

Prophylactic anticoagulation in patients with closed head injuries

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Objective: Venous thromboembolism (VTE) is a significant cause of morbidity and mortality in injured patients, but is potentially preventable using prophylactic anticoagulation. Closed head injuries and intracranial bleeding are traditional contraindications to anticoagulation. We hypothesized that protocol-driven administration of low-molecular-weight heparin to patients with these injuries could be safe and effective.

Methods: Our institution adopted an evidence-based protocol for VTE prophylaxis in February 2007 which included the administration of 30 mg of low-molecular-weight heparin subcutaneously every 12 hours to patients with closed head injuries within 48 to 72 hours after computed tomography demonstrated stable areas of intracranial hemorrhage. We queried our institution's trauma registry in June 2008 for all patients admitted between 11/02/07 and 01/31/08 with a head abbreviated injury score (AIS) of 2 or greater. We collected information from the registry and the patients' medical records including demographics, injuries, use of the prophylaxis protocol, occurrence of DVT, occurrence of new or worsened intracranial bleeding, the need for procedures related to the increase of intracranial bleeding, and survival to discharge.

Results: Out of 91 patients admitted with head AIS of at least 2, 38 (42%) were given low-molecular-weight heparin in compliance with the prophylaxis protocol. These 38 were equally (50%) male and female, and suffered predominantly (97.2%) blunt injuries. The median head AIS was 2 (range 2-5), and the median injury severity score (ISS) was 16.5 (range 5-45). The mean probability of survival (TRISS) was 84.2% (median 96.8%, range 9.6-99.6%). The average number of days it took until anticoagulation was initiated was 3.3, while the average length of anticoagulation administration was 6.6 days. After initiation of anticoagulation, 1 patient (2.4%) developed worsened intracranial bleeding, but did not need compensatory procedures for the bleeding. No patients underwent compensatory procedures due to increase in intracranial bleeding from anticoagulation administration. Three (7.3%) patients developed DVT, and no patients developed PE. 4 patients (4.4%) died prior to discharge.

Conclusions: Patients who suffer head injuries with or without intracranial bleeding may be safely and effectively treated with prophylactic low-molecular-weight heparin for the prevention of VTE as part of an evidence-based protocol. A prospective multicenter trial of this protocol may provide additional opportunity for prevention of morbidity and mortality due to VTE.