Heparin vs. enoxaparin for venous thromboembolism prophylaxis in acute ischemic stroke

Authors: Seyoum, B, Roels C, Bryan M.
Practice Site: Novant Health Presbyterian Medical Center, Charlotte, NC; Novant Health Forsyth Medical Center, Winston Salem, NC

Background: Venous thromboembolism (VTE) prophylaxis is an important component of acute ischemic stroke management for immobile patients. The choice of enoxaparin or subcutaneous heparin for VTE prophylaxis is unclear due to lack of consistent data indicating the superiority of one agent.

Objective: The primary objective of this study was to compare incidence of VTE in a cohort of patients with acute ischemic stroke on enoxaparin vs heparin prophylaxis. The secondary objective was to compare risk of bleeding and all-cause mortality between these groups.

Methods: This was a multicenter retrospective chart review of acute ischemic stroke patients that received either enoxaparin or subcutaneous heparin for VTE prophylaxis during the period of January 1, 2019 to June 30, 2021 at two comprehensive stroke centers. Patients were identified through an electronic medical record report and screened for inclusion in order to reach 200 patients in each group. The primary endpoint was composite VTE events within 30 days or discharge. Secondary safety endpoints included intracranial hemorrhage, major extracranial hemorrhage and 30-day all-cause mortality.

Results: A total of 674 patients were screened for inclusion and exclusion criteria which were met in 187 patients in the heparin group and 190 patient in the enoxaparin group. Baseline characteristics were similar between the two groups regarding demographics. However, patients that received heparin had higher mean National Institutes of Health Stroke Scale (NIHSS) scores ($p<0.01$) and were more likely to have received a thrombolytic and/or thrombectomy ($p<0.01$). The primary outcome of composite VTE events was seen in 5 (2.7%) patients that received heparin and 1 (0.5%) patient that received enoxaparin for VTE prophylaxis ($p=0.1$). The secondary safety outcome of extracranial bleeding was observed in 2 (1%) patients receiving heparin and in 0 patients receiving enoxaparin for VTE prophylaxis. There was no incidence of intracranial hemorrhage seen in either group. All-cause mortality within 30 days was observed in 13 (6.5%) patients in the heparin group and 6 (3.2%) patients in the enoxaparin group ($p=0.09$).

Conclusion: There was no difference observed in primary and secondary outcomes between heparin and enoxaparin when used for VTE prophylaxis in patients with acute ischemic stroke. However, the small sample size and lack of severe stroke patients limited detection of a true difference in efficacy and safety between heparin and enoxaparin. In this study, heparin was used more in patients with higher NIHSS scores and following intervention with either thrombolytic, surgery or both. This study indicated both heparin and enoxaparin are acceptable for VTE prophylaxis following an acute ischemic stroke, but further study is warranted.