

Burn Outcomes Evaluation for Patients with Facial Trauma in the Emergency Department in Iraq

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Abstract: In this study, which aimed to examine the management and outcomes of burn injuries associated with facial trauma among patients treated in emergency rooms in Iraq, demographic variables, injury methods, surgical interventions, and psychological impacts were identified to shed light on the challenges facing this patient population. This study adopted a retrospective study methodology that analyzed patient records, focusing on injury patterns, treatment protocols, and outcome trends. Data collected regarding age, gender, cause of burns, treatment modalities, and psychological assessment allowed for an in-depth analysis of outcomes based on a variety of factors. A total of 115 patients from Iraq were recruited from several different hospitals. The results showed a higher incidence of thermal burns, particularly among younger age groups and those from lower economic classes. It also showed that those with facial burns had longer hospital stays and often required complex surgical treatments. More importantly, these patients exhibited a high degree of psychological distress associated with their injuries, highlighting the need for integrated care for physical and psychological recovery. In short, the study highlights the complexities of facial burn severity, psychological consequences, and the need for a multidisciplinary approach to treatment.

Keywords: Patients, Facial, Trauma, Emergency, Burns, Superficial, Thickness, Deep Tissue, TBSA.

INTRODUCTION

Burn injuries cause considerable health problems across the globe and cause grievous morbidity and mortality worldwide, and this is especially felt in conflict-afflicted regions with little or no healthcare for the injured. The casualties resulting from violent conflict in Iraq have increased the propensity among patients to sustain burn injuries. The incidence of facial burn injuries has also dramatically increased in this regard. The mechanisms of injury include thermal burns and chemical and electrical burns, which pose unique challenges to medical professionals when the complexity of care is considered. Psychological trauma from an actual burn injury coupled with that from the resulting disfigurement makes burn management protocols imperative (Ellison, D.L., 2013; Jeschke, M.G. & Herndon, D.N., 2014).

Facial burns are undoubtedly the most concerning type of burn injury as they endanger physical trauma to the body and impact socio-psychological well-being in patients (Vivó, C. *et al.*, 2016). Most of these injuries will end with long extended hospital stays with surgical procedures such as debridement, skin grafting, and even reconstructive surgeries. More than that, psychological distress that may arise from the

nature of the facial injury can lead to long-standing psychological sequelae, necessitating treatment that involves both medical and psychological rehabilitation (Choi, M. & Panthaki, Z.J., 2008; Mertens, D.M. *et al.*, 1997).

Moreover, in the context of emergency care in Iraq, the assessment and management of burn injuries, especially those associated with facial trauma, becomes an even more important landmark. Patients have varying degrees of severity, so burns are rated as first, second, third, and fourth degrees. Each of these categories has its own meanings in terms of treatment strategies and expected outcomes (Mousa, A. *et al.*, 2016; Greenhalgh, D.G., 2020). Thus, first-degree burns usually require little or no intervention, whereas deeper extensions of injury require more extensive procedures and longer recovery times. Hence, the knowledge of the types and classifications of burns in patients helps delineate focused treatment plans as well as enhance recovery pathways (Friedstat, J.S. & Klein, M.B., 2009).

There is no possibility of leaving behind the psychosocial dimensions in the recovery of burn injuries. Individuals with burns on their faces tend to have anxiety disorders, depression, and a poor

quality of life (Arno, A. *et al.*, 2012). The change that occurs in the psychological status because of disfigurement leads to seclusion and impotence in reentry into society; hence, it becomes a larger burden of injury (Leon-Villapalos, J. *et al.*, 2008). In such a situation, this study, therefore, incorporated the evaluation of the quality of life outcomes based on a standardized burn questionnaire developed for larger implications on the well-being of the patient and satisfaction with the quality of care received (Yildirim, R. *et al.*, 2023).

Age, gender, socioeconomic status, and educational level, among others, count as critical demography in burn outcomes. Young patients or those suffering from greater total body surface area (TBSA) burns usually have poorer prognoses and more complicated recovery routes. The study intends to analyze these variables in trying to ascertain their impact on recovery and quality of life scores after trauma (Bujang-Safawi, E. *et al.*, 2010).

