

Assessing Head-Lift time as a prediction model for extubation in the ICU: A Prospective observational study

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BACKGROUND

Successful extubation is a critical step and alters patient outcomes in the Intensive Care Unit. However, the decision remains subjective with several objective clinical prediction models to help clinicians.

METHODS

Prospective observational study where we introduced measurement of Head-lift time (HLT) as a neurocognitive assessment model in ventilated patients who successfully underwent spontaneous breathing trial prior to extubation. We collected demographic and clinical information, HLT and Rapid-Shallow Breathing index (RSBI) scores for 6-month period; our primary endpoint was extubation failure. Data analyzed using Pearson Chi-square test and multinomial regression analysis.

Figure 1. Bar Chart indicating on the x-axis the two variables of HLT greater than 3 and less than/equal to 3 seconds with y-axis representing the count of patients with extubation failure and success

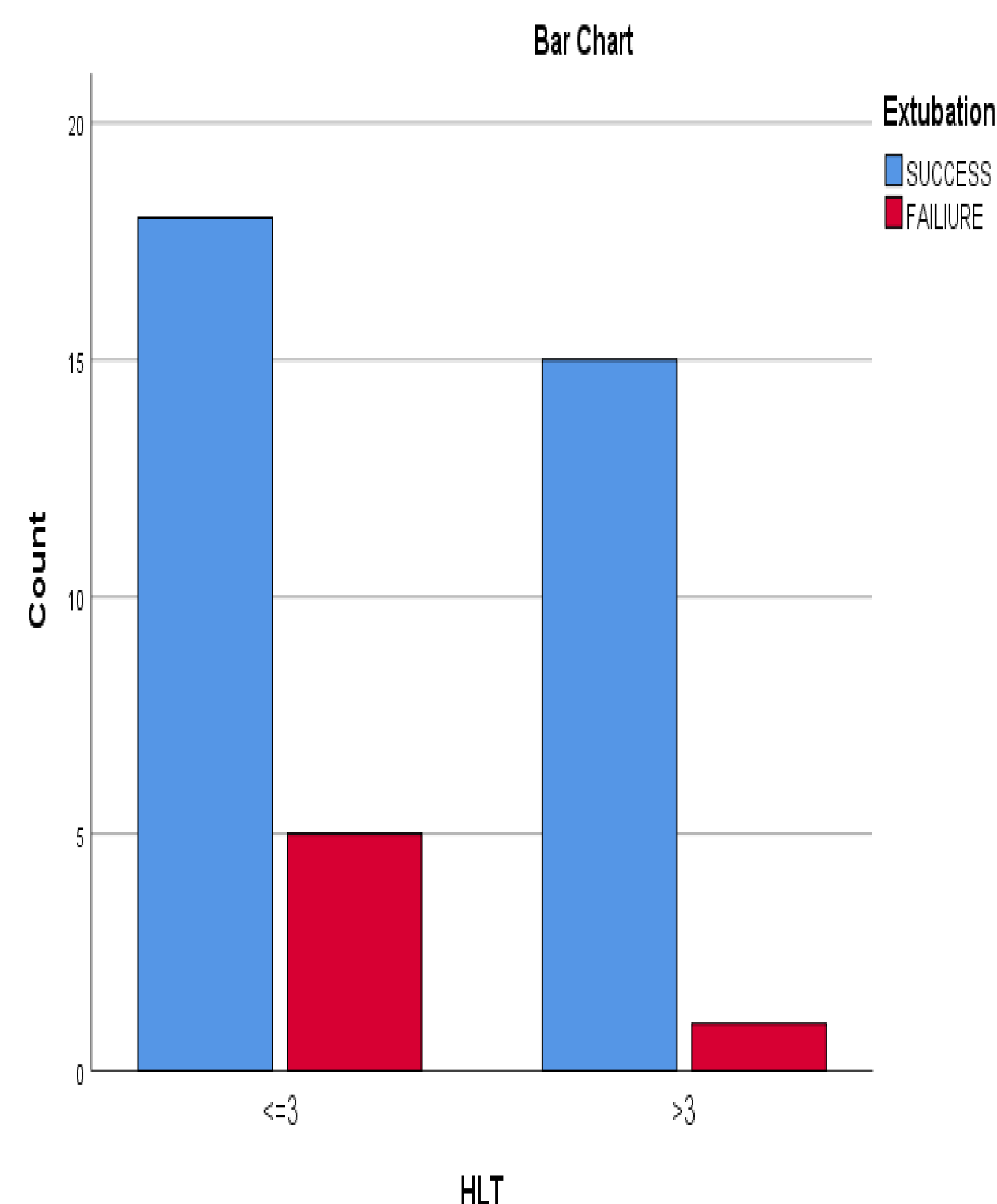


Figure 2. Demographics, cause of extubation failure with baseline clinical features and HLT in subjects who failed extubation.

Age/S ex	High-risk comorbidities	Reason for Intubation	Post-extubation Care	HLT (s)	RS BI
69/M ^a	None	AE ^c	VM ^f	0	42
53/M	None	AE	VM	0	40
83/F ^b	None	T1RF ^d	VM	0	40
64/M	None	AE	VM	0	54
78/M	None	CA ^e	VM	2	58
64/M	None	T1RF	VM	5	90

^aMale ^bFemale ^cAcute Encephalopathy ^dType 1 Respiratory Failure ^eCardiac Arrest ^fVentimask
*High-risk comorbidities defined as acute coronary syndrome, Heart failure with reduced or preserved Ejection Fraction, COPD or Interstitial Lung disease.

RESULTS

Total of 39 patients were included; 22 were males and 17 females. 6 patients failed extubation (Figure 2) with mean HLT of 1.16 seconds (s) compared to 3.21 s for patients successfully extubated (Table 1). 5 out the 6 patients that failed extubation had a HLT of ≤ 3 s, with a likelihood ratio of 1.921 with 95% CI p-value of 0.37 and odds ratio of 0.24 (95% CI 0.025 – 2.286: p-value = 0.215) (Figure 1). Mean ventilator support duration was 6.33 days for patients who failed extubation compared to 4.92 days for successfully extubated.

CONCLUSIONS

Conclusion: Patients with HLT ≤ 3 s had lower odds of successful extubation, and those who failed extubation had a lower mean HLT and increased time on ventilator compared to their counterparts who succeeded. Results illustrates the importance of using multiple assessment measures including neurocognitive assessment along with hemodynamic and respiratory parameters to guide the physician's decision to extubate rather than use them in isolation or purely based on a subjective assessment of the patient.