A Troubled Mind: Description of In-Hospital Cerbrovascular Events and Delayed Cerebrovascular Ischemia Among Adult Trauma Patients with Intracerebral Hemorrhage

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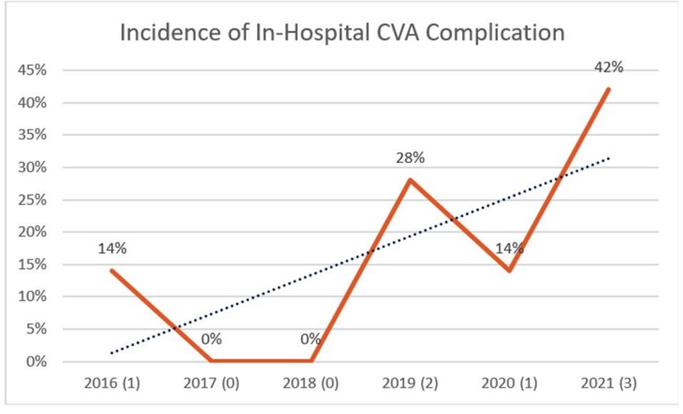
Background

- Neurotrauma, by definition, is an insult to the brain parenchyma causing varying levels of deficit, dysfunction, and disease that have long-lasting effects on the patient both from a cognitive standpoint and functional standpoint.
- Descriptive statistics were analyzed to elucidate patterns of injury and demographics that may be further extrapolated to increase clinical suspicion in future patients with similar injury patterns.

Methods

- This is a single-center study of Trauma Registry data, from July 1, 2016, to October 31, 2021.
- The inclusion criteria were based upon age (≥40 years) and ICD10 diagnosis of an ICH with an in-hospital CVA complication.
- An operational performance improvement investigation verified the confirmation of a CVA. Descriptive statistics were used to summarize the characteristics of the study population.



This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

Results

Table 1. Descriptive Statistics of Adult (>40 years) Trauma Patients Diagnosed with an ICH, Inclusive Years July 1, 2016 to October 31, 2021 Who Experienced an In-Hospital CVA Complication (N=7)

	N	%	Mean
40-49 year olds	1	14%	
50-64 year olds	1	14%	
65-74 year olds	3	42%	
75-84 year olds	2	28%	
Age	7		67
Gender			
Male	6	85%	
Female	1	14%	
Race			
African American	1	14%	
Caucasian	6	85%	
Transferred In	2	28%	
Types of ICH			
Subdural Hemorrhage	6	85%	
Subarachnoid Hemorrhage	1	14%	
Mode of Arrival			
Ground	5	71%	
HEMS	2	28%	
Trauma Activation			
Full	6	85%	
Consult	1	14%	
ISS	7		19.85
Mode of Injury			
Fall	3	42%	
MCC	1	14%	
MVC	3	42%	
Mechanism of Injury			
Blunt	7	100%	
AIS Body Region			
Head	7		3.71
Face	3		1.33
GCS	7		10.85
Shock Index Ratio	7		0.61
ICU Length of Stay in Days	7		23.85
Vent Days	4		12
Hospital Length of Stay in Hours	4		317.32
Over 1000 hours	3		
Discharge Disposition			
Expired	1	14%	
Home without Care	1	14%	
Home with Care/LTACH/STIC	1	14%	
Hospice	1	14%	
Rehab	3	42%	
Pre-existing Comorbidity			
Alcohol Use Disorder	1	14%	
Anticoagulation Therapy/Bleeding Disorder	1	14%	
Cerebral Vascular Accident	1	14%	
Chronic Renal Failure	1	14%	
Functionally Dependent Health Status	1	14%	
Hypertension	3	42%	
Complications			
DVT/PE	1	14%	
Unplanned Intubation	1	14%	
Unplanned Admission to ICU	3	42%	
VTE Administration			
Unfractionated Heparin	1	14%	
LMWH	4	57%	

Table 1: Descriptive of all trauma patients requiring an emergent laparotomy who then had a post-op CT, inclusive years January 9, 2016 to June 2, 2020. (N=17)

	N	%	Mean(SD)Min-Max
Primary Injury Location			
Thoracic	2	11%	
Abdominal	4	23%	
Pelvic	3	17%	
Thoracic Abdominal	6	35%	
Thoracic Pelvic	1	5%	
Thoracic Abd Pelvic	1	5%	
Elapsed Time [h]:mm			
Trauma Bay to Incision	17		0:45(0:27) 0:13-2:16
Operating Room Time	17		1:09(0:42) 0:13-3:31
Trauma Bay to CT	17		6:17(9:05) 1:01-36:04
Trauma Bay Interventions			
MTP			
Plasma	10	58%	
Platelets	10	58%	
Packed Red Blood Cells	15	88%	
FAST			
Positive	11	64%	
Negative	5	29%	
Discharge Disposition			
Expired	4	23%	
Extended Care Facility	2	11%	
Home without Services	9	52%	
Transfer	1	5%	
Post-Operative CT identified Occult Injuries			
Hollow Organ	2	11%	
Neuro	4	23%	
Orthopedic	6	35%	
Solid Organ	4	23%	

Discussion

- Seven patients (mean age=67) were included in the analysis based on the requirements specified in the methods section.
- A positive trend in the occurrence of in-hospital CVA complications was seen during the study timeframe.
- The majority of the ICH CVA patients were Caucasian (n=6, 85%), males (n=6, 85%) who were diagnosed with a subdural hemorrhage (n=6, 85%).
- The mean injury severity score was 19.85, with a mean GCS of 10.85 and a mean shock index of 0.61.
- VTE prophylaxis was administered to 5 (71%) with a mean elapsed time from trauma bay to administration of 7 hours and 13 minutes.
- Only one patient experienced in-hospital mortality (14%), and one was discharged to hospice (14%).

Conclusion

- This research highlighted an upward trend in older adult CVA complications in the ICH trauma population, particularly during 2021.
- Further research in potential VTE prophylaxis reversal with timings could be beneficial in the potential explanation of the upward trend.

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