Indeed, a sound mode to evaluate and redress burn outcomes is needed in view of the critical need to improve healthcare practices in areas affected by conflict. The knowledge gained will certainly enhance burn care in Iraq and help therapeutic health teams with specific rehabilitative strategies to be applied on affected individuals (Brazier, J.E. *et al.*, 1992).

This study is aimed at assessing the burn outcomes in patients evaluated in the emergency department of Iraq with facial trauma (Bunevicius, A., 2017). Even though studies have been done elsewhere concerning burns, it is surprising that no country-specific literature exists with regard to the outcome of face burns in Iraq. This realization creates discomfort since localized studies will give contextually sensitive findings that lack generalizability to various populations or health systems. This study will systematically record category demography, modes of injury, surgical procedures done, and outcomes with the aim of adding information to the current body of literature.

MATERIAL AND METHOD

Study Design

This study was a backward cohort study designed to analyze patient outcomes following facial trauma due to burn injuries within an emergency room setting in Iraq. The assessment allowed for six months of follow-up, giving sufficient time for

evaluation of immediate and late outcomes concerning surgical interventions.

Study Population

The adult patients aged 18 years and above and coming to the emergency department with facial trauma due to burn injuries from January 2024 until February 2025 were enrolled in the study. All patients were considered for eligibility according to the inclusion criteria, which covered the presence of either the first, second, or third burns requiring surgical intervention or fourth-degree burns.

Data Collection

Data on the demographics, i.e., age, height, weight, body mass index (BMI), education level, income status, smoking history, and sex were collected for all subjects. Information about the mechanism of injury, total body surface area (TBSA) involved, burn classification, and surgical interventions was also recorded.

Outcome measures were classified into several structured tables addressing classifications of burns, surgical outcomes, postoperative complications, rehabilitation, and follow-up assessments. The quantitative measures targeted the quality of life and general health status among the subjects by means of a standardized burn questionnaire, which was applied in a pre-treatment, post-treatment, and six-month follow-up fashion.

Patients underwent different surgical interventions, including debridement, skin grafting, and flap surgery, based on the severity of the burn and other associated injuries. The outcome in question was then classified according to the percentage of improvement with respect to each procedure.

Statistical Analysis

Descriptive statistics were used to summarize demographic and clinical characteristics of patients. Continuous variables are presented as mean \pm standard deviation (SD), while categorical variables are presented as frequencies. An OR analysis evaluated risk factors for poorer outcomes; for this, the authors utilized logistic regression, using age, TBSA, smoking status, and burn classification to assess significance.

With paired t-tests, quality-of-life scores collected from the burn questionnaire were subjected to comparisons to find out statistically significant differences over the treatment phases. A p-value of <0.05 was considered as statistically significant.

ETHICAL CONSIDERATIONS

The research ethics in the study protocol were ensured through institutional review board (IRB) evaluation and approval for the study. Informed consent was obtained from participants or from the participants' legal guardians, thereby ensuring privacy and confidentiality in accordance with ethics governing clinical research.

LIMITATIONS

Retrospective nature of the investigation is one of several limitations since sometimes, because of the incomplete records or self-reported measures, bias takes place. Moreover, the sample size is probably not generalizable enough for other populations. Further resourceful studies may concentrate on multicenter designs for improved diversity.

RESULTS

Table 1: Demographic Results of 115 Iraqi patients in the Emergency Department in Iraq

Demographic Factor	Results
Age (Mean \pm SD)	35.4 \pm 12.3
Height (Mean \pm SD)	175.2 cm \pm 8.4
Weight (Mean \pm SD)	78.1 kg \pm 15.6
BMI (Mean \pm SD)	25.4 \pm 4.5
Causes of Burns	
1. Thermal	60 patients (52.2%)
2. Chemical	25 patients (21.7%)
3. Electrical	10 patients (8.7%)
4. Fracture with Burn	20 patients (17.4%)
Education Level	
- High School	30 patients (26.1%)
- College	50 patients (43.5%)
- Graduate	35 patients (30.4%)
Income	
- >\$1000	55 patients (47.8%)
- <\$1000	60 patients (52.2%)
Smoking Status	
- Yes	40 patients (34.8%)
- No	75 patients (65.2%)
Gender	
- Male	60 patients (52.2%)
- Female	55 patients (47.8%)

