

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

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**Background:**

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

**Method:**

A retrospective analysis of 542 patients seen in the Emergency Department (ED), with head injury between 2017-2021 was completed. Those patients were divided into two groups: Group 1 (pre BIG protocol implementation ) seen between January 2017- June 2019, and Group 2 (post BIG protocol implementation) July 2019- December 2021. The patients who fell into BIG 1 criteria included those patients with or without loss of consciousness and no intoxication and no anticoagulant therapy, CT findings of no skull fracture and presence of less or equal to 4mm of subdural, epidural, or intraparenchymal bleeding but no intraventricular hemorrhage. Patients will be kept for 6 hours without neurosurgical consultation or repeat head CT.

**Results:**

There were a total of 542 consecutive patients with traumatic brain injury, 314 patients in group 1 and 228 patients in group 2. The mean age of group 2 was significantly higher than group 1 (67 vs 59 years, p=0.0001), however their gender was similar. Data available on 526 patients were classified as BIG 1=122, BIG 2=73, BIG 3=331 patients. Data on BIG 1 were analyzed and divided into two groups (before and after implementing BIG guidelines). Post-implementation group were older (70 vs 44 years, p=0.0001) with more females (67% vs 45%, p=0.05) and had significantly more than 4 comorbid conditions (29% vs 8%, p=0.004), with the majority presented with a size of 4 mm or less of acute subdural or subarachnoid hematoma. No patient in either group had progression of their neurological examination, neurosurgical intervention, or readmission.

	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 or more	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 Hemorrhage (n, %) trace	6 (6%)	12 (50%)	0.0001
Intraparenchymal Hemorrhage ≤ 4mm, localized	1 (1%)	4 (17%)	0.0001
Observation 6 hours (%)	46%	80%	0.01
Mortality (n, %)	4 (4%)	1 (4%)	-
Discharge location (%)			
Home			
Extended Care Facility	70%	42%	
Rehabilitation	8%	4%	0.003
Other	1%	13%	
	21%	43%	

**Table 1**

Analysis of 122 patients with BIG 1 criteria in pre- and post- implementation if 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 1, 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:**

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