Routine Repeat Imaging Is Unnecessary for Coagulopathic Patients Sustaining Head Trauma

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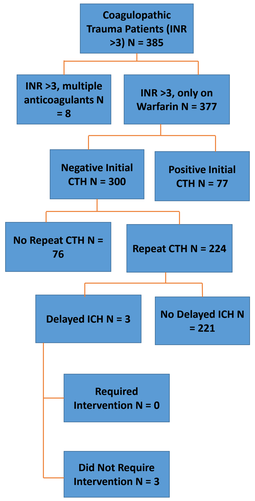
Introduction

In trauma patients using warfarin, current guidelines recommend computed tomography of the brain (CTH), of delayed ICH (DICH) in trauma patients on supra-therapeutic warfarin without initial ICH24-hour observation and repeat CTH to monitor for stability. Despite growing evidence of uncommon delayed hemorrhage, this remains standard practice even in mild TBI without intracranial hemorrhage (ICH). Our study sought to determine the incidence and outcomes

Methods

- **A retrospective, single institutional study**
- **Adult trauma patients (>18 years old) on prehospital warfarin with an international normalized ratio (INR) >3 and initial CTH that did not demonstrate ICH.**
- **All patients underwent subsequent CTH within 24 hours and any DICH was identified.**
- **Those who demonstrated DICH were further examined to identify potential risk factors and outcomes such as need for further imaging or surgical intervention.**
- **Analyses were performed using Fisher's exact tests and Student's t-tests**



Results

Variable	Conversions (3) n (%)	No Conversions (222) n (%)	p
Demographic			
Sex			0.247
Male	3(100)	111 (50)	
Female	0 (0)	111 (50)	
Mechanism of Injury			
MOI			0.233
Fall	2 (66.7)	204 (91.9)	
MVC	1 (33.3)	11 (5.0)	
Other	0 (0)	7 (3.2)	
Glasgow Coma Scale			
GCS			0.418
7-13	0 (0)	6 (2.7)	
14	1 (33.3)	29 (13.1)	
15	2 (66.7)	181 (81.5)	
Invasive Intervention			
Intervention			----
yes	0 (0)	----	
No	3 (100)	----	
AIS Head			
AIS Head			0.002 *
<3	1 (33.3)	217 (97.7)	
≥3	2 (66.7)	5 (2.3)	
Reversal			
Reversed			0.264
Yes	2 (66.7)	74 (33.3)	
No	1 (33.3)	148 (66.6)	
Other			
Platelets, mean (±SD)	**158 (144-173)**	**218 (213-224)**	**0.1733**
SBP (mmHg), mean (±SD)	123 (114-131)	148 (146-150)	0.1299
Age, mean (±SD)	63 (50-75)	80 (79-81)	0.0075*

Discussion

- Patients with traumatic injury on supra-therapeutic warfarin (INR > 3), an initial CT brain without identified intracranial hemorrhage alone is an adequate survey for hemorrhage. Without an identified ICH on initial imaging, 98.67% of our patients went on to have no ICH on repeat CTH.
- Those who developed DICH on subsequent CTH, none developed an ICH of enough clinical size to require reversal of their warfarin or any intervention.
- Our data indicates that routine reimaging within 24 hours is unlikely to change clinical management in patients with intact neurologic status even in the case of DICH.
- **Further study is required to validate these results, but they call into question the 2002 EFNS recommendations for reimaging in all traumatic brain injury patients on anticoagulation.**

Conclusion

- In patients with identified traumatic injury on supra-therapeutic warfarin (INR>3), an initial CT brain without identified intracranial hemorrhage alone is an adequate survey for hemorrhage in patients with intact neurologic status.
- Delayed hemorrhage in these patients is uncommon and repeat CT brain should be utilized when there is clinical concern for progression of bleeding or changes in GCS as opposed to routine post injury surveillance.
- There is a low rate of delayed bleeding and need for intervention.

References

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