Can Pre-Hospital Medical Management Predict In-Hospital Mortality in Trauma

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Background

- In the United States nearly 150,000 patients die each year from traumatic injury and for individuals under the age of 45
- Trauma patients who are diagnosed with pre-existing medical conditions may need prioritized critical care management due to reductions in physiologic reserves.
- Regardless of injury severity, previous research has identified that pre-existing comorbidity, using the combined comorbidity index of Charlson and Elixhauser is a critical factor in influencing in-hospital mortality rates.
- Knowledge of the relevant identified risk profile in mortality could aid the trauma team in improved outreach and education in preventing and managing in-hospital mortality.

Objective

Determine if the comorbidities that may contribute to an in-hospital mortality in this unique trauma system

Methods

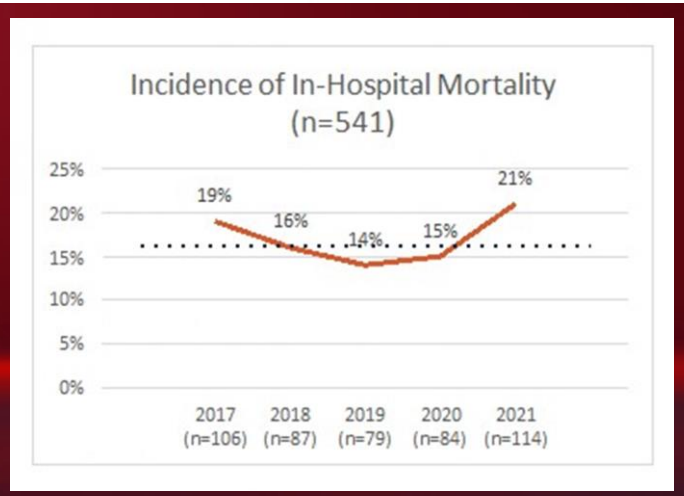
- A single-center study of trauma registry data from July 1, 2016, to February 28, 2022 was performed.
- Trauma registry data were retrospectively reviewed to collect patient demographics, injury details, complications, comorbidity, and patient outcomes.
- A total of 19321 patients were included.
- The data was summarized and analyzed using a multivariate logistic regression in SPSS-28 to ascertain the effects of predictor variables (Comorbidities) on the likelihood that an adult trauma patient will experience in-hospital mortality

Results

Table 1. Logistic Regression Analysis of All Adult (≥ 18 years) Trauma Patients, Inclusive Years July 1, 2016 to February 28, 2022 (N=19321)

Outcome/Dependent Variable: Expired (In-House Mortality)

	B	S.E	Wald	df	Sig.	Exp(B)
Pre-Hospital Cardiac Arrest	3.08	.89	11.86	1	<.01	21.85
Trauma Activation						
Partial	-1.87	.54	11.69	1	<.01	.15
Consult	-1.26	.81	2.41	1	.12	.28
ISS	.13	.01	49.85	1	<.01	1.14
GCS	-.28	.04	40.22	1	<.01	.75
ICU Length of Stay in Days	1.19	.36	10.82	1	<.01	3.31
Hospital Length of Stay	-1.82	1.00	3.30	1	.06	.16
Pre-existing Comorbidity						
Advanced Directive Limiting Care	.31	.67	.21	1	.64	1.36
Alcohol Use Disorder	-3.07	3.17	.93	1	.33	.04
Anticoagulation Therapy	1.75	.52	11.27	1	<.01	5.81
Congestive Heart Failure	.92	.70	1.68	1	.19	2.51
COPD	1.22	.64	3.61	1	.05	3.41
Dementia	-.21	.86	.05	1	.81	.81
Functionally Dependent Health Status	-.66	1.09	.36	1	.54	.51
Hypertension	.51	.48	1.11	1	.29	1.66
Personality Disorders	.34	.78	.19	1	.66	1.41
Myocardial Infarction	1.37	.97	1.99	1	.15	3.96
Substance Use Disorder	-.53	1.28	.17	1	.67	.58
Constant	-1.78	.79	5.00	1	.02	.16



Discussion

- Adult trauma patients with pre-hospital anticoagulation therapy where 5.81 times more likely to experience an in-hospital mortality.
- Antiplatelet and anticoagulation therapies have shown to increase mortality among traumatic brain injury (TBI) patients; however, are not correlative in the absence of TBI.4
- The GCS score is often utilized to categorize severity of TBI.
- GCS score at admission was also identified as an independent risk factor for in hospital mortality in this group.
- As GCS increased by one unit, there was a 25% reduction in odds that a trauma patient would experience an in-hospital mortality.
- This is in concordance with the previously reported correlation between mortality and anticoagulant use amongst trauma patients with TBIs.

Conclusion

- Specific preexisting medical conditions were associated with increased mortality after trauma, regardless of increasing age.
- This research highlights the need to prioritize enhanced critical care management of trauma patients with comorbidities, in particular COPD and anticoagulant therapy in TBI patients.

References

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