Single Center Experience with Venous Thromboembolism Prophylaxis for Obese Burn Patients

CONCLUSION

Current utilization of a fixed 40 mg twice daily regimen of enoxaparin for VTE prophylaxis is inadequate to meet target prophylactic peak plasma anti-Xa levels in the obese burn patient population

SIGNIFICANCE

Dose adjusting enoxaparin to target peak plasma anti-Xa levels to reduce VTE rates in obese burn patients should be further evaluated

INTRODUCTION

- Burn injured patients are at high risk of thromboembolic complications
- Inadequate prophylactic enoxaparin dosing in the surgical patient population has been associated with an increase in venous thromboembolism (VTE) events
- Previous studies have shown that acutely burned patients require higher than standard dosing of enoxaparin for VTE prophylaxis
- Factors such as BMI, gross weight, renal function and % total body surface area (%TBSA) have been shown to affect enoxaparin metabolism and impact overall enoxaparin dosing
- Recent evidence supports the use of anti-Xa guided enoxaparin dosing for prevention of VTE in high risk populations, including burns
- Paucity of data evaluating anti-Xa guided prophylaxis specifically in obese burn patients

METHODS

- Retrospective, single-center study with patient data points collected from electronic medical record review and burn registry database (November 2018- September 2019) after initiation of an enoxaparin dosing protocol for VTE prophylaxis in obese burn patients
- Inclusion criteria: ≥18 years of age, body mass index (BMI) ≥ 30 kg/m^2 or ≥ 100 kg, received at least three sequential doses of enoxaparin with appropriately timed peak plasma anti-Xa levels (3-5 hours after last dose)
- Exclusion criteria: pregnancy, CrCl <30 ml/min, dialysis, treatment dose enoxaparin, non-thermal injuries, inappropriate timing of peak plasma anti-Xa levels
- Statistical analysis was performed with student's t-test for continuous data and Fisher's exact test for categorical data

RESULTS

Table 1:

Patient Demographics (n=43)

Age (yr)	44 (19 – 76)
Male	29 (67.4)
Weight (kg)	112.0 (80.6 – 201.8)
Height (cm)	177.8 (157.5 – 194.0)
BMI (kg/m^2)	37.1 (30.3 – 63.8)
TBSA (%)	4.0 (0.5 – 60)
>20% TBSA	6 (14.0)
CrCl (ml/min)*	144 (59 – 300)
ICU LOS (days)	0 (0 – 170)
Hospital LOS (days)	10 (1 – 343)
Significant bleeding / VTE	0 (0)

Data are shown as median (range) or n (%)
*CrCl taken on date of enoxaparin initiation (utilizing adjusted body weight)

Figure 1:

Patients requiring anti-Xa level guided dosage adjustment

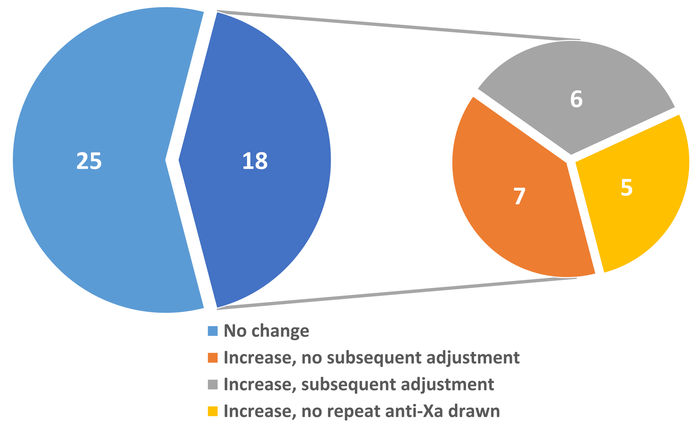


Table 2:

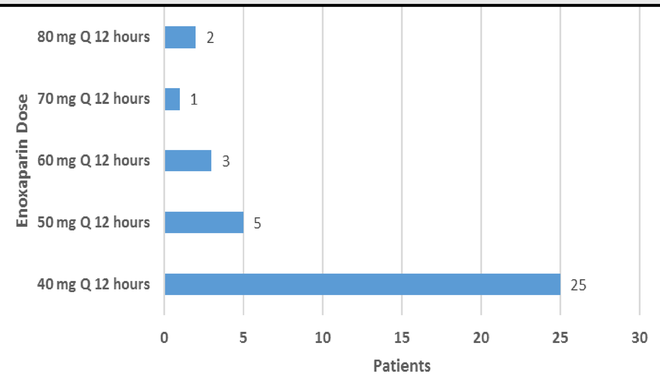
Factors associated with meeting initial prophylactic target anti-Xa with enoxaparin 40 mg Q 12 hours

	Goal anti-Xa (n=25)	Required Adjustment (n=18)	P-value
Age (yr)	42 ± 15	48 ± 14	0.1740
Sex, male	12 (48.0)	17 (94.4)	*0.0023*
Weight (kg)	110.0 ± 16.0	129.3 ± 24.0	*0.0029*
BMI (kg/m^2)	36.9 ± 4.7	39.2 ± 8.4	0.2712
TBSA (%)	5.5 ± 5.6	11.4 ± 15.1	0.0786
CrCl (mL/min)*	146.3 ± 53.2	142.9 ± 43.5	0.8283

Data are shown as mean ± standard deviation or n (%)
*CrCl taken on date of enoxaparin initiation (utilizing adjusted body weight)

Figure 2:

Final enoxaparin doses with anti-Xa level within range*



*7 patients did not have final anti-Xa levels to evaluate final dose above 40 mg Q 12 hours

LESSONS LEARNED

- Single center, retrospective study with small sample size
- Importance of a protocolized approach to VTE prophylaxis
- Consider weight-based/higher fixed dosing in patients ≥ 120 kg

References:
Lin H, Faraklas I, Saffle J, et al. Enoxaparin dose adjustment is associated with low incidence of venous thromboembolic events in acute burn patients. J Trauma 2011; 71: 1557-61.
Lin H, Faraklas I, Cochran A, et al. Enoxaparin and anti-factor Xa levels in acute burn patients. J Burn Care Res 2011; 32: 1-5
Pannucci CJ, Prazak AM, Scheefer M. Utility of anti-factor Xa monitoring in surgical patients receiving prophylactic doses of enoxaparin for venous thromboembolism prophylaxis. Am J Surg 2017; 213: 1143-52

Brian McKinzie PharmD[1], Rabia Nizamani MD[2], Samuel Jones MD[2], Felicia Williams MD[2]

[1]UNC Medical Center Pharmacy Services, [2]UNC Medical Center Department of Surgery

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