Evidence-Based Practice (EBP) - E205

Poster

Abstract Title:

The effectiveness of a Rapid Reversal Protocol for patients with anticoagulation-related intracereberal hemorrhage (ICH)

Authors:

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Background & Purpose:

Anticoagulation-related intracereberal hemorrhage (ICH) is often-fatal, timely reversal of pre-injury anticoagulation agents improves outcomes. Current severity scales cannot predict risk of deterioration. We identified several cases of deterioration among anticoagulation-related ICH patients in 2012, leading to the creation of a Rapid Response Protocol (RRP) during the first half of 2013. The protocol requires immediate International Normalized Ratio (INR) values, head Computed Tomography (CT) scans and guides use of Fresh Frozen Plasma (FFP) and other anticoagulation reversal agents. The study purpose was to assess the impact of the RRP in patients with anticoagulation-related ICH.

Study/Project Design:

We retrospectively compared activation status and time to INR, head CT scan and FFP pre vs post RRP implementation.

Setting:

Community-based, ACS-verified Level I trauma center.

Sample:

Our study included trauma patients with anticoagulation-related ICH admitted between 1/1/11 and 9/15/13.

Procedures:

On 6/1/13, our trauma department implemented the RRP to improve treatment of anticoagulation-related ICH. The protocol requires patients on pre-injury anticoagulation agents with suspected traumatic brain injury to be activated, receive an immediate head CT and INR determination, and a hospital-wide alert be issued. Positive head CT scans necessitate immediate trauma surgeon consultation. Patients with INR>1.4 receive FFP; subsequent course of action is guided by INR values and symptoms. To assess the efficacy of the protocol, we compared outcomes pre implementation (1/1/2012- 12/31/2012) and post implementation (6/1/13 – 9/15/13). Demographic variables collected included mean age, ISS and INR values; outcome variables included activation status, time to CT scan, INR and FFP. We exclusively studied patients with ICH due to our concern with the population.

Findings/Results:

Of 71 anticoagulation-related ICH patients, 66 (89.9%) were admitted prior to RRP implementation and seven (10.1%) were admitted post implementation. The groups were similar in age (72.9 vs 74.1, respectively), severity of injury (ISS 16.2 vs 16.0) and initial INR values (2.4 vs 2.5). Prior to implementation, 29.6% of anticoagulation-related ICH patients were activated; post implementation, 100% were activated. Sixty of 64 patients (93.8%) received INR values pre implementation; 6 of 7 (85.7%) patients received INR values post implementation. Time to INR decreased after implementation from 91.0 to 7.8 minutes. 85.9% and 85.8% of patients received a head CT scan pre and post-implementation; the time to head CT scan also decreased from 143.0 minutes to 53.3 minutes. Of patients with INR>1.4, time to FFP was reduced from 180.7 minutes to 74.25 minutes. Fourteen patients (21.9%) expired pre implementation; 1 of 7 patients (14.2%) expired post implementation.

Discussion/Conclusions/Implications:

Our study found RRP implementation led to considerable decreases in time to INR, head CT scan, and administration of FFP for anticoagulation-related ICH patients. By heightening the awareness of even seemingly minor trauma patients that meet RRP criteria, we are able to proactively treat potentially at-risk patients. We attribute this success to the incorporation of several clinical services and our concern for our aging trauma patient population. Despite our small sample due to the protocol's recent implementation, we expect additional patients to be included in future analyses.