

Assessment of enoxaparin thromboprophylaxis dosing and anti-factor Xa levels in low-weight patients

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BACKGROUND

- Fixed prophylactic doses of enoxaparin in low-weight patients may pose an increased risk of bleeding and prolonged hospitalization¹
- Peak anti-factor Xa levels and bleeding events may be used to monitor the efficacy and safety of enoxaparin, respectively²
- Target anti-factor Xa levels for VTE prophylaxis are not well-established, however, studies have reported a range of 0.2 to 0.5 units per milliliter (mL)³⁻⁴
- Current literature regarding whether or not there is a correlation between anti-factor Xa levels is conflicting^{2-3,5-6}
- Literature regarding the relationship between anti-factor Xa levels and body weight in low-weight patients is limited

AIM

To evaluate peak anti-factor Xa levels in low-weight patients receiving enoxaparin for VTE prophylaxis

Specific Objectives

- Determine factors associated with peak anti-factor Xa levels Determine the correlation between body mass index (BMI) and actual body weight (ABW) with peak anti-factor Xa levels

ENDPOINTS

Primary endpoint

- Percentage of therapeutic peak anti-factor Xa levels within goal range of 0.2 to 0.5 units/mL for VTE prophylaxis

Secondary endpoint

- Percentage of patients achieving therapeutic anti-factor Xa levels based on gender, BMI, ABW and dosing regimens
- Correlation between peak anti-factor Xa levels and ABW or BMI
- Bleeding event after any dose of enoxaparin

METHODS

- Retrospective chart review
- Electronic medical records of patients admitted to any Loma Linda University Health inpatient facility between January 1, 2008 through August 24, 2015

Table 1: Inclusion Criteria

- Adults between 18 and 89 years of age
- BMI < 18.5 kilograms per meters squared (kg/m²)
- Received enoxaparin for VTE prophylaxis
- Measured peak anti-factor Xa level after one enoxaparin

Exclusion Criteria

- Concomitant use of other anticoagulants
- Creatinine clearance (CrCl) < 30 milliliters per minute (mL/min)
- Active major bleeding
- Thrombocytopenia (platelets < 100,000 per millimeters cubed)

DATA ANALYSIS

- Spearman's correlation between peak anti-factor Xa levels with BMI and ABW
- Chi-square tests to determine factors associated with peak anti-factor Xa levels

Table 2: Baseline Characteristics

Mean age (years)	36.0 ± 23.6
Mean actual body weight (kg)	38.4 ± 13.2
Mean BMI (kg/m ²)	15.8 ± 2.4
Gender	
Male	4 (50.0%)
Female	4 (50.0%)