Table 2: Distribution of Patients According to Classification of Burns

Classification of Burns	Number of Patients
First Degree (Superficial)	20
Second Degree (Partial Thickness)	50
Third Degree (Full Thickness)	30
Fourth Degree (Deep Tissue)	15

Table 3: Evaluation of Overall and Related Results

Total Body Surface Area (TBSA)	Severity of Burns	Number of Patients
<10%	Minor	10
10%–20%	Moderate	30
21%–30%	Severe	40
31%–40%	Critical	20
>40%	Life-Threatening	15

Table 4: Mechanism of Injury

Mechanism of Injury	Number of Patients
Thermal Burn	60
Chemical Burn	25
Electrical Burn	10
Fracture with Burn	20

Table 5: Full Outcomes of Surgical Intervention

Surgical Intervention	Outcomes
Debridement	70% improved
Skin Grafting	80% improved
Flap Surgery	90% improved

Table 6: Outcomes Postoperative according to ICU, LOHS, LOS

Outcome	Number of Patients
Admission to the Intensive Care Unit (ICU)	25
Length of Hospital Stay (Days)	12.5 ± 3.2
Length of Stay (Days)	10.0 ± 2.5

Table 7: assessment outcomes of patients according to Complications during Hospitalization

Complications	Number of Patients
Infection	15
Surgical Site Complications	10
Other Complications	5

Table 8: Rehabilitation Needs Post-discharge

Rehabilitation Requirement	Number of Patients
Physical Therapy	50
Occupational Therapy	30
No Rehabilitation Needed	35

Table 9: Follow-up Outcomes (Six Months Post-discharge)

Outcome	Number of Patients
Full Recovery	70
Partial Recovery	30
No Improvement	15

Table 10: Logistic Statistical Risk Factor

Risk Factor	Odds Ratio (OR)
Age > 40	2.1
TBSA > 30%	3.8
Smoking Status (Yes)	1.6
Severe Burn Classification	4.5

Table 11: Comparative Assessment of Patients' Life Scores According to Burn Questionnaire

Variable	Pre-treatment Score (Mean ± SD)	Post-treatment Score (Mean ± SD)	Six-Month Follow-up Score (Mean ± SD)
Overall Quality of Life	55.2 ± 12.7	72.1 ± 10.9	78.5 ± 8.9
Physical Functioning	50.4 ± 11.3	68.3 ± 9.2	75.0 ± 7.6
Emotional Well-being	57.8 ± 13.5	74.5 ± 11.1	79.3 ± 6.8
Social Functioning	53.1 ± 12.1	70.4 ± 10.0	76.5 ± 8.4
Pain and Discomfort	45.7 ± 14.2	62.5 ± 11.5	68.0 ± 8.1
Self-Care Ability	52.9 ± 13.8	69.2 ± 10.3	74.8 ± 7.5
Satisfaction with Care	48.2 ± 15.0	71.6 ± 12.0	77.7 ± 9.3
Re-integration into Society	49.5 ± 14.4	65.4 ± 8.6	71.1 ± 8.0

DISCUSSION

The findings from this study demonstrate the comprehensive nature of managing and treating burn injuries with facial trauma in emergency departments in Iraq by outlining factors affecting their particular situation and recovery. This study reinforces the concept that burn care is

multidimensional, whereby demographic factors, mechanisms of injury, operative interventions, and psychological ramifications interact to influence an individual's recovery profile. This study also revealed that facial burns can be medically and technically challenging and carry great psychosocial implications for the patient, all of

which warrant an integrative approach to care (Montazeri, A. *et al.*, 2003; Snaith, R.P. & Zigmond, A.S., 1986).

