

Analysis of Fibrinolytic Shutdown in Trauma Patients with Traumatic Brain Injury

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Objectives

- Coagulopathy including fibrinolysis following major trauma is common, although this mechanism remains poorly understood.
- Fibrinolytic shutdown is demonstrated in up to 25% of traumatic brain injury (TBI) patients.
- The objective of this study was to evaluate the fibrinolytic profile of patients with TBI using thromboelastography (TEG).
- We hypothesized that patients with TBI would demonstrate low fibrinolytic activity.

Methods

- All trauma activations at an ACS-verified level 1 trauma center received a TEG from December 2019 to June 2021.
- TBI patients were compared to patients without TBI.
- Hyperfibrinolysis was defined as LY30 > 7.7%, physiologic fibrinolysis as LY30 0.6%-7.7%, and fibrinolytic shutdown as LY30 < 0.6%.

Results

- 1369 patients received an admission TEG analysis.
- Patients with TBI had:
 - Higher ISS
 - Lower admission Glasgow Coma Scale
 - Longer ICU length of stay
 - Increased ventilator days
 - Higher mortality
- ISS, sex, and shock index were found to be predictive of LY30 on linear regression, but TBI was not.
- The rate of DVT/PE was not increased in TBI patients (0.8%) and without TBI (1.2%).

Conclusion

- Trauma patients with and without TBI exhibit high rates of fibrinolytic shutdown.
- Shutdown did not appear to impact thrombotic complications.
- The clinical significance of these results is unclear and differs from recent reports showing a 25% rate of fibrinolytic shutdown in TBI patients.
- Further investigation is needed in order to develop optimal treatment algorithms.



Variable	All Patients (n=1369)	No TBI (n=768)	TBI (n=601)	P-value
LY 30	0.200 (0.00-0.98)	0.2 (0-1.1)	0.1 (0-0.85)	0.006
Lysis: Low	901 (65.8%)	488 (63.5%)	413 (68.7%)	0.054
Physio	445 (32.5%)	269 (35.0%)	176 (29.3%)	
High	22 (1.6%)	10 (1.3%)	12 (2.0%)	