Content available at: https://www.ipinnovative.com/open-access-journals

IP Journal of Surgery and Allied Sciences

Journal homepage: https://www.jsas.co.in/

Case Report

Role of belgium outcome of burn injury (BOBI) score in the assessment of mortality in scald burns

Swetha M[1], Ravi Kumar Chittoria[2]*, Rashmi V Kumar[3]

[1]*Dept. of Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India*
[2]*Dept. of Plastic Surgery & Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research, India*
[3]*Dept. of Plastic Surgery, Jawaharlal Institute of Post graduate Medical Education and Research (JIPMER), Pondicherry, India*

ARTICLE INFO

Article history:
Received 05-11-2024
Accepted 07-12-2024
Available online 16-01-2025

Keywords:
Belgium outcome of burn injury (BOBI)
Burn patients
Abbreviated Burn Severity Index (ABSI)

ABSTRACT

Burn injuries are a significant public health concern in developing countries like India, where limited healthcare resources contribute to high mortality rates. Prognostic scoring systems, such as the Belgium Outcome of Burn Injury (BOBI) score, have been developed to predict mortality and guide clinical decision-making. However, their applicability in resource-constrained settings remains underexplored. This study evaluates the effectiveness of the BOBI score in predicting mortality among burn patients in such contexts.To assess the reliability of the BOBI score and other burn prognostic systems in predicting mortality among burn patients in resource-limited settings, focusing on bedside risk assessment, patient counselling, and resource optimization. This case study was conducted in a tertiary care hospital in South India after obtaining ethical committee approval. A 7-year-old male patient with a 7% total body surface area (TBSA) scald burn involving the genitalia, bilateral thighs, and lower abdomen was assessed using the BOBI scoring system. Mortality predictions were based on parameters such as age, TBSA affected, and the presence of inhalation injury.The patient's BOBI score indicated a mortality risk of 0.1%. This low risk was attributed to favorable parameters, including age (<50 years), limited TBSA involvement (<20%), and the absence of inhalation injury. The BOBI score demonstrates potential as a practical tool for predicting mortality in pediatric burn patients and guiding care prioritization in settings with limited resources. However, variability in patient demographics and resource constraints in developing regions necessitate the standardization of scoring systems to enhance their predictive accuracy and applicability. Further studies are recommended to validate BOBI and similar scoring systems for broader use in diverse populations.

1. Introduction

Burn injuries are a significant contributor to mortality in developing countries like India. Accurately predicting mortality among burn patients upon their hospital admission in resource-limited settings aids in assessing patient prognosis and optimizing resource allocation. Prognostic scoring systems for burn victims evaluate the severity of injuries and forecast outcomes, allowing for numerical and scientific risk stratification that can be analyzed statistically. Currently, no scoring system reliably predicts mortality from burns or effectively guides treatment options and the evaluation of new interventions. Existing systems such as the Revised Baux score, Abbreviated Burn Severity Index (ABSI), Ryan et al., Belgium Outcome of Burn Injury (BOBI), Smith et al., and McGwin et al. offer various predictive capabilities.[1–6] Therefore, it is essential to identify the most suitable scoring system for bedside risk

* *Corresponding author.*
E-mail address: drchittoria@yahoo.com (R. K. Chittoria).

https://doi.org/10.18231/j.jsas.2024.031

assessment and patient counselling, necessitating thorough testing of all available systems to determine the best predictor of outcomes.

2. Case Report

The study was carried out in a tertiary care hospital in South India after receiving approval from a departmental ethical committee. The subject was a 7-year-old male child with a history of scald burn involving genitalia, bilateral thigh and lower abdomen with partial thickness superficial burns of TBSA ~7%.

3. Result

The overall mortality of the above patient using Belgium outcome of burn injury (STSG) is as follows:

Age < 50 years - 0

Total body surface area <20 % - 0

Inhalational injury - 0

Total score - 0

Total mortality -0.1%

Belgium outcome of burn injury (BOBI) score:
Total mortality percentage:

Table 1: Parameters in BOBI score

Age	Score
<50 years	0
50-64 years	1
65 - 79 years	2
>80 years	3
Total body surface area (TBSA)	Score
<20%	0
20-39%	1
40-59%	2
60-79%	3
80-100%	4
Inhalational injury	Score
Yes	3
No	0

Table 2: Total mortality percentagebased on BOBI score

Total score	Mortality percentage
0	0.1%
1	1.5%
2	5%
3	10%
4	20%
5	30%
6	50%
7	75%
8	85%
9	95%
10	99%

4. Discussion

The World Health Organization (WHO) estimates that burn injuries result in approximately 180,000 deaths annually, predominantly in low- and middle-income countries where resources are limited. Despite advancements in the management of burn injuries that have led to reduced mortality rates, high burn mortality persists in developing nations due to constrained resources.[7] In India alone, around 1 million individuals suffer from moderate to severe burns each year.[8]

In these countries, burn intensive care unit beds are scarce, largely due to a shortage of trained healthcare professionals and the high costs associated with maintaining such facilities.[9,10] Given the current limitations in bed availability, the implementation of burn scoring systems and prognostic scores is essential for triaging patients based on the severity of their injuries, guiding treatment, managing resources, and providing support to families.[11]

While numerous predictors of mortality and various scoring systems exist, none can accurately predict outcomes in every scenario. Many of these mortality prediction models have been developed in high-income countries and may not translate effectively to populations in developing regions due to differences in patient demographics, standards of care, and available resources.

