

Background

One of the most common clinical monitoring parameters for the anticoagulant effects of heparin infusions is the anti-factor Xa assay. A rising concern exists amongst clinicians about the effects of direct oral anticoagulants (DOACs) on the anti-factor Xa assay. Although there is limited literature regarding these effects, studies suggest that DOACs may influence initial Xa levels to supratherapeutic values.^{1,2} These studies lack long term monitoring of anti-factor Xa levels after the last administration of a DOAC, inclusion of multiple DOAC agents, and safety data for the identified supratherapeutic levels.

Objective

- To determine the impact of DOACs on anticoagulation monitoring of heparin infusions through anti-factor Xa assays

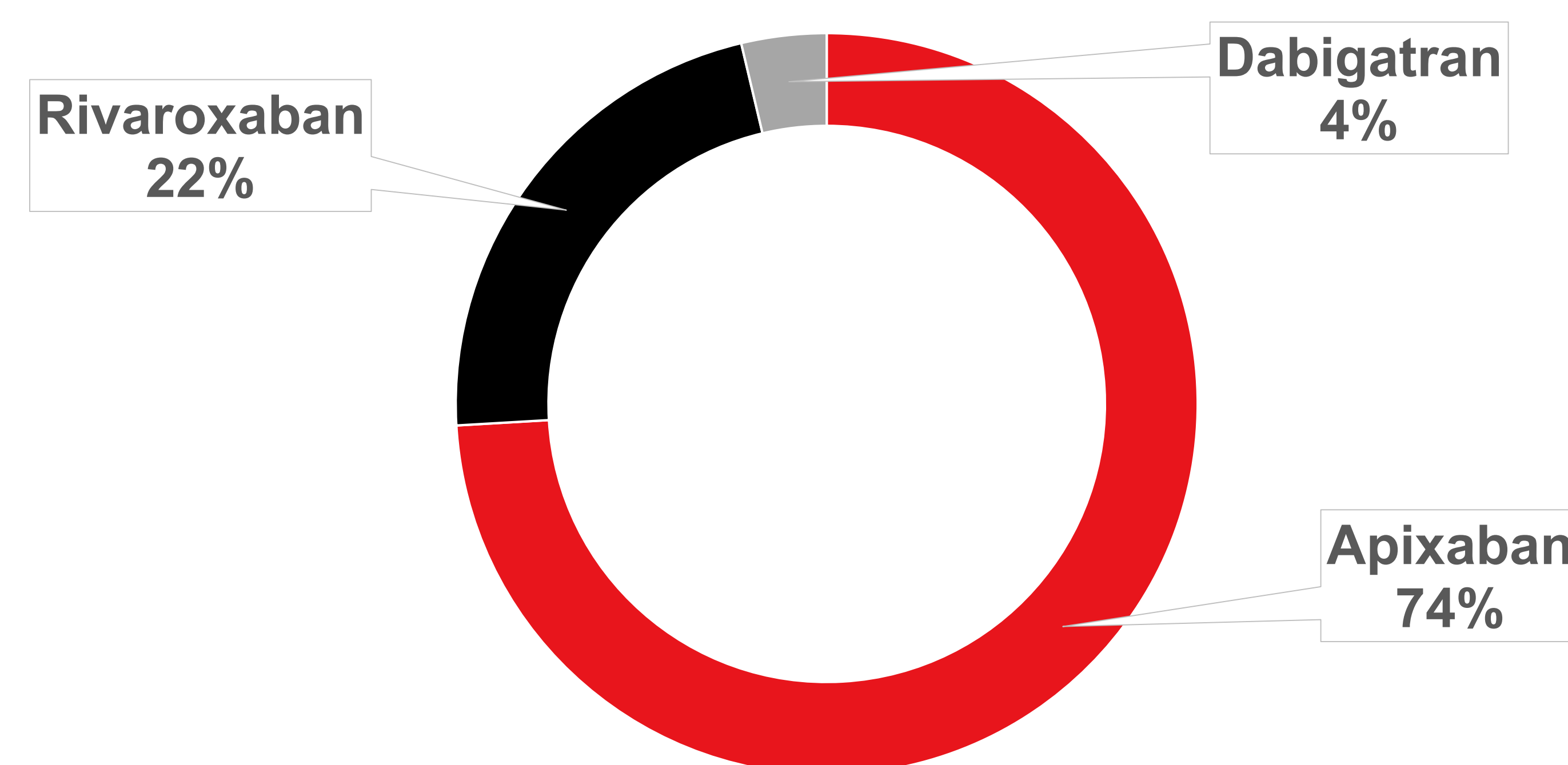
Methods

- Design:** retrospective chart review and obtained local institutional review boards approval
- Collection Period:** September 1, 2019 to April 30, 2020
- Data Collected:** weight, age, heparin dose and indication, anti-factor Xa levels, and current DOAC agent, dose, and indication
- Inclusion Criteria:** patients over the age of 18 years old on either apixaban, betrixaban, dabigatran, edoxaban, or rivaroxaban prior to receiving an intravenous heparin infusion
- Primary Outcome:** initial anti-Xa level on heparin infusion defined as within, below, or above the goal anti-Xa range
 - Goal Ranges:** medical treatment: 0.3 to 0.7 IU/mL and acute coronary syndrome (ACS): 0.3 to 0.5 IU/mL
- Secondary Outcomes:** mean time to therapeutic goal, defined as at least two consecutive anti-Xa levels within goal range while on a heparin infusion and mean baseline anti-Xa levels before start of heparin infusions

