Mortality from Burns Sustained On Home Oxygen Exceeds Predicted Mortality

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Introduction

Almost one million Americans are receiving home oxygen therapy (HOT) due to severe lung disease. In spite of the risks, many patients continue to smoke, placing them at risk of burn injury. There are currently no validated prognostication models in this population.

Hypothesis

ABSI and Boston Criteria mortality prediction models underestimate yearlong mortality in patients on HOT

Boston Criteria Risk Factors

Age >60

TBSA > 40%

+ Inhalation Injury

Risk Factors	Mortality Risk
0	0.3%
1	3%
2	33%
3	87%

Abbreviated Burn Severity Index

Variable	Patient characteristic	Score
Sex	Female	1
	Male	0
Age in years	0–20	1
	21–40	2
	41–60	3
	61–80	4
	81–100	5
Inhalation injury		1
Full thickness burn		1
Total body surface area burned (%)	1–10	1
	11–20	2
	21–30	3
	31–40	4
	41–50	5
	51–60	6
	61–70	7
	71–80	8
	81–90	9
	91–100	10

Total burn score	Threat to life	Probability of survival (%)
2–3	Very low	≥99
4–5	Moderate	98
6–7	Moderately severe	80–90
8–9	Serious	50–70
10–11	Severe	20–40
12–13	Maximum	≤10

Figure 1: Burn mortality prediction models used for comparison: Boston criteria (left) and ABSI (right)

Methods

- Retrospective chart review of patients from 2013-2017 who sustained a burn injury due to combustible tobacco while on home oxygen therapy.
- Primary outcome: all-cause mortality at 1 year compared to Boston Criteria and ABSI
- Secondary Outcomes included procedures required during hospitalization and disposition.

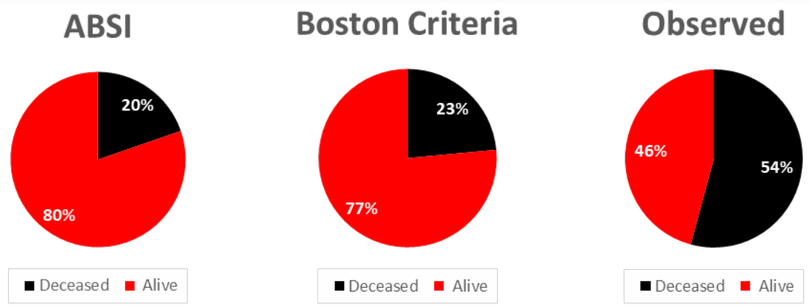

Figure 2: Comparison of observed mortality at one year and ABSI and Boston Criteria models. P-value <0.05 denoted by *.

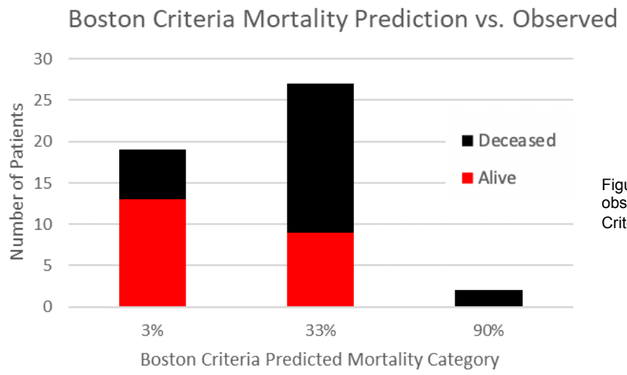

Figure 3: Patients' predicted versus observed mortality by Boston Criteria at one year post-injury

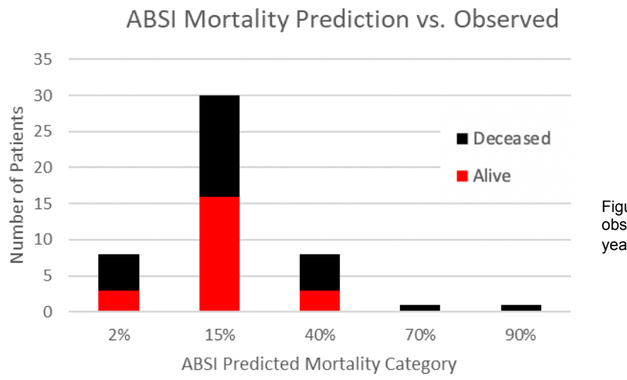

Figure 4: Patients' predicted versus observed mortality by ABSI at one year post-injury

Results

- 48 patients that met our inclusion criteria
- 26 patients (54%) died within 1 year of injury.
  - Mortality Boston criteria: 23.5% (p=0.03)
  - Mortality by ABSI: 19.7% (p=0.59)

Demographics and clinical outcomes:

- Associated with a higher risk of death
  - Advanced age (p = 0.01)
  - History of MI, CHF, or stroke (p = 0.04)
  - Requiring alternative disposition (p = 0.04)
- **Amount of O_2** was not significant (p = 0.80)
- **Goals of Care** were only discussed in three patients (6%)

Conclusion

Current burn prognostication models underestimate mortality of patients who sustain a burn injury while on HOT.

- Patients are likely in a more fragile state of health pre-injury
- Our results can help guide patient and family discussions
- Palliative care and goals of care discussions should be considered early

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References can be found using the following QR code: