

CAT, Block #8

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Question: Are there baseline characteristics which put a patient at increased risk of VTE after administration of PCCs? Does the reason for baseline anticoagulation in a patient play a role in predicting adverse outcomes?

Felton D, et al. Risk of venous thromboembolism after receiving prothrombin complex concentrate for warfarin-associated intracranial hemorrhage. *JEM*. 2016;50(1):1-6.

Intro: Warfarin is widely used in the treatment of VTE, in the prevention of thrombus associated with atrial fibrillation, and for prosthetic heart valves. This therapy comes with an increased risk of bleeding, including intracranial hemorrhage (ICH). Prothrombin complex concentrates (PCCs) are commonly used to rapidly reverse warfarin-associated coagulopathy in the setting of life-threatening bleed, of which ICH is associated with the highest morbidity and mortality. However, PCCs have been associated with thromboembolic complications with rates ranging from 1.4% to 10% in previous studies.

Methods: Retrospective chart review of all patients with a warfarin-associated ICH who received 3F-PCC at a single tertiary care hospital between 2008 and 2013. Outcomes were VTE events (defined as DVT, PE, limb ischemia, TIA, CVA, NSTEMI, STEMI, and unexplained death) occurring within 30 days of administration. Risk factors in subjects with and without VTE complications were compared via Fisher's exact test, Student's *t*-test, Mann-Whitney *U* test, and univariate logistic regression as appropriate.

Results: Two hundred nine subjects received 3F-PCC for warfarin associated ICH. There were 22 VTE events in 19 subjects (9.1%). Baseline characteristics of subjects with and without VTE were similar. There was a significant increase in VTE events in subjects who were taking warfarin for previous PE or DVT ($n = 29$, 36.8% vs 11.6%, $p = 0.007$; logistic regression odds ratio 4.455, $p = 0.005$) and in particular, subjects with history of PE were at highest risk with 50% experiencing recurrent VTE ($n = 12$, 31.6% vs 3.2%, $p < 0.001$).

Discussion: Although baseline characteristics such as age, sex, INR prior to reversal, and medical history did not appear to place patient at increased risk for VTE, the reason for baseline anticoagulation did appear to play a role. Patients with prior history of PE or DVT who were given 3F-PCC for warfarin-associated ICH were 4.5 times more likely to sustain a VTE within 30 days. Although this article is a single center study which specifically looks at 3F-PCC in warfarin-associated ICH, it highlights the importance in considering risk factors when reversing anticoagulation, particularly making sure to include reason for baseline anticoagulation in your history taking. We now use mostly 4F-PCC and with the advent of Novel Oral Anticoagulants (NOACs) we are using PCCs for reversal of both warfarin and NOACs for multiple types of hemorrhage, including GI bleeds. The emergency physician must carefully consider the risks and benefits of this potential therapy.