One of the key findings of this research is that burn injuries caused by thermal sources are highly prevalent, being the majority of cases (Hutter, M.F. *et al.*, 2022). This concurs with the literature, which states that scald and flame injuries are prevalent in conflict settings and economically disadvantaged regions (Smolle, C. *et al.*, 2022). The predominance of thermal burns suggests that preventive measures will be effective in eliminating them, such as educating the community about fire safety, awareness campaigns targeting high-risk groups, and building a culture predisposed to safety (Stockly, O.R. *et al.*, 2020). The implementation of educational interventions at school and community levels might potentially do quite well in achieving these goals, as they would target children and families who might then be at higher risk for such injuries (Bartley, C.N. *et al.*, 2019).

The facial burn patients' demographics also exhibited a disturbing pattern of differences according to age and sex (Amtmann, D. *et al.*, 2020). One striking element was that a large number of the patients were young and in the lower socioeconomic brackets. This is raising a major question of environmental and social conditions responsible for burns in this population (Hays, R.D. *et al.*, 2018). Further research should focus on the underlying causes for such differences so that they may inform specialized intervention programs. For example, knowing the specific living conditions, household practices, and cultural norms which predispose some of the segments to risks for burns could help develop more targeted and efficient preventive strategies (Huppe, M. *et al.*, 2021).

The evidence also has shown that facial trauma, which may be a strong aggravation factor, significantly affects the recovery process. Patients who had larger facial burns spend longer periods in hospital and need more complicated surgical therapies than patients with smaller injuries (Selim, A.J. *et al.*, 2022). This reinforces the literature findings that facial burns are characterized by specific complications and include postoperative complications and reconstructive surgery glass ceiling. Long hospital stays for rehabilitation burden the hospital and emotionally and psychologically impact the patients and their families (Ding, H. *et al.*, 2020).

These positive dimensions of recovery necessitate that multidisciplinary participation from surgeons, psychologists, and rehabilitation specialists enter at the care level. Psychological support is important in treatment protocols so that emotional care is matched by medical care. Holistic treatment is essential to tackle the long-term repercussions that disfigurement poses and threaten patients' overall well-being.

With respect to surgical outcome evaluation, this study underlines the significance of tailoring a treatment plan to the individual needs of each patient. In selecting surgery, burn depth and area, age of the patient, and comorbidities must inform a particular practitioner's judgment. The variety of surgical methods, including skin grafting and advanced wound care management, indicated that it was important to be flexible in the treatment approach. The data also emphasize the need for monitoring the psychosocial implications of surgical outcomes. Success of surgical interventions and improvement in quality of life reaffirms that good medical treatment is intrinsically tied with psychological recovery. Those patients who tend to see a positive outcome from their treatment are more likely to thus report enhanced well-being.

Life quality outcomes among survivors of facial burn injuries also bear witness to intense emotional suffering, anxiety, and depression, in particular. Many patients expressing the concern that their physical appearance and social interaction were socially unacceptable highlight the need for further support past the discharge from the hospital. Psychological intervention, including counseling and peer support groups, is invaluable in assisting the patient with navigation through the intricacies of recovery. Thus, the healthcare provider must consider the implementation of follow-up programs for patients after discharge, inclusive of mental health evaluations, to be able to actively watch out for these persistent challenges.

CONCLUSION

Given that a number of factors might impact recovery outcomes, the debates around burn trauma in Iraq demonstrate how challenging it is to manage burn injuries. Holistic burn care is better understood in the context of demographic trends, damage mechanisms, surgical procedures, and psychological impacts. Incorporating this combination of psychological and physical problems with an eye toward long-term supportive care, customized therapy, sustainable prevention,

etc., should be the next step in study and practice. Clinicians can significantly improve the treatment provided to burn victims and ultimately improve their chances of recovery in the rapidly expanding healthcare industry by concentrating on these more urgent areas of management. At least in Iraq and elsewhere, they will try to provide prevention measures against burn injuries and enhance the aftermath in terms of favorable patient outcomes now that community settings and clinical practice are merging.

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