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Title: *Enoxaparin anti-factor Xa level monitoring and coinciding dose adjustments*

Abstract

Purpose

Anti-factor Xa level monitoring for enoxaparin is not usually recommended in the general population. In certain populations with obesity or renal impairment, it may be a useful tool to ensure safety of preventing bleeding and efficacy of therapeutic treatment doses. The purpose of this study was to evaluate the utility of anti-factor Xa monitoring and its impact on current practice.

Methods

The institutional review board approved this single centered retrospective review of anti-factor Xa levels and enoxaparin dosing. Patients 18 years and older who were admitted to the hospital between June 1, 2016 and June 1, 2019 and had an anti-factor Xa level checked while receiving enoxaparin were included in the study. Patients were excluded from the study if they were using any anticoagulant other than enoxaparin at the time of anti-factor Xa monitoring, if they were being treated for acute coronary syndrome, or if they were undergoing a percutaneous intervention. The primary outcome was to identify the appropriateness of anti-factor Xa levels drawn and what dose changes coincide with the resulting level. Secondary outcomes include the appropriateness of initial dose, reason for anticoagulation, risk factors for development of venous thromboembolism, and adverse effects including bleeding and thrombosis. Descriptive statistics were performed on the data.

Results

Eighty-seven patients were included in the primary evaluation and twenty-two patients were excluded due to use of other anticoagulants not including enoxaparin. The patients included were using anticoagulation for deep vein thrombosis, pulmonary embolism, both deep vein thrombosis and pulmonary embolism, atrial fibrillation, venous thromboembolism prophylaxis, and various other disease states. Due to readmissions among the eighty-seven patients, there were ninety-three eligible anti-factor Xa levels drawn. Obesity was the most common risk factor present in patients who had an anti-factor Xa level checked with 77% (67/87) of patients being obese. Patients with renal dysfunction defined as creatinine clearance of less than 30 ml/min at the time of anti-factor Xa draw represented 7% (6/87) of the patient population. Only 32% (30/93) of the initial anti-factor Xa tests performed were within the recommended time range of 4-6 hours after a steady state dose. Dose changes occurred after an anti-factor Xa level draw 24% (22/93) of the time. Dosage adjustments were appropriate 31% (29/93) of the time and inappropriate 18% (17/93) of the time.

Conclusion

The results of this study show that anti-factor Xa levels are not always effectively monitored and utilized. Anti-factor Xa level monitoring resulted in a change in therapy 24% of the time when a level was drawn. More evidence is needed to determine what patient specific factors should warrant an anti-factor Xa level. There is an opportunity to educate providers and pharmacists to improve timing of levels and utilization of the level to improve patient care.