Rates of off-label dosing of apixaban in end stage renal disease: a retrospective analysis of a large health-system

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Background

- Apixaban is approved for stroke prophylaxis in patients with non-valvular atrial fibrillation (AF) and for the treatment of venous thromboembolism (VTE).[1]
- Apixaban is the only direct oral anticoagulant (DOAC) approved for use in patients with end stage renal disease (ESRD). Dosage adjustment criteria are the same for patients with and without ESRD.
- Approximately 15% of patients receiving a DOAC are given an off-label dose.[2,3] Off-label doses are associated with worse clinical outcomes. It is unknown whether the rate of off-label dosing among patients with ESRD is similar to those without ESRD.

Objectives

Primary

- Composite rate of incorrect doses of apixaban administered in patients with ESRD on IHD

Secondary

- Rates of off-label apixaban dosing, including rates of:
- Underdosing and overdosing
- Incorrect doses based on indication and incorrect doses by each hopsital within the health system

Inclusion/Exclusion Criteria

Inclusion Criteria:

- Age ≥ 18 years of age
- ESRD requiring IHD
- Received at least one inpatient dose of apixaban while admitted to a hospital within the health-system that used Epic as their electronic health record between 11/2015 and 8/2017
- Had an Indication for therapeutic anticoagulation

Exclusions Criteria:

- Peritoneal dialysis

Methods

- A list of patients receiving apixaban who met inclusion criteria were screened
- Data was collected using retrospective chart review of electronic health records
- Inappropriate or off-label dosing was defined as any dose that deviated from package recommend dosing

Results

- Seventy five charts were reviewed; Fifty-one patients (68%) met the criteria and were included in the study
- Demographic information is provided in Table 1.
- All patients who were incorrectly dosed recieved a dose lower than the FDA recommended dose
- Forty-four patients were discharged on apixaban including 19 patients with AF, 20 patients with VTE, and 5 patients with an off-label indication
- Three patients who received an appropriate dose change were on anticoagulation for AF
- One patient who received an inappropriate dose change was on anticoagulation for VTE

Table 1. Demographics

Characteristics	Total Patients = 51
Mean age, years	59.5
Female gender – n (%)	34 (66.7%)
AF – n (%)	20 (39.3)
VTE – n (%)	24 (47%)
Off-label indication – n (%)	7 (13.7%)

Table 2: Results

Endpoint	N (%)
Correctly dosed	33 (65%)
Incorrectly dosed	18 (35%)
AF patients incorrectly dosed	5 (25%)
VTE patients incorrectly dosed	11 (45%)
Hospital A patients incorrectly dosed	8 (36%)
Hospital B patients incorrectly dosed	6 (38%)
Hospital C patients incorrectly dosed	3 (43%)
Hospital D patient incorrectly dosed	1 (16%)

Table 3. Dose Changes During Hospitalization

Endpoint	N
Total dose changes	4
Appropriate dose changes	3
Inappropriate dose change	1

Table 3. Dosing at discharge

Endpoints	N (%)
Total patients incorrectly dosed	15 (34%)
AF patients incorrectly dosed	2 (15%)
VTE patients incorrectly dosed	11 (42%)
Dose changes during hospitalization	4

Conclusions

- The results of our study indicate that incorrect dosing of apixaban in patients with ESRD on IHD appears to be more common than population estimates of patients without ESRD
- All patients who received an off-label dose lower than the FDA recommended dose, and the majority of incorrectly dosed patients were receiving apixaban for the treatment of VTE
- There appears to be a disconnect between the FDA recommended dose of apixaban in patients with ESRD and what is seen in practice
- Rates of incorrect apixaban dosing are high; thus, pharmacists may be able to play a role in improving appropriate prescribing practices by educating providers and patients
- Limitations of this study include the retrospective nature and small sample size

Reference

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