IS LOW MOLECULAR WEIGHT HEPARIN SAFE FOR VENOUS THROMBOEMBOLISM PROPHYLAXIS IN PATIENTS WITH TRAUMATIC BRAIN INJURY? A WESTERN TRAUMA ASSOCIATION MULTICENTER STUDY

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Background: Venous thromboembolism (VTE) is a significant risk in trauma patients. Although low molecular weight heparin (LMWH) is effective in VTE prophylaxis, its use in patients with traumatic brain injury (TBI) remains controversial. In order to determine the safety of LMWH in patients with TBI we conducted a multicenter retrospective study. We hypothesized that VTE prophylaxis with LMWH would not cause an increased rate of progression of intracranial bleed in TBI patients.

Methods: This was a five year review of patients suffering intracranial hemorrhage due to blunt trauma, all of whom had at least one follow-up head CT. Patients under 18 years of age; who died or were discharged within 48 hours; required emergent abdominal, thoracic, or vascular surgery; or were receiving anticoagulants prior to injury were excluded. Patients receiving LMWH who did not have a subsequent follow-up scan were also excluded. Demographic and physiologic data as well as data regarding the use and timing of LMWH, progression of bleed from initial CT scan, neurologic outcome, survival, and occurrence of VTE were collected. Patients were divided into 2 groups: patients who received LMWH and patients who did not. The primary outcome was progression of intracranial bleed. Student's t-test was applied to continuous variables, and contingency table analysis to dichotomous variables, with $p<0.05$ considered significant.

Results: 1215 patients were included in this study. 220 patients (18.1%) received prophylactic LMWH, and 995 (81.9%) did not (control). The LMWH group was younger (46 vs. 53 years), with more severe injury (ISS 28 vs. 21), and presented with worse GCS (8 vs. 11) than the control population. 239 of 995 control group patients (24%) were found to have progressive bleed on follow-up CT scans. In the LMWH group, 93 of 220 patients (42%) were found to have progression on follow-up CT scans ($p=0.002$). Ten percent (14/137) of patients who initially had stable serial CT scans had bleed progression after LMWH administration.

Conclusion: This retrospective study demonstrates a higher rate of progression of intracranial bleed in TBI patients receiving prophylactic LMWH. Although the patients receiving LMWH were more severely injured than the control group, these results do not support the hypothesis that LMWH is safe for VTE prophylaxis in this population. A prospective randomized controlled study is required to validate these findings.