

## **Assessment of empiric body mass index-based thromboprophylactic dosing of enoxaparin after bariatric surgery: evidence for dosage adjustment using anti-factor Xa in high-risk patients**

### **ABSTRACT**

Background: Despite thromboprophylaxis, postoperative deep vein thrombosis and pulmonary embolism occur after bariatric surgery, perhaps because of failure to achieve optimal prophylactic levels in the obese population. Objectives: The aim of this study was to evaluate the adequacy of prophylactic dosing of enoxaparin in patients with severe obesity by performing an antifactor Xa (AFXa) assay. Setting: An academic medical center. Methods: In this observational study, all bariatric surgery cases at an academic center between December 2016 and April 2017 who empirically received prophylactic enoxaparin (adjusted by body mass index [BMI] threshold of 50 kg/m<sup>2</sup>) were studied. The AFXa was measured 3–5 hours after the second dose of enoxaparin. Results: A total of 105 patients were included; 85% were female with a median age of 47 years. In total, 16 patients (15.2%) had AFXa levels outside the prophylactic range: 4 (3.8%) cases were in the subprophylactic and 12 (11.4%) cases were in the supraprophylactic range. Seventy patients had a BMI <50 kg/m<sup>2</sup> and empirically received enoxaparin 40 mg every 12 hours; AFXa was subprophylactic in 4 (5.7%) and supraprophylactic in 6 (8.6%) of these patients. Of the 35 patients with a BMI ≥50 who empirically received enoxaparin 60 mg q12h, no AFXa was subprophylactic and 6 (17.1%) were supraprophylactic. Five patients (4.8%) had major bleeding complications. One patient developed pulmonary embolism on postoperative day 35. Conclusion: BMI-based thromboprophylactic dosing of enoxaparin after bariatric surgery could be suboptimal in 15% of patients with obesity. Overdosing of prophylactic enoxaparin can occur more commonly than underdosing. AFXa testing can be a practical way to measure adequacy of pharmacologic thromboprophylaxis, especially in patients who are at higher risk for venous thromboembolism or bleeding.

**Keyword:** Bariatric surgery; Body mass index; Deep vein thrombosis; Pulmonary embolism; Thromboembolism; Prophylaxis; Antifactor Xa; Enoxaparin; Heparin; Low molecular weight heparin