Figure 1: Peak Anti-factor Xa Levels

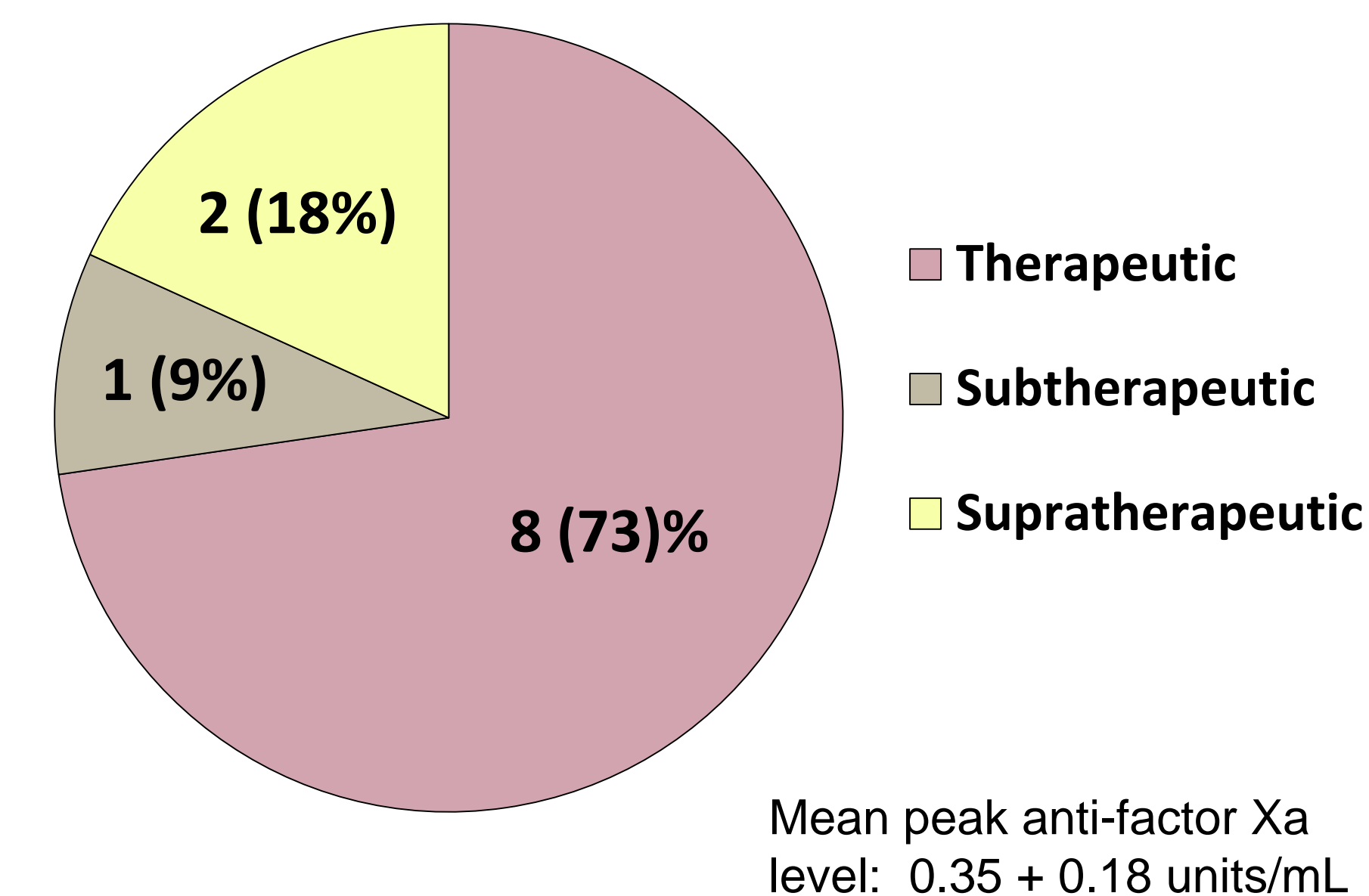


Figure 2: BMI and Peak Anti-factor Xa Levels

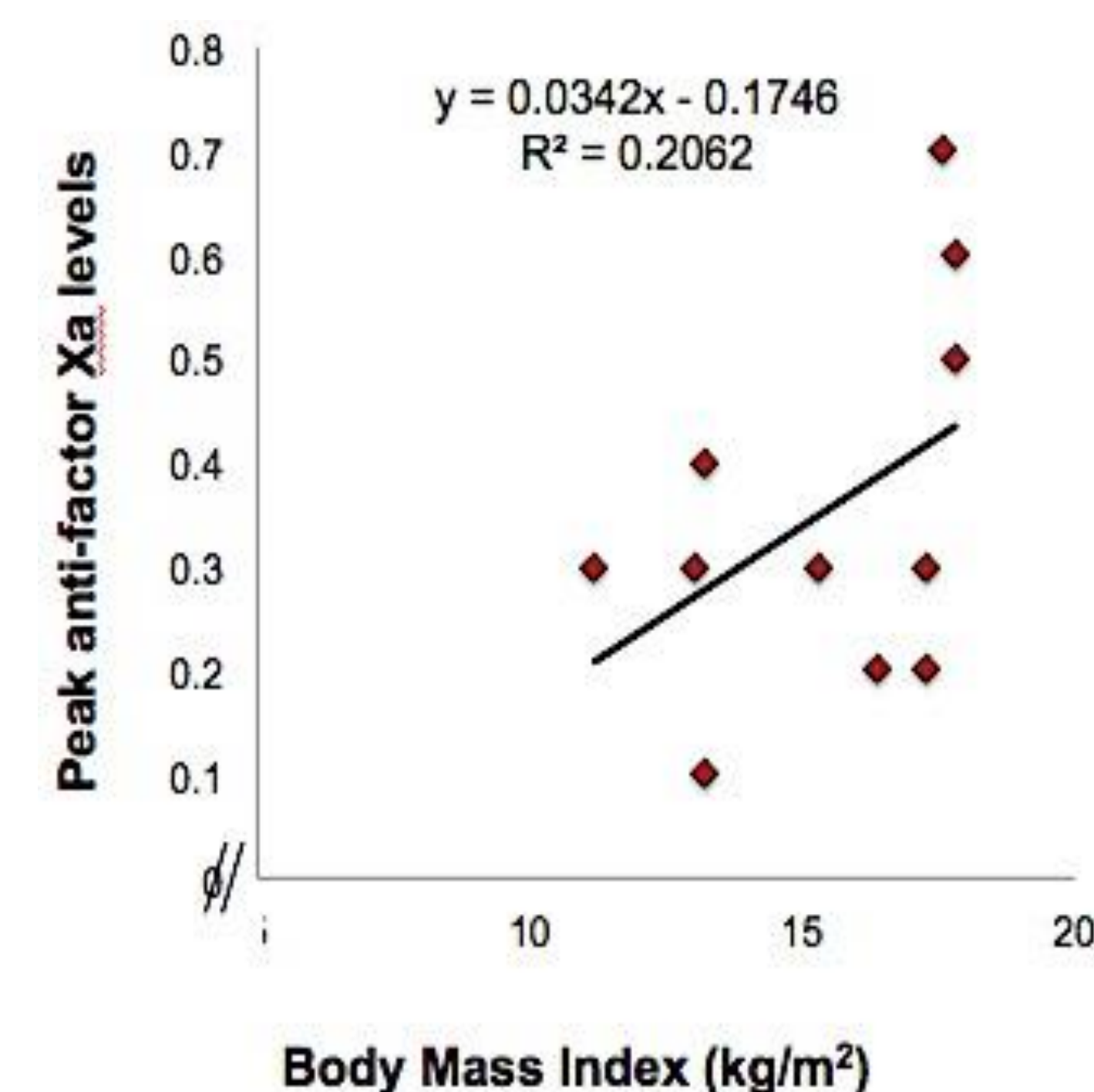


