Evaluation of weight-based dosing of heparin and enoxaparin for venous thromboembolism prophylaxis in patients weighing >100kg

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Background:

The development of venous thromboembolism (VTE) in hospitalized patients is associated with an increase in morbidity, mortality, length of stay, and cost. Current CHEST guidelines recommend pharmacological thromboprophylaxis for acutely ill hospitalized patients. Although common chemoprophylaxis against VTE include subcutaneous unfractionated heparin (UFH) and enoxaparin, it is unclear if FDA-approved doses for VTE prophylaxis are adequate in the setting of obesity. On September 1, 2015, the University of Virginia Health System (UVA) implemented recommendations for increased doses of UFH and enoxaparin for VTE prophylaxis based on weight for obese patients. The purpose of this study was to evaluate the safety and efficacy of weight-adjusted dosing of subcutaneous UFH and enoxaparin for VTE prophylaxis in the obese population.

Methods:

This was a single center, retrospective study of adult patients ≥ 100 kg that received subcutaneous UFH or enoxaparin from March 1, 2015 to March 1, 2016. Patients were identified through reports generated from the Epic Clarity application and were divided into two groups: pre-intervention (n=2,080) and post intervention (n=1,243). A full chart review was performed for patients identified to have a diagnosis of a VTE or bleed by meaningful use criteria to determine if either outcome occurred during hospital admission. The primary endpoint of this study was the prevalence of VTE before and after implementation of the weight-adjusted dosing recommendations. Secondary endpoints included prevalence of major and minor bleeds, and mortality related to VTE and bleeding prevalence.

Results:

Outcomes were compared between all patients receiving any dose of UFH or enoxaparin for VTE prophylaxis pre-intervention and those receiving weight-adjusted doses of each post-intervention. There was a significant decrease in prevalence of VTE in the post-intervention group (0.005% vs. 0.001% p = 0.02). Eight deep vein thromboses (DVTs) and three pulmonary embolisms (PEs) developed in the pre-intervention group while only one DVT occurred in the post-intervention group. There were no significant differences in overall bleeding between the pre- and post-intervention groups (0.002% vs. 0.001% p = 0.622), nor was there a difference in prevalence of major or minor bleeds. There was no significant difference in mortality (p=0.171).
Conclusion:

Weight-adjusted dosing of subcutaneous UFH and enoxaparin in the obese population resulted in a significant decrease in the prevalence of hospital-acquired VTEs with no increased risk in bleeding. Based on our findings, UVA will continue to recommend weight-based doses of UFH and enoxaparin for VTE prophylaxis in the obese population. Larger, prospective studies are needed to further validate our findings of the safety and efficacy of increased doses of UFH and enoxaparin for VTE prophylaxis in obese patients.