Group-Based Trajectory Modeling to Evaluate Adherence Patterns for Direct Oral Anticoagulant Among Patients with Atrial Fibrillation

Bilqees Fatima[1], Anjana Mohan[1], Hua Chen[1], Ashish A. Deshmukh[2], Matthew A. Wanat[3], Ekere James Essien[1], Rutugandha Paranjpe[1], Susan Abughosh[1]

[1]Department of Pharmaceutical Health Outcomes and Policy, College of Pharmacy, University of Houston, Houston, TX, [2]Department of Public Health Sciences, Medical university of South Carolina, South Carolina, USA

[3] Department of Pharmacy Practice and Translational Research, University of Houston, Texas, USA

Contact Information:
Bilqees Fatima
University of Houston
Email:
Bfatima5@central.uh.edu

Poster Code: RWD3

BACKGROUND

- The US Food and Drug Administration (FDA) approved Direct Oral Anticoagulants (DOACs) due to a more favorable safety and efficacy profile compared to traditional oral anticoagulants.
- DOAC are the standard of care to prevent stroke and systemic embolism among patients with atrial fibrillation (AF).
- Suboptimal adherence with anticoagulants such as DOACs is a major problem, increasing risk of thromboembolic events.
- Group-based trajectory modeling (GBTM) is a robust method to identify underlying variations in the longitudinal adherence patterns and providing a qualitative dimension compared to single estimates of proportion of days covered (PDC).

OBJECTIVE

- To evaluate distinct trajectories of DOAC adherence using GBTM and identify predictors associated with adherence trajectories.

METHODS

Study Design: Retrospective cohort study (Figure 1)

Data Source: Administrative claims (Texas Medicare Advantage Plan)

Inclusion Criteria:

- ☑ AF patients ≥18 years old
- ☑ DOAC prescription (July 2016-Dec 2017)
- ☑ Continuous enrollment

Exclusion Criteria:

- ☒ Diagnosis of systemic embolism, valvular disease and valvular replacement condition
- ☒ Concomitant warfarin users

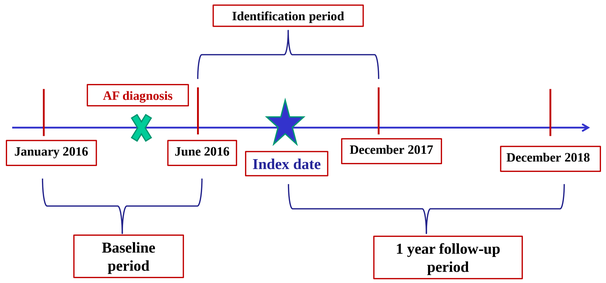
Adherence Measurement:

- For 12 monthly follow-up periods following the clinical event, the monthly DOAC proportion of days covered (PDC) was measured and a PDC ≥ 0.80 was considered adherent
- 12 binary indicators of DOACs adherence modelled into a logistic Group-based trajectory model (GBTM)

Statistical Analysis:

- Descriptive statistics: Chi-square and ANOVA
- Multinomial logistic regression model:
  - Outcome: Trajectory groups with "adherent" trajectory as reference
- SAS version 9.4 (SAS Institute, Cary, NC)

Figure 1. Study Design



RESULTS

Figure 2. Cohort Information

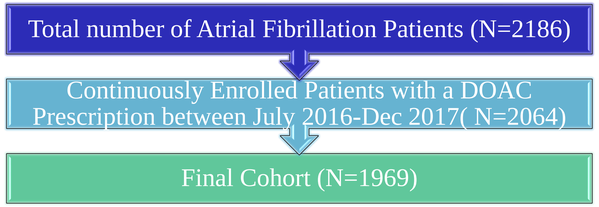
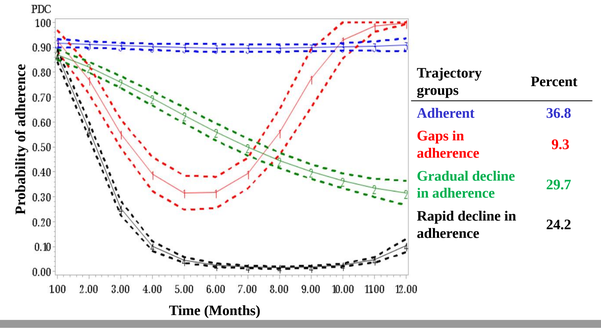