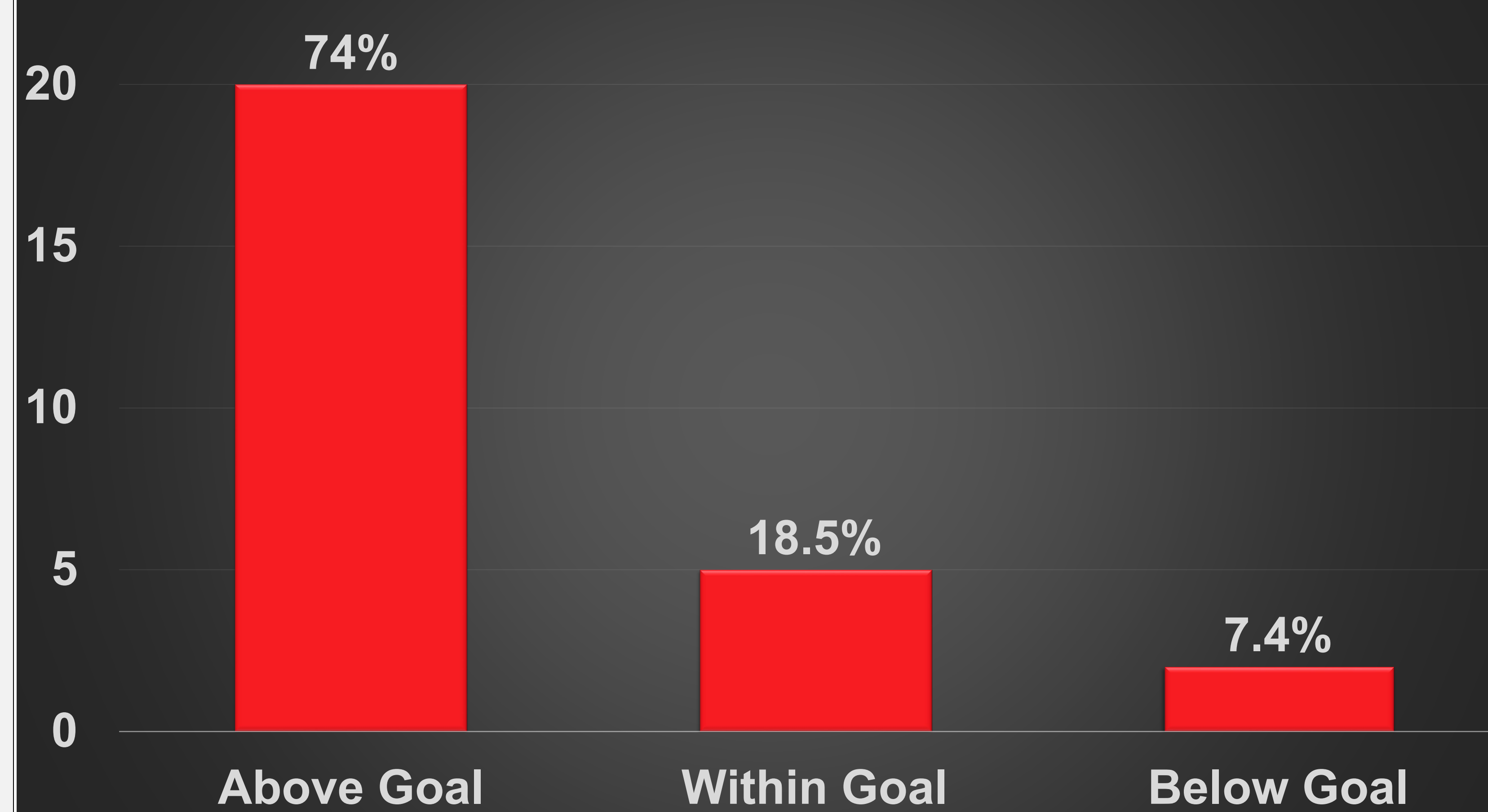
Results

- Inclusion criteria was met by 27 patients
 - Medical heparin infusion: 22
 - ACS heparin infusion: 5
 - Average age: 73 years old
 - Average weight: 96.5 kg
- Heparin bolus given prior to infusion: 59% (16/27)
 - Medical: 54.5% (12/22)
 - ACS: 80% (4/5)