Figure 3: ABW and Peak Anti-factor Xa Levels

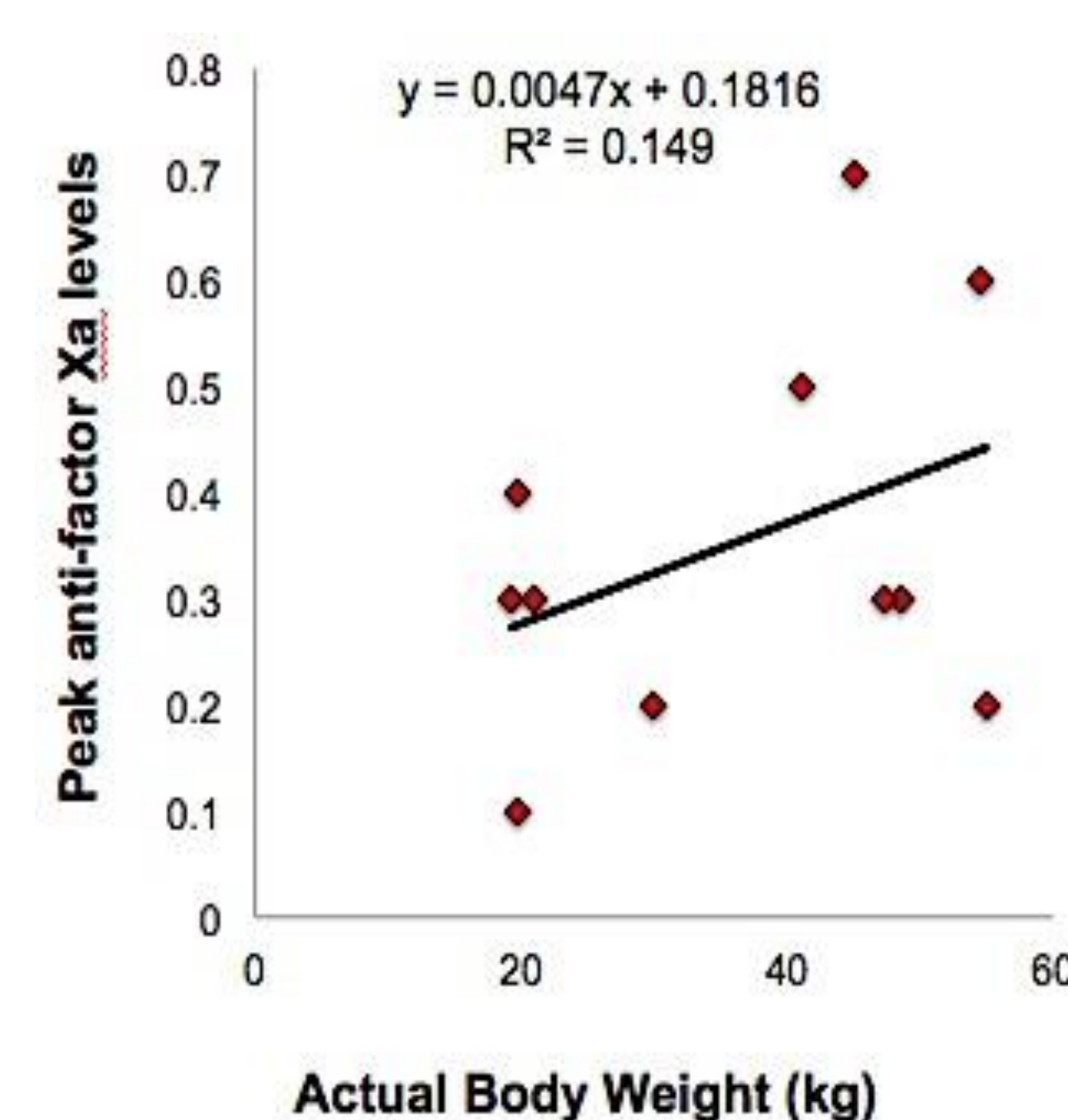


Figure 4: BMI and Peak Anti-factor Xa Levels

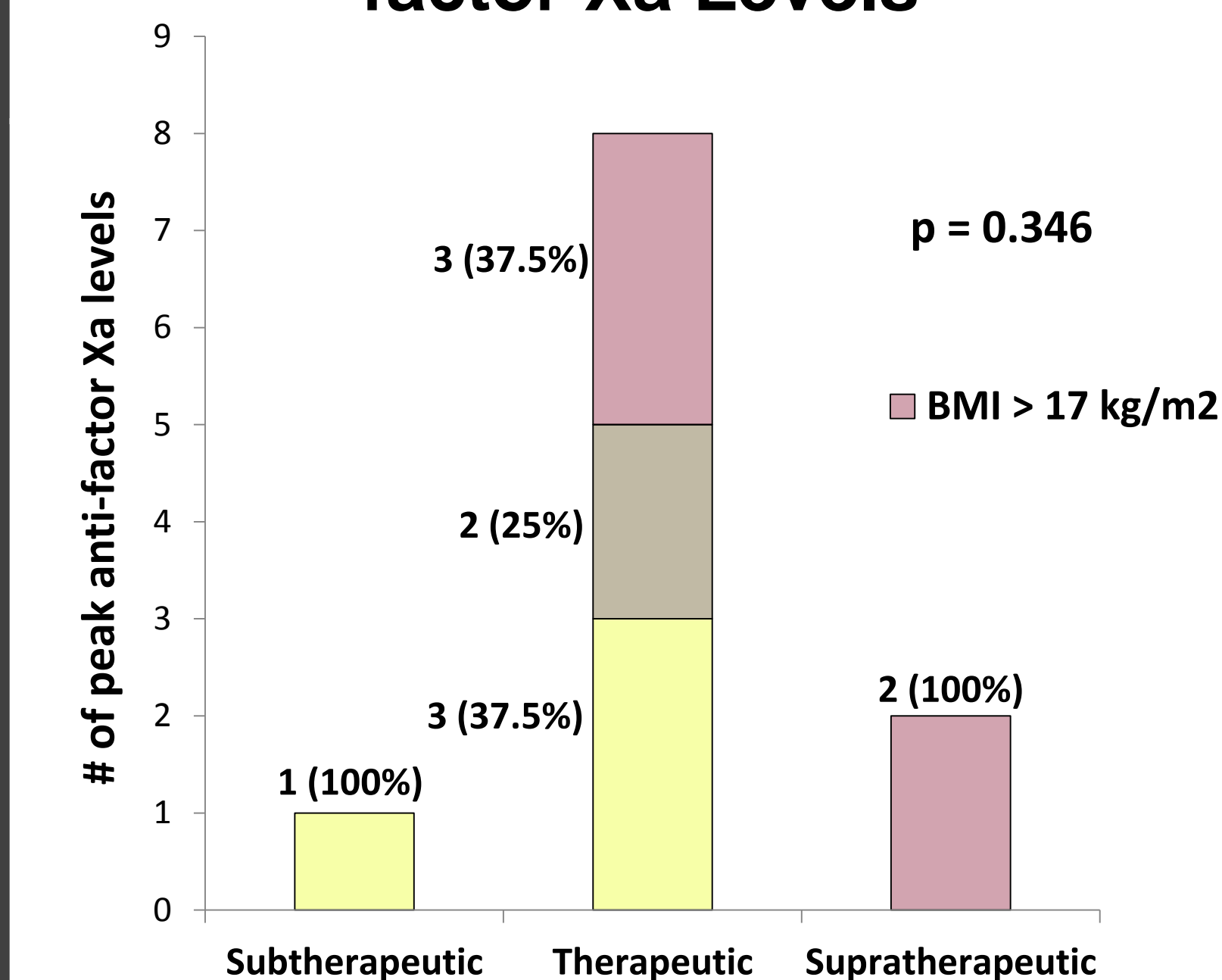