Figure 3. Adherence Trajectories for all Patients



RESULTS

Table 1. Patient Demographics and Clinical Characteristics

Variables	Total Patients (N=1969)	Gaps in adherence (N=163)	Gradual Decline (N=567)	Adherent (N=757)	Rapid Decline (N=482)	P value
Age						
<75 years	799 (40.58)	58 (35.58)	233 (41.09)	306 (40.42)	202 (41.91)	
≥75 years	1170 (59.42)	105 (64.42)	334 (58.91)	451 (59.58)	280 (58.09)	0.54
Gender						
Female	1075 (54.60)	94 (57.67)	329 (58.02)	426 (56.27)	226 (46.89)	
Male	894 (45.40)	69 (42.33)	238 (41.98)	331 (43.73)	256 (53.11)	**0.001***
Health plan						
No subsidy	1245 (63.23)	128 (78.53)	377 (66.49)	390 (51.52)	350 (72.61)	
Low-income subsidy	724 (36.77)	35 (21.47)	190 (33.51)	367 (48.48)	132 (27.39)	**0.0001***
Prevalent users						
No	933 (47.38)	53 (32.52)	259 (45.68)	314 (41.48)	307 (63.69)	
Yes	1036 (52.62)	110 (67.48)	308 (54.32)	443 (58.52)	175 (36.31)	**0.0001***
CHA2DS2-VASc score						
Score < 3	899 (45.66)	77 (47.24)	264 (46.56)	336 (44.39)	22 (46.06)	
Score ≥3	1070 (54.34)	86 (52.76)	303 (53.44)	421 (55.61)	260 (53.94)	0.83
HAS-BLED score						
Score < 2	1247 (63.33)	113 (69.33)	374 (65.96)	495 (65.39)	265 (54.98)	
Score ≥2	722 (36.67)	50 (30.67)	193 (34.04)	262 (34.61)	317 (45.02)	**0.0002***
PCP visits						
No	1501 (76.23)	119 (73.01)	452 (79.72)	563 (74.37)	367 (76.14)	
Yes	468 (23.77)	44 (26.99)	115 (20.28)	194 (25.63)	115 (23.86)	0.10
Comorbidities						
Diabetes Mellitus						
No	1749 (88.83)	146 (89.57)	503 (88.71)	671 (88.64)	429 (89.0)	
Yes	220 (11.17)	17 (10.43)	64 (11.29)	86 (11.36)	53 (11.0)	0.98
Hypertension						
No	1587 (80.60)	128 (78.53)	477 (84.13)	616 (81.37)	366 (75.93)	
Yes	382 (19.40)	35 (21.47)	90 (15.87)	141 (18.63)	116 (24.07)	**0.007***
Coronary Artery Disease						
No	1731 (87.91)	143 (87.73)	500 (88.18)	676 (89.30)	412 (85.48)	
Yes	238 (12.09)	20 (12.27)	67 (11.82)	81 (10.70)	70 (14.52)	0.25
Renal disease						
No	1845 (93.70)	157 (96.32)	526 (92.77)	721 (95.24)	441 (91.49)	
Yes	124 (6.30)	6 (3.68)	41 (7.23)	36 (4.76)	41 (8.51)	**0.02***
Anemia						
No	1828 (92.84)	156 (95.71)	527 (92.95)	707 (93.39)	438 (90.87)	
Yes	44 (9.13)	7 (4.29)	40 (7.05)	50 (6.61)	44 (9.13)	0.15
Comedications						
Antiplatelet agents						
No	1798 (91.32)	150 (92.02)	529 (93.30)	685 (90.49)	434 (90.04)	
Yes	171 (8.68)	13 (7.98)	38 (6.70)	72 (9.51)	48 (9.96)	0.20
Antiarrhythmic agents						
No	1491 (75.72)	120 (73.62)	424 (74.78)	574 (75.83)	373 (77.39)	
Yes	478 (24.28)	43 (26.38)	143 (25.22)	183 (24.17)	109 (22.61)	0.70
Antihyperlipidemic agents						
No	690 (35.04)	70 (42.94)	208 (36.68)	240 (31.70)	172 (35.68)	
Yes	1279 (64.96)	93 (57.06)	359 (63.32)	517 (68.30)	310 (64.32)	**0.03***
NSAID						
No	1817 (92.28)	156 (95.71)	517(91.18)	706 (93.26)	438 (90.87)	
Yes	152 (7.72)	7 (4.29)	50 (8.82)	51 (6.74)	44 (9.13)	0.11
CMS Risk score	2.05 (1.20)	1.96 (1.33)	1.95 (1.09)	2.16 (1.26)	2.03 (1.19)	**0.009***

* Statistically significant difference

Table 2. Multinomial Logistic Regression Model (N=1969)

Variables	Reference	Gaps in adherence vs Adherent	Gradual decline vs Adherent	Rapid decline vs Adherent
		OR (95% CI)	OR (95% CI)	OR (95% CI)
Age				
≥75 years	<75 years	**1.71 (1.06-2.74)***	1.07 (0.80-1.44)	0.88 (0.65-1.19)
Gender				
Male	Female	0.70 (0.44-1.10)	0.86 (0.66-1.13)	**1.36 (1.03-1.80)***
Health plan				
Low-income subsidy	No subsidy	**3.48 (2.29-5.27)***	**1.77 (1.40-2.24)***	**2.32 (1.79-3.00)***
Prevalent Users				
Yes	No	**1.60 (1.08-2.36)***	0.80 (0.63-1.01)	**0.42 (0.32-0.54)***
CHA2DS2-VASc score				
Score ≥ 3	Score < 3	**0.51 (0.28-0.93)***	0.88 (0.62-1.25)	0.98 (0.68-1.42)
PCP visits				
Yes	No	1.31 (0.88-1.97)	**0.75 (0.57-0.99)***	0.86 (0.65-1.14)
Hypertension				
Yes	No	**2.09 (1.05-4.16)***	0.83 (0.56-1.25)	0.94 (0.63-1.41)
Renal disease				
Yes	No	1.00 (0.38-2.64)	**1.73 (1.03-2.91)***	1.34 (0.80-2.26)
Antihyperlipidemic agents				
Yes	No	**0.64 (0.45-0.91)***	0.64 (0.45-0.91)	0.80 (0.62-1.03)
NSAID Use				
Yes	No	0.97 (0.39-2.39)	**1.61 (1.01-2.60)***	1.23 (0.75-2.02)

P-value < 0.05

Note: Only statistically significant variables are presented in this table

CONCLUSION

- Only 36.8% of the patients were consistently adherent throughout the entire follow-up (adherent trajectory).
- Future studies should evaluate the difference in adherence among once daily rivaroxaban and twice daily apixaban.
- The trajectories and predictors identified in this study can aid clinicians in identifying patients likely to become nonadherent and develop tailored interventions to improve their adherence.

IRB APPROVAL

The study protocol approval was obtained from the University of Houston research institutional review board on 2/16/2021 (IRB ID: STUDY00002815).