Therapeutic Enoxaparin Dosing in Obese Patients

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BACKGROUND

- The recommended dose of enoxaparin for venous thromboembolism (VTE) treatment is 1 mg/kg subcutaneously every 12 hours or 1.5 mg/kg once a day[1]
- There is little guidance on the appropriate therapeutic dose of enoxaparin in patients with a BMI > 30 kg/m^2
- The 2016 CHEST guidelines do not make any recommendations on treatment dosing for VTE in obese patients[2]
- Recent studies[3-6] suggest a lower dose of enoxaparin ranging from 0.75-0.95 mg/kg BID may be an appropriate therapeutic dose for patients with VTE and a BMI ≥ 40 kg/m^2
- At SSM Health St. Mary's Hospital – St. Louis (SM-SL), our policy states patients with a BMI > 40 kg/m^2 should receive 1 mg/kg every 12 hours unless their weight is > 190 kg. If weight is > 190 kg, a heparin drip is recommended
- The purpose of this study is to describe the dose of enoxaparin currently being used in patients who require VTE treatment and are morbidly obese at SM-SL

METHODS

- Retrospective, single-center, chart review of patients admitted at SM-SL from January 1, 2016 through August 31, 2020

Inclusion Criteria:

- Patients ≥ 18 years old who were admitted at SM-SL between January 1, 2016 and August 31, 2020
- Received at least 2 doses of therapeutic enoxaparin for the treatment of venous thromboembolism
- BMI ≥ 40 kg/m^2

Exclusion Criteria:

- Pregnant patients
- Patients receiving dialysis

Primary Outcome:

- Dose (mg/kg) of enoxaparin received

Secondary Outcomes:

- Bleeding events (major and minor bleeding)
- Thromboembolic events
- Anti-Xa level when available

RESULTS

- No anti-Xa levels were available

Table 1. Baseline Characteristics*

Characteristic	Population (n=158)
Mean Age, years	53.6 ± 12.7
Male, n (%)	44 (27.8)
Height, cm	169.4 ± 9.5
Weight, kg	139.6 ± 21.3
Body Mass Index, kg/m^2	48.7 ± 7.0

*Plus-minus values are means ± SD

Table 2. Concomitant Medication Use

Medication	Population (n=158)
Increase Bleed Risk	
Warfarin	81 (51.3)
Aspirin	47 (29.7)
Systemic Steroids	30 (19.0)
DOACs	1 (0.6)
NSAIDs	20 (12.7)
P2Y12 Inhibitors	9 (5.7)
Increase Thrombotic Risk	
Estrogens	6 (3.8)
Progestins	18 (11.4)

Table 3. Comorbidities

Comorbidity	Population (n=158)
Factor V Deficiency	0
Factor V Leiden Mutation	3 (1.9%)
APLAS*	7 (4.4%)
Malignancy	29 (18.4%)

*APLAS: antiphospholipid antibody syndrome

Table 4. Primary Outcome

	Dose of Enoxaparin (mg/kg)
Mean Dose ± SD	0.98 ± 0.08
Minimum Dose	0.52
Maximum Dose	1.24

Table 5. Secondary Outcomes

Adverse Events	Population (n=158)
Bleeding Events	19 (12.0)
Major	3 (1.9)
Minor	16 (10.1)
Thromboembolic Events	0

- Three patients who received enoxaparin should have received heparin per our policy

LIMITATIONS

- Retrospective, single-center design limits external validity
- Weight used was the most recent weight at the time the enoxaparin was ordered (stated vs. actual)
- Secondary outcomes were only available if patient was seen/admitted at a local facility
- Conditions associated with increase bleed/thromboembolic risk determined based on chart review

CONCLUSIONS

- The average dose of enoxaparin used in obese patients (BMI ≥ 40 kg/m^2) with VTE at SM-SL is 0.98 mg/kg BID
- Bleeding events occurred in 12% of the patients with the majority of them being minor (10.1%), and there were no thromboembolic events
- Prospective studies analyzing the relationship between dose of enoxaparin used and bleeding and thromboembolic events are needed to determine the most appropriate dose for obese patients

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DISCLOSURES

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.