Figure 5: ABW and Peak Anti-factor Xa Levels

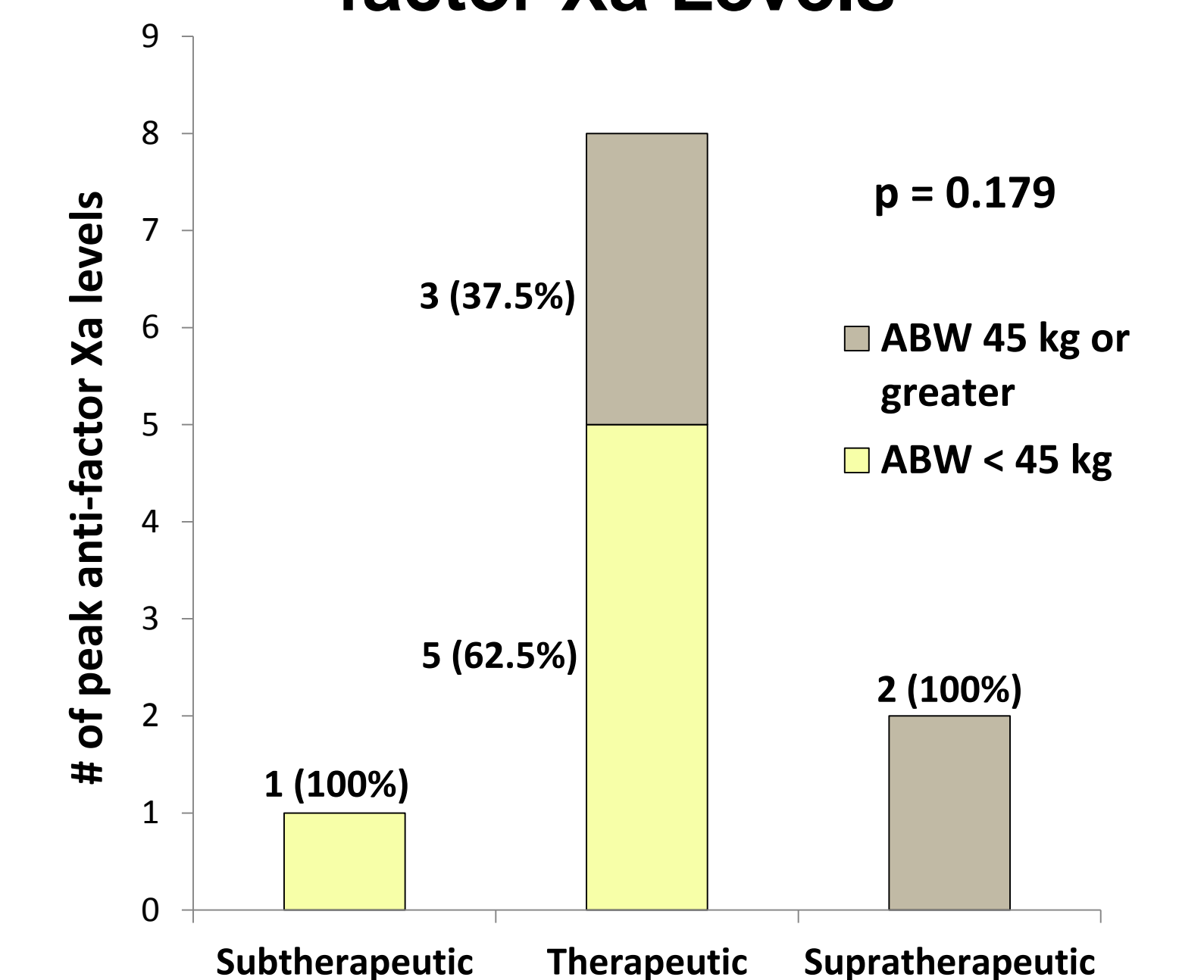


Figure 6: Gender and Peak Anti-factor Xa Levels

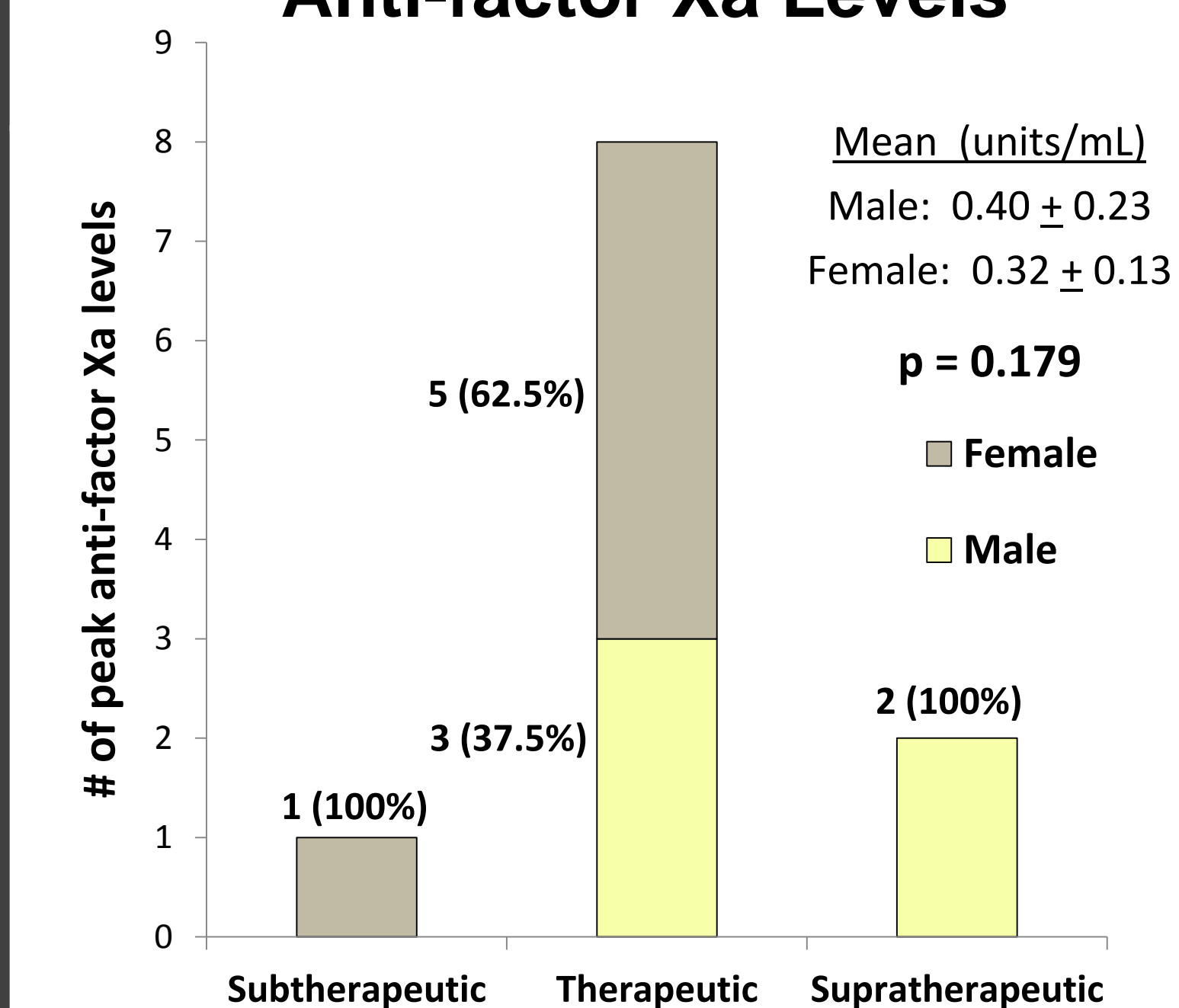