Historically, the first significant prognostic factors identified for predicting burn mortality were total body surface area (TBSA) and age, initially proposed by Weidenfeld in 1902.[12] These parameters were later validated by Bull and Squire in 1949, and subsequently by Baux in 1963 with the introduction of the Baux score.[13] Other scoring systems, such as the Abbreviated Burn Scoring Index (ABSI), Ryan et al., Belgium Outcome of Burn Injury (BOBI), Smith et al., and McGwin et al., have also been developed to assess mortality risk in burn patients.[14]

Score can be applied on all patients.

5. Conclusion

BOBI can serve as a predictor of mortality in burn patients and assist in prioritizing patient care for optimal resource allocation in developing nations such as India. However, it's important to note that the BOBI score alone cannot accurately determine patient outcomes. Standardization of the scoring system is needed to account for variations in population and resources.

6. Source of Funding

None.

7. Conflicts of Interest

None.

References

1. Osler T, Glance LG, Hosmer DW. Simplified estimates of the probability of death after burn injuries: extending and updating the Baux score. *J Trauma*. 2010;68(3):690–7.
2. Tobiasen J, Hiebert JH, Edlich RF. Prediction of burn mortality. *Surg Gynecol Obstet*. 1982;154(5):711–4.
3. Ryan CM, Schoenfeld DA, Thorpe WP, Sheridan RL, Cassem EH, Tompkins RG, et al. Objective estimates of the probability of death from burn injuries. *N Engl J Med*. 1998;338(6):362–6.
4. in Burn Injury Study Group BO. Development and validation of a model for prediction of mortality in patients with acute burn injury. *Br J Surg*. 2009;96(1):111–7.
5. Smith DL, Cairns BA, Ramadan F, Dalston JS, Fakhry SM, Rutledge R. Effect of inhalation injury, burn size, and age on mortality: a study of 1447 consecutive burn patients. *J Trauma*. 1994;37(4):655–9.
6. Mcgwin G, George RL, Cross JM, Rue LW. Improving the ability to predict mortality among burn patients. *Burns*. 2008;34(3):320–7.
7. Noor DM, Wicaksana A, Fauzi AR. Comparison between revised Baux score and abbreviated burn severity index as a predictor of mortality in burn patients at a tertiary care center in Yogyakarta, Indonesia. *Eur J Plast Surg*. 2020;43(1):53–8.
8. Geneva: World Health Organization; 2018. Available from: https://www.who.int/news-room/fact-sheets/detail/burns.
9. Bucher F, Dastagir K, Obed D, Dieck T, Vogt PM. Sustained high demand for intensive care unit resources for the treatment of burn patients during the COVID-19 pandemic in Northern Germany: A single-centre cross-sectional study. *JPRAS Open*. 2022;34:82–90.
10. Marwa NP, Tarimo EAM. Provision of care to hospitalized pediatric burn patients: a qualitative study among nurses at Muhimbili National Hospital. *BMC Nurs*. 2019;18:8.
11. Wardhana A, Wibowo J. Predicting Mortality in Burn Patients: Literature Review of Risk Factors for Burn Mortality and Application in Scoring Systems. *Ann Burns Fire Dis*. 2023;36(1):3–10.
12. Baker CC, Miller CL, Trunkey DD. Causes of mortality and morbidity in patients with thermal injuries. *Am J Surg*. 1979;138(6):771–7.
13. Bull JP, Squire JR. A study of mortality in a burns unit: standards for the evaluation of alternative methods of treatment. *Ann Surg*. 1949;130(2):160–73.
14. Chittoria RK, Nair AG, Kerakada N, Kumar DP, Yadav A. Utility of Belgium Outcome of Burn Injury Score (BOBI score) in predicting mortality in burn patients: a case report. *Madridge J Dermatol Res*. 2021;5(1):110–2.

Author's biography

Swetha M, Junior Resident

Ravi Kumar Chittoria, Professor & Registrar (Academic) Head of IT Wing and Telemedicine

Rashmi V Kumar, Senior Resident

Cite this article: Swetha M, Chittoria RK, Kumar RV. Role of belgium outcome of burn injury (BOBI) score in the assessment of mortality in scald burns. *IP J Surg Allied Sci* 2024;6(4):135-137.