



Low Dose Prothrombin Complex Concentrate (PCC) for Reversal of Warfarin-Induced Intracerebral Hemorrhage in the Emergency Department

Jon C Kerr, MD; Stephanie Haddad, MD; Emily Kintzer, BS, BA; Natali Baner, BS; Eric Boccio, BS; Yevgeniya Goltser, BS; Andrew Chen, BA; Todd Slesinger, MD

*Department of Emergency Medicine, North Shore University Hospital, Manhasset, New York
Feinstein Institute for Medical Research, North Shore-LIJ Health System, Manhasset, New York*

smaccGOLD

Presenter: Todd L. Slesinger, MD, FACEP, FCCM, FCCP

March 19-21, 2014

Gold Coast Convention and Exhibition Centre, QLD, Australia

Background

- Emergency Departments (EDs) are seeing an increasing number of patients with Warfarin-related bleeding diatheses
- Warfarin-associated intracranial hemorrhage (ICH) is a life-threatening emergency which requires rapid normalization of the international normalized ratio (INR)
- Prothrombin Complex Concentrate (PCC) is successfully used at higher concentrations to reverse the INR
- PCC is expensive and has increasing risks associated with high dosages

Objectives

- To determine the efficacy of a low-dose regimen of PCC to treat Warfarin-associated ICH in the ED

Methods

- Retrospective chart review study (conducted at a suburban academic ED in the United States which utilizes a Quality Improvement database)
- The following information was extracted from each record:
 - Age
 - Key laboratory findings
 - Type and amount of PCC administered
 - Amount of Vitamin K administered
 - Duration of reversal
 - Hospital length of stay (LOS)
 - CT results

- **INCLUSIONS:** Patients ≥ 18 years of age, CT scan in the ED demonstrating ICH, and documented Warfarin use at the time of presentation

Results

Subject Demographics	
Total subject enrollment (n)	47
Mean subject age	77 years

PCC Administration	
Average PCC amount	853 IU
Average PCC dose	11.62 IU/kg
Minimum PCC dose	3 IU/kg
Maximum PCC dose	44 IU/kg

Plasma Administration	
Subjects receiving plasma prior to second INR (n)	28
Mode plasma dose	2 units
Minimum plasma dose	1 unit
Maximum plasma dose	3 units

Vitamin K Administration	
Subjects receiving VK (n)	36
Median dose of VK	10 mg

PCC used in all but 3 cases: BEBULIN (Factor IX Complex), Nanofiltered and Vapor Heated is a purified, sterile, freeze-dried concentrate of the Coagulation Factor IX (Christmas Factor) as well as Factor II (Prothrombin) and Factor X (Stuart-Prower Factor) and low amounts of Factor VII. It is typically considered a 3 factor PCC, and the Factor VII is NOT activated. IU's are based on Factor IX activity in 1 mL of human blood.

Results Continued

Presenting INR	
Average presenting INR	3.35
Minimum presenting INR	1.39
Maximum presenting INR	11.19

Post-PCC INR	
Average post-PCC INR	1.58
Minimum post-PCC INR	0.99
Maximum post-PCC INR	3.46

Patient Outcomes	
Patients with normalization of INR by second check (n)	17
Mean time to initial INR normalization	3.02 hours
37 patients (79%) had normalization of INR by 7.7 hours after administration of PCC	
30 patients (64%) had no change or an improving head CT after PCC	
17 patients (36%) had either worsening INR or death without a follow up head CT	
Of the 17 patients with worsened outcomes, only 6 had a normalized INR by second check	
8 head CTs were not performed because of patient death	

Discussion

- Few studies exist to guide the appropriate dosing of PCC in Warfarin-associated ICH
- Because of the inherent thrombotic risks associated with higher dosing of PCC, we suggest propose using a lower dosing profile of 10-25 IU/kg

Presenter Contact Information

Todd L. Slesinger, MD, FACEP, FCCM, FCCP

Department of Emergency Medicine

North Shore University Hospital

Manhasset, New York, USA

tslesinger@mac.com

@tslesinger