Acute Burn Treatment and Mechanical Ventilation

Eliana F R Duraes, MD, PhD; Eliza Slama, MD, MPH; Ashley Modica, MD; Mohammed Asif, MD ; Julie Caffrey, DO; Charles S Hultman, MD

[1] Plastic Surgery Burn Center, Johns Hopkins University School of Medicine, Baltimore, MD, USA;

Introduction

Mechanical ventilation (MV) is a "necessary evil" during the acute treatment of patients with extensive burns and/or inhalation injury. Once MV is initiated, minimizing its length is a priority.

Objectives

Our aim was to explore mechanical ventilation during the acute burn treatment and factors associated with a successful extubation.

Materials and Methods

- A retrospective review was performed on all burn patients that required MV in a reference burn center from December 2015 to April 2018.
- Exclusion: Patients intubated after coding on the field and confirmed dead on 1st 24h
- First analysis:
  - Group 1 - Patients successfully extubated or on trach collar
  - Group 2) - Patients that required re-intubation or died on MV
- Second analysis based on duration of MV, after excluding the patients that died under MV:
  - Group A, 3 or less days;
  - Group B, 4 or more days.
- A $p \leq 0.05$ was considered significant.

Conclusion

Lower expected mortality and age, and smaller %TBSA burned are associated with a successful extubation. Previous psychiatric illness may be associated with the need for re-intubation.

The authors have no disclosures

Results

Table 1: First analysis	Group 1: Successfully extubated (n=68)	Group 2: Re-intubated or dead (n=29)	P value
Female	24 (35.3%)	9 (31%)	0.685
Drug use	26 (38%)	8 (27.6%)	0.314
MME/day	66.09±120.8	113.76±354.68	0.111
Age	48.42±18.66	59.15±21.38	**0.032**
LOS	40±64.3	38.62±77.34	0.416
Expected mortality	10% ±16.11%	48.54±39.33	**<0.001**
Days on Mechanical Ventilation	12.93±20.94	13.72±16.57	**0.048**
Tracheostomy	13 (19.1%)	7 (24.1%)	0.576
%TBSA	18.4±19.72	34.39±25.86	0.002
Carboxyhemoglobin	5.35±8.4	8.38±13.33	**0.767**
Inhalation confirmed	25 (36.8%)	16 (55.2%)	**0.093**
Smoking status			0.277
No History of respiratory disease	50 (73.5%)	25 (86.2%)	0.371
Surgeries on the first admission	3.3±5.4	3.66±9.36	0.946
Hour Albumin was started	7.23±4.24	6.69±3.83	0.801
Albumin vol 1st 24h	329.84±619.86	899.45±1199.65	**0.016**
Urine	1543±1216.56	1004.86±680.1	**0.010**
Crystalloids vol 1st 24h	5383.87±7651	10345.72±10053.28	**0.006**

After exclusion of the 19 (19.5%) patients that died on MV, a sub-analysis of the group that required re-intubation (n=10) and the successfully extubated showed an increased rate of psychiatric illness among the group requiring re-intubation: 18 (26.5%) vs 7 (70%), p<0.001.

Table 2: Second Analysis	Three or less days on MV (n=40) Group A	Four or more days on MV (n=38) Group B	P value
Female	15 (37.5%)	12 (31.6%)	0.583
Drug use	15 (37.5%)	15 (39.5%)	0.858
Alcohol Intoxication when burned	5 (12.5%)	9 (23.7%)	0.198
Psychiatric History	11 (27.5%)	14 (36.8%)	0.377
MME/day	71.87±151.11	109.68±300.96	0.155
Age	53.23±18.21	43.9±17.54	**0.029**
LOS	10.6±15.88	73.89±75.03	**<0.001**
Expected mortality	10.39% ±16.26%	10.13±15.25	0.682
Tracheostomy	1 (2.5%)	16 (42.1%)	**<0.001**
%TBSA	7.68±8.37	30.55±22.15	**<0.001**
Carboxyhemoglobin	5.36±9.35	5.96±8.10	0.314
Inhalation confirmed	14 (35%)	17 (44.7%)	0.380
Smoking status			0.777
No History of respiratory disease	27 (67.5%)	31 (81.6%)	0.607
Surgeries on the first admission	0.67±2.03	5.97±6.23	**<0.001**
Albumin volume on the 1st 24h	69±311.33	635.37±759.26	**<0.001**
Crystalloids volume on the 1st 24h	2521.13±3923.18	8943.5±9543.39	**<0.001**