



Validation of Brain Injury Guidelines in the Elderly Trauma Patient Presenting at A Level II Trauma Center

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BACKGROUND

Head injury remains one of the most common injuries sustained by elderly patients and the cost of management of those patients increases proportionally. Attempts to refine the management and reduce unnecessary rests and costs continue, and in 2013 brain injury guidelines (BIG) were published to simplify the management of those patients. We started implementing those guidelines mid-2019. We collected our data to evaluate the validity of the guidelines by comparing the outcome to pre-2019 patients. The end point was readmission within 1 month, mortality, surgical intervention, decline in neurologic status, and progression in the head computerized tomography (CT). We elected to evaluate these guidelines in our elderly trauma patients after implementing the protocol.

OBJECTIVE

To validate the brain injury guideline (BIG) in the management of traumatic head injury in our level II trauma center after implementation of the protocol

METHODS

- Retrospective analysis of 542 patients seen in the ED with head injuries between 2017-2021
- Divided into 2 groups:
- Group 1 (pre-BIG I protocol implementation) seen between January 2017 – June 2019
- Group 2 (post-BIG I protocol implementation) seen between July 2019 – December 2021
- BIG I criteria included:
- With or without a loss of consciousness
- Without intoxication
- Without anticoagulant therapy
- CT findings: no skull fracture, ≤4mm of subdural, epidural, intraparenchymal bleeding bit no intraventricular hemorrhage
- Patients kept for 6 hours without neurosurgical consultation or repeat head CT

RESULTS

	Pre-Group n = 98	Post-Group n = 24	P value
Age (n ± SD)	44 = 23.58	70 = 14.26	0.0001
Sex (% male %female)	55% 45%	33% 67%	0.05
Comorbid Conditions ≤4	8%	29%	0.004
Loss of consciousness	39%	42%	0.79
GCS (mild=14-15)	95%	98%	0.6
Intoxication	0	0	-
Anticoagulant Therapy	0	0	-
Skull fracture	0	0	-
Subdural hematoma (n%) ≤4mm	8 (8%)	11 (46%)	0.0001
Subarachnoid hematoma (n%) trace	6 (6%)	12 (50%)	0.0001
Intraparenchymal hematoma (n%) localized	1 (1%)	4 (17%)	0.0001
Observation 6 hours (%)	46%	80%	0.01
Mortality (n,%)	4 (4%)	1 (4%)	-
Discharge location (%)			0.003
Home	70%	42%	
Extended Care	8%	4%	
Rehabilitation	1%	13%	
Other	21%	43%	

Table 1. Analysis of 122 Patients with BIG I Criteria in Pre- and Post-Implementation of the Guidelines

DISCUSSION

Traumatic brain injury (TBI) remains a leading cause of death and morbidity, and encompasses a wide range of the clinical spectrum. Furthermore, strategies and guidelines for the management of patients with TBI are numerous and flourishing. In our institute (level II trauma center) with 400 hospital beds, serving a community with a large population of elderly patients (with a mean age for hospital admissions of 64 years). While our study indicated that applying the BIG criteria, specifically BIG I, is feasible and safe, we found the timing of observation needs to be within 23 hour observation.

CONCLUSION

Elderly trauma patients may benefit from implementation of the BIG criteria protocol, and thus reducing cost of patient care, however a larger sample size is needed for generalizability.

REFERENCES

1. Joseph B, Friese RS, Sadoun M, et al. The BIG (brain injury guidelines) project: Defining the management of traumatic brain injury by acute care surgeons. J Trauma Acute Care Surg. 2014; 76(4):965-969. doi:10.1097/TA.000000000000161
2. Lumba-Brown A, Prager EM, Harmon N, et al. A review of implementation concepts and strategies surrounding traumatic brain injury clinical care guidelines. J Neurotrauma. 2021;38(23):3195-3203. doi:10.1089/neu.2021.0067
3. Di BS, Wei M, Ma WJ, et al. A critical review to traumatic brain injury clinical practice guidelines. Medicine (Baltim). 2019;98(9):e14592. doi:10.1097/MD.00000000000014592
4. Manquen J, Combs T, Mazur-Mosiewicz A, et al. A review of research efforts to address the 2008 ACEP guideline for mild traumatic brain injury. Am J Emerg Med. 2019;37(1):73-79. doi:10.1016/j.ajem.2018.04.061