



Use of Anticoagulant Agents after Traumatic Intracranial Hemorrhage

Keith A Kerr MD; Christopher Gerald Wilkerson; Scott R Shepard; Alex Choi MD; Ryan Seiji Kitagawa MD

The University of Texas Medical School at Houston Department of Neurosurgery



Introduction

Anticoagulant therapy (ACT) after traumatic intracranial hemorrhage may lead to hematoma expansion, but in the presence of thromboembolic events such as deep vein thrombosis (DVT) and pulmonary embolism (PE) or conditions such as atrial fibrillation, the clinician must decide if the benefits of ACT outweigh the risks. Currently, no data exist to guide therapy.

Methods

We retrospectively identified all patients admitted to our institution with traumatic intracranial hemorrhage that received intravenous heparin, full dose enoxaparin, or warfarin during their initial hospitalization over a three-year period. We reviewed their demographics, hospital course, ACT indication, timing of medication initiation relative to the trauma, and complications.

Results

A total of 74 patients were identified. The median age and GCS of these patients was 51 and 10, respectively. Twenty-two patients required neurosurgical procedures for their presenting injury including intracranial pressure (ICP) monitors and/or open surgeries. Fifty-four patients had DVTs or PEs prior to ACT, and the remaining 20 patients had pre-existing conditions or other indications for ACT.

The median time from injury to starting ACT was 8 days. Immediate complications, which included a new hemorrhage or previous hematoma progression, occurred in 6 (8.1%) patients, and

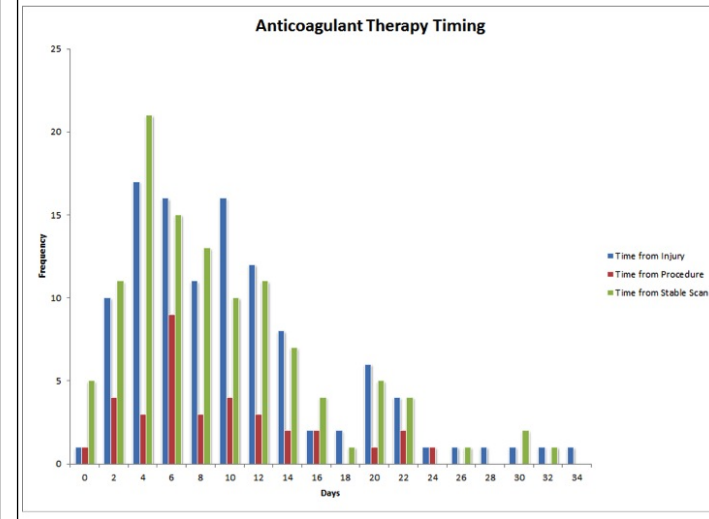
Demographics and Presenting Clinical Condition

Demographics	
Population	112
Males	84 (75%)
Age (Median)	51
Presenting Condition	
GCS severe (3-8)	50 (45%)
GCS mild/moderate (9-15)	62 (55%)
ISS (Median)	24*
Prior Anticoagulation/Antiplatelet Therapy	32 (29%)
Required Neurosurgical Procedure	36 (32%)
Anticoagulation Therapy Data	
Heparin/Enoxaparin	35 (31%)
Warfarin	6 (5%)
Heparin/Enoxaparin and Warfarin	71 (64%)
Days from injury to ACT (Median)	9
Days from procedure to ACT (Median)	7.5
Days from stable scan to ACT (Median)	7.5
Days of Anticoagulation Therapy (Median)	12

Indications for Treatment and Complications

Indication for ACT	
PE	32
DVT	58
Vein fed into SVC	36
in IVC	4
Vein fed into IVC	18
Myocardial Infarction	3
Cerebrovascular Accident	2
Total Events	101
Days from Injury to Event (Median)	8
Therapy Complications	
Acute Radiographic Complications	3 (3%)
Acute Clinical Complications	0 (0%)
Intermediate Clinical Complications	2 (2%)
Long Term Clinical Complications*	2 (2%)
Outcomes	
GOS (Median)	3
Mortality	10 (9%)

Timing of Anticoagulant Therapy



Conclusions

For this patient population, the intracranial hemorrhage risk from ACT therapy must be weighed against the morbidity of delaying treatment for thromboembolic conditions. Although further studies are ongoing, our retrospective review provides the first complication rates in head trauma patients.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Identify the rate of acute hemorrhagic complications associated with starting anti-coagulant agents within a certain time period after traumatic intracranial hemorrhage 2) Identify the rate of delayed hemorrhagic complications after initiating anti-coagulant therapy after traumatic intracranial hemorrhage