DOAC use prior to heparin infusion



Initial anti-Xa level while on the heparin infusion

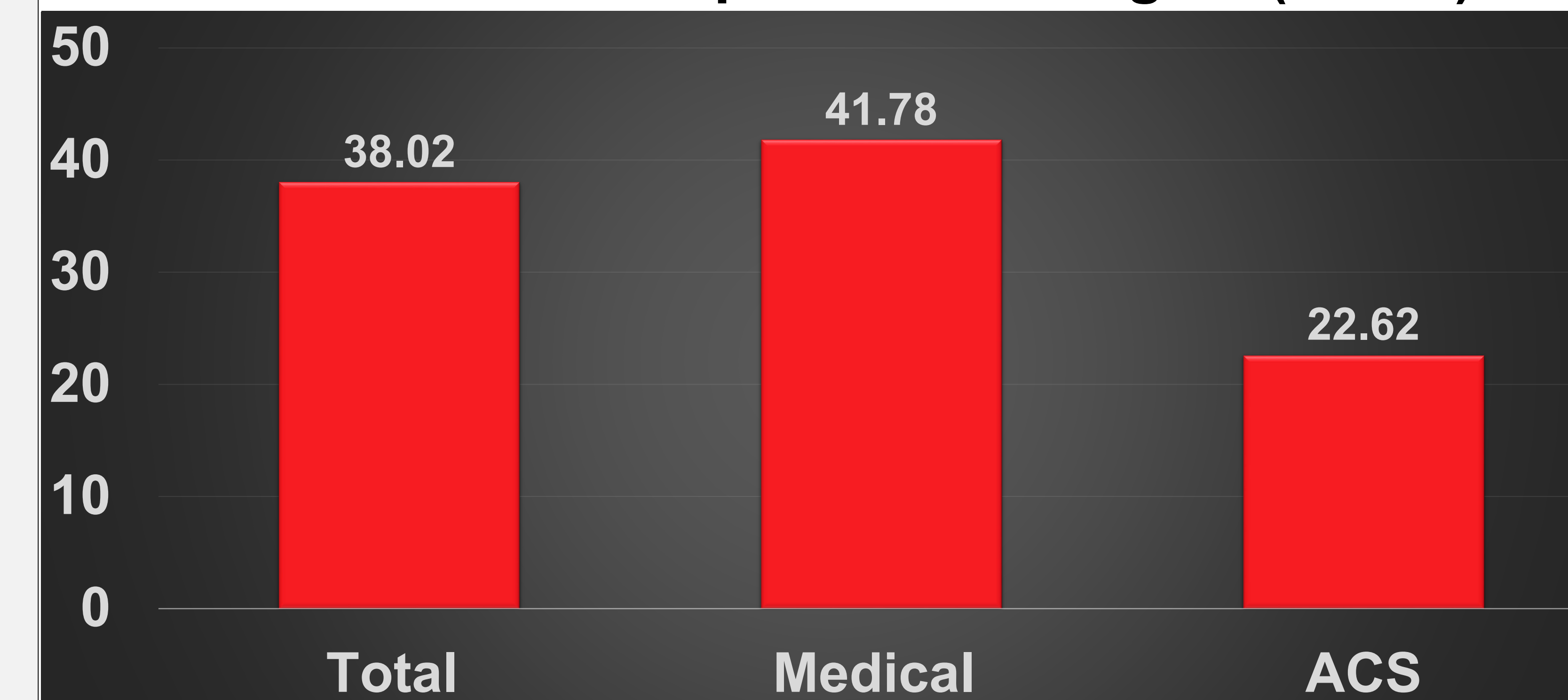


Initial anti-Xa level on heparin infusion: medical vs ACS treatment

	Above Goal	Within Goal	Below Goal
Medical (n=22)	17 (77%)	4 (18%)	1 (5%)
ACS (n=5)	3 (60%)	1 (20%)	1 (20%)

Results

Mean time to therapeutic anti-Xa goal (hours)



Average baseline anti-Xa level before heparin infusion

	Anti-Xa (IU/mL)
Total (n=22)	0.72
Medical (n=18)	0.78
ACS (n=4)	0.69

Conclusion

The results of this retrospective chart review indicate that patients on a DOAC who later require a heparin infusion in the hospital may have initial anti-factor Xa levels that are supratherapeutic. More research needs conducted to determine the safety impact on patients.

References

- Macedo KA, Tatarian P, Eugenio KR. Influence of Direct Oral Anticoagulants on Anti-Factor Xa Measurements Utilized for Monitoring Heparin. *Annals of Pharmacotherapy*. 2017 Sep;52(2):154–9.
- Cini M, Legnani C, Testa S, Tripodi A, Cosmi B, Palareti G. An in vitro study to investigate the interference of enoxaparin on plasma levels of direct oral factor Xa inhibitors measured by chromogenic assays. *International Journal of Laboratory Hematology*. 2019 Jan 30;41(3):309–15.

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