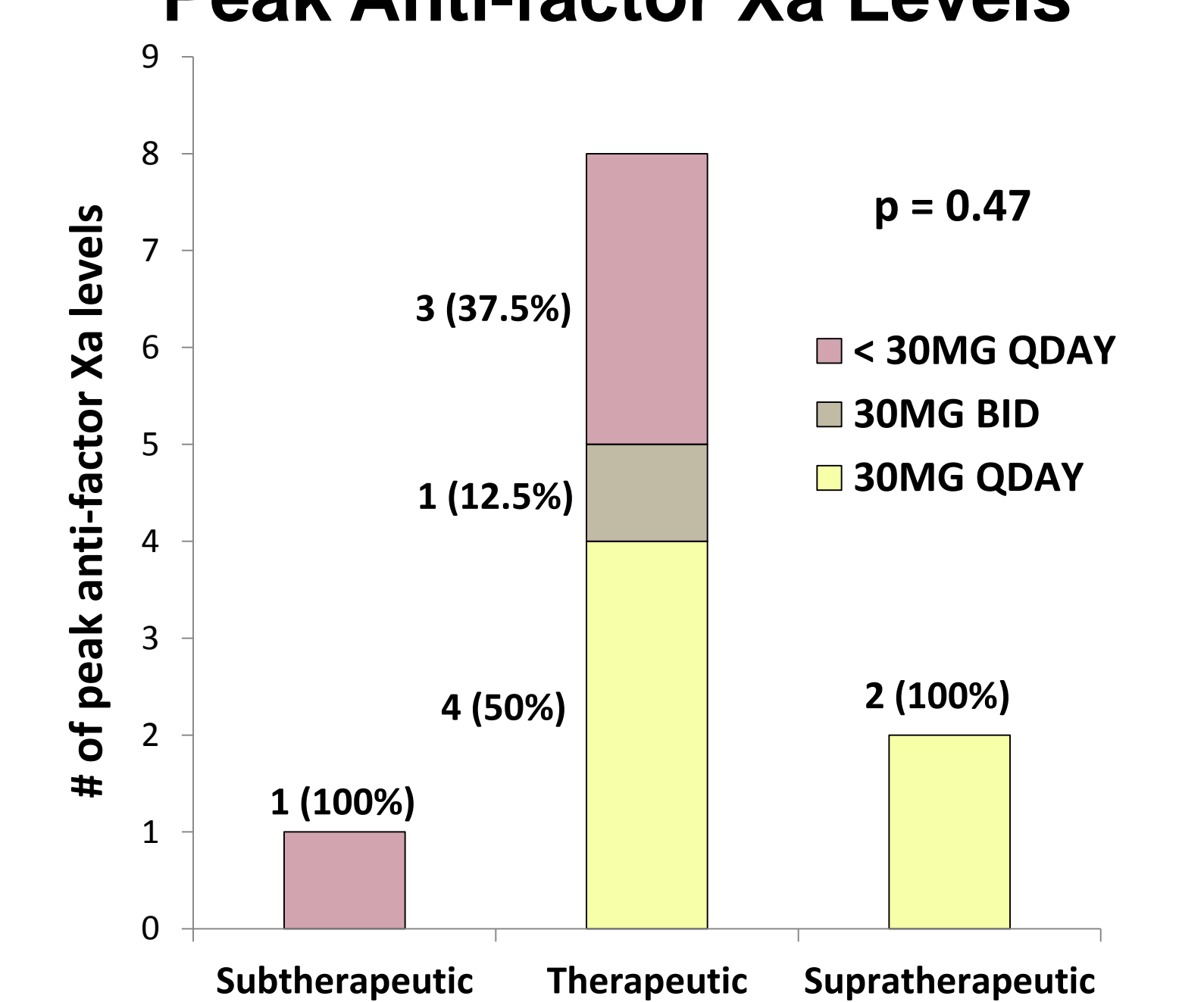


Figure 7: Dosing Regimen and Peak Anti-factor Xa Levels



Safety Outcome

- 1 bleeding event was observed in patient with a peak anti-factor Xa level of 0.3 units/mL

CONCLUSIONS

- Daily enoxaparin doses < 40 mg for VTE prophylaxis appear to provide peak anti-factor Xa levels that are mostly within goal of 0.2 – 0.5 units/mL
- Anti-factor Xa levels were not associated with gender, actual body weight or BMI, however results were significantly limited by small sample size
- Large prospective studies are needed to determine efficacy and safety of fixed doses of enoxaparin for VTE prophylaxis in low-weight patients

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