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Inappropriate prescribing of direct oral anticoagulants at a large academic medical center

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Background

- Treatment with anticoagulants has changed significantly since the approval of the direct-acting oral anticoagulants (DOACs).
- Drug-related problems associated with the prescribing of DOACs occur frequently in hospitalized patients.[1]
- Warfarin requires close monitoring with blood tests, but DOACs do not.
- However, DOACs have complex dosing regimens based on patient-specific traits, making it difficult to appropriately prescribe these medications.[2]

Objectives

- Change in the amount of inappropriate prescribing of DOACs before and after implementation of a clinical decision support tool.

Methods

- Retrospective, observational study of patients prescribed apixaban, rivaroxaban, or dabigatran while staying in an inpatient unit at the University of Maryland Medical Center between November 1-28, 2016 (pre-phase) and February 1-28, 2017 (post-phase).
- Patients were included if they were prescribed apixaban, rivaroxaban, or dabigatran during a hospitalization between November 1-28, 2016 and February 1-28, 2017. No patients were excluded.
- The study was deemed exempt by the institutional review board.

Results

Table 1: Demographics

Variable	Pre-phase (n=103)	Post-Phase (n=113)
Age (years)	60.1 (18.2)	61.3 (17.9)
Male	48%	67%
Weight (kg)	95.0 (29.6)	89.5 (28.7)
Serum creatinine (mg/dL)	1.4 (1.6)	1.1 (1.0)
Creatinine clearance (mL/min)	83.9 (33.2)	83.6 (31.7)
Indication		
Nonvalvular AF	48%	55%
VTE treatment	19%	31%
Recurrent VTE prophylaxis	29%	19%
Orthopedic surgery	0%	1%
Other	7%	7%
Drug		
Apixaban	36%	43%
Dabigatran	14%	24%
Rivaroxaban	53%	46%
DOAC was home med	68%	73%
Drug-drug interaction present	10%	10%

Data presented as mean +/- standard deviation or numbers/ percentages.

Table 2: Comparison by Appropriateness

Variable	Appropriate (n=194)	Inappropriate (n=20)	P-Value
Age	59.8 (17.6)	68.1 (18.4)	0.048
Male	107 (55.2%)	8 (40.0%)	0.196
Weight (kg)	93.4 (29.2)	86.6 (26.8)	0.312
Serum creatinine (mg/dL)	1.2 (1.4)	1.3 (1.1)	0.764
Creatinine clearance (mL/min)	85.8 (31.4)	70.1 (34.0)	0.036
Drug (number)			
Apixaban	70	9	0.732
Dabigatran	35	3	
Rivaroxaban	89	8	
DOAC was home med (number)	122 (62.9%)	18 (90%)	0.015
Drug-drug interaction present	17	3	0.410

AF atrial fibrillation; VTE venous thromboembolism; DOAC direct-acting oral anticoagulant

Results

- Inappropriate prescribing
  - 9.7% pre-phase and 8.8% post-phase (p-value: 0.826)
  - Patients who received inappropriate therapy during hospitalization were more likely to be older, have lower creatinine clearance, and more likely to be on the medication at home.
- Reasons for inappropriate prescribing
  - 75% incorrect dose
  - 5% unapproved indication
  - 20% other
- Reasons for incorrect dose
  - 86.7% dose too low
  - 6.7% creatinine clearance too low
  - 6.7% age and weight cutoffs for apixaban

Conclusions

- Implementing a clinical decision support tool did not impact the number of inappropriate DOAC orders likely due to the low number of inappropriate orders at baseline.
- Results suggest that many prescribers started patients' home medication rather than adjusting for changes that need to be made on admission.
- Limitations of this study: small sample size, single-center

Disclosures

Authors of this presentation have nothing to disclose.

References

1. Viprey M, Jeanin R, Piriou V, et al. Prevalence of drug-related problems associated with direct oral anticoagulants in hospitalized patients: a multicenter, cross-sectional study. *J Clin Pharm Ther*. 2016.
2. Lee LH. DOACs- advances and limitations in real world. *Thrombosis Journal*. 2016; 14(Suppl 1): 133-40.