarried	6	5	50	61	
Educational Status					
Illiterate	16	6	50	72	<0.323
Primary	5	2	31	38	
Matriculation	4	0	25	29	
Intermediate or above	0	0	6	6	

Table-2: IES-R Assessment in relation to Total Body Surface Area (TBSA) burnt.

TBSA	IES-R Assessment			Total	P-value
	PTSD Risk	Partial PTSD Risk	High risk for PTSD		
Less than 10%	11	4	33	48	<0.245
11%< - 20%	11	2	32	45	
21%<- 40%	3	1	36	40	
41%<-60%	0	0	2	2	
61% or higher	0	1	9	10	
Total	25	8	112	145	

Table-3: IES-R Assessment in relation to gender.

IES-R Assessment	Gender		Total	P-Value
	Male	Female		
No Risk for PTSD	18	7	25	<0.812
Risk for Partial PTSD	6	2	8	
High Risk for PTSD	75	37	112	
Total	99	46	145	

the three subscales. For Intrusion subscale, 68.9% met the cutoff value (Mean 2.5 ± 1.2), out of which, 98% were likely to suffer from PTSD.

For Avoidance subscale, 61.3% met the cutoff value (Mean 2.2 ± 1.0). All of them were at risk for PTSD. Similarly, for Hyperarousal subscale, 66.9% met the cutoff value (Mean 2.3 ± 1.2) and all were at PTSD risk.

The results were also correlated for PTSD with age, marital status, literacy rate, cause of burns and total body surface area (TBSA). (Tables-2 and -3).

Out of 145 patients selected, 112 (77.3%) were found to have a likelihood of developing post-traumatic stress disorder (PTSD).

Regarding correlation of gender with PTSD, 75 (66.9%) out of 112 cases were males while 37 (33%) were females [$p < 0.812$]. Out of the overall 99 males involved in the study, 75.75% ($n=75/99$) were at risk for PTSD while in overall 46 females involved, 80.4% ($n=37/46$) were at risk.

According to the analysis, 50% out of the 112 cases belonged to age group 16-29 years, followed by age group of 30-39 years (33.9%) [$p < 0.838$]. Regarding causes of burn in correlation with PTSD, 85 (75.9%) were burnt due to accidental causes, while remaining 25 (24.1%) were burnt due to homicidal attempts.

Regarding TBSA, among the 112 high-risk patients, majority were with 20-40% TBSA or more. A significant finding of our study was that all the cases with TBSA 61% or above were found to have symptoms indicating PTSD-risk.

Discussion

Though a number of psychological complications develop as a result of burn injuries, the current study focuses on PTSD as a result of burn injuries. As mentioned earlier, studies did indicate significant risk of PTSD with burn injuries; our patient population also expressed a number of features akin to PTSD. Hence, a scale was applied, data was collected and results were produced. The main aim of our study is to highlight the magnitude of PTSD symptoms.

The Impact of Event Scale (IES) was developed by Horowitz, Wilner, & Alvarez in 1979. It is one of the most widely-used self-report measures within the trauma literature and evaluates the degree of distress a patient feels in response to trauma. It was further made more effective according to the DSM criteria by Weiss and Marmar in 1997 and was named Impact of Event Scale-Revised (IES-R).

A study where IES-R was administered patients after Myocardial Infarction; it reported 16% patients with significant symptoms of PTSD.¹⁰

Our study reports a significant majority (77.3%) of the burn injury patients to suffer from symptoms indicative of PTSD, which includes 69% such patients whose values were high enough to indicate PTSD with immunosuppressive effect. Thus, our results show that burns lead to psychological disturbances that may lead to suppression of immune system in majority of the victims.

A study from Australia showed high levels of distress during a major brush fire to be more strongly associated with PTSD symptoms than were socio-demographic or pre-exposure psychological variables.¹¹

Though little is done with the context of patients sustaining burn injury, PTSD has been found nominal in such patients. A study conducted in Seattle on patients with burn injuries reported post-traumatic stress disorder in its complete form present in 30% of patients, while a partial form of PTSD in 63% of the remaining patients.¹²

Thus, we report the risk of PTSD in our population to be significantly high at 77.3%.

We also reported that a significant majority of the patients with PTSD-risk belonged to age group 16-29 years (50%) followed by 30-39 years (33.9%). This is the age group where people have to face the hardships of obtaining the basic necessities of life.

People in this age are either unmarried or are newly married with young children. Incidents like burns which are life-threatening have a deep-impact on their lives. Many of the burn patients have to undergo amputations. Many of the women who are involved have their faces burnt. Burn incidents especially those involving face disfigurement are life-ruining set-backs for females who are young and unmarried.

A study from Greece reported 20% of burn injury patients to suffer from PTSD even after one year of the incident.⁹ This study also reported that extent of burns is not so important in relation to face disfigurement from the point of risk of developing a mental disorder. Similarly, a study from Japan revealed that the degree of cosmetic disfigurement is directly in proportion to the manifestation of PTSD symptoms in female burn patients.¹³

One of the cases that we report here was of a male 35 year old patient whose daughter died in the same accidental burning incident. Similarly, a married 29 year old female attributed with risk of high level PTSD had her mother-in-law died in the same incident that she got injured.

We also report 7 cases of burn injuries where the causes of burn injuries were intentional burning of the bodies during religious practices. All 7 cases did not show any symptoms of PTSD and agreed that they will continue to practice such religious observations.

Majority of our cases included males. Females formed only one-third of the cases, majority of which were accidental cases of burning in kitchen.

Burn injuries in males accounted from reasons ranging from electrical, chemical, homicidal or accidental fire-burns during religious processions.

Total body surface area involved has been reported as one of the factors determining the level of development of post-traumatic stress disorder.¹⁴

Our study reported all the cases with TBSA greater than 60% were at risk of high-level PTSD, while 90% of those with TBSA ranging from 20-40% had a risk of PTSD. Thus, the TBSA involved seems to be directly proportional to

level of PTSD encountered.

Patterson et al reported in their study that the increasing incidence of PTSD is preventable if proper psychological treatment sought at the right time.¹²

Moreover, a study claims that the symptoms of PTSD does not only manifest in in-hospital patients but continue to be recounted in patients after their period of hospitalization with an incidence of 40.0% at 6 months and an incidence of 45.2% at 12 months after discharge from the hospital.¹⁵ This shows a debilitating condition which will subsequently lower the quality of life experienced by such patients sustaining burn injuries.¹⁵

Due to large number of potential participants in each study population, as an important limitation, this study has only focused on registered patients in burn center of the hospital. Non-registered patients including those in other departments and wards of hospital such as out patients, emergency or traumatic departments are not entertained in this study. Therefore there is a need to develop further studies in this regard that embrace a wider subject area.

Research studies should focus to develop interventions for patients with PTSD risk during their period of hospitalization.

Conclusions

The high frequency of post traumatic stress disorder encountered in patients with burn injury is a dawning comprehension in a series of wary clinical management. Greater TBSA, gender as female population and age as adolescence are predisposing factors associated with PTSD risk. Symptoms of avoidance and hyperarousal are more evident in this disorder.

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