Balancing Efficacy and Safety: Apixaban vs. Rivaroxaban in Multiple Myeloma-Associated Thrombosis and Clinical Outcomes

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Introduction

- Multiple myeloma (MM) is associated with a high risk of venous thromboembolism (VTE) and stroke, due to disease- and treatment-related factors.
- Direct oral anticoagulants (DOACs) such as apixaban and rivaroxaban offer potential for thromboprophylaxis, but their comparative effectiveness in MM remains unclear.
- This study aims to compare the Clinical outcomes of apixaban and rivaroxaban in a large global cohort of MM patients.

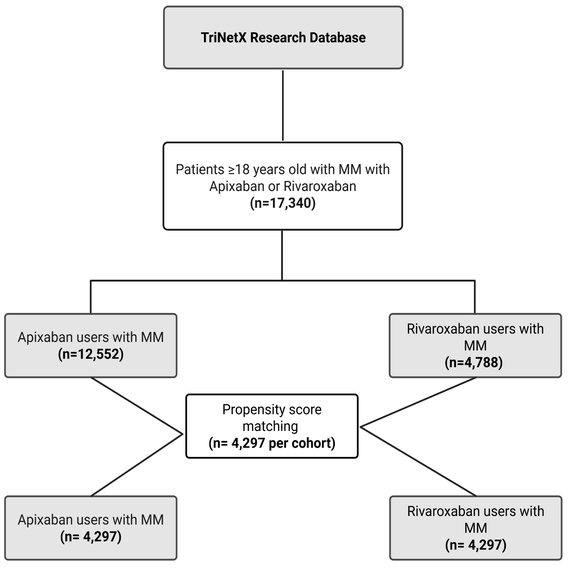
Methods and Materials

- We performed a retrospective propensity score-matched (PSM) cohort study using the TriNetX Analytics Network database, including MM patients treated with apixaban (n=12,552) and rivaroxaban (n=4788) from 2010 to 2022.
- PSM (1:1) was applied using a greedy nearest-neighbor method with a caliper of 0.1 pooled standard deviations, adjusting for demographics, MM-directed therapy, comorbidities, laboratory values, and cardiovascular medications.
- Outcomes Included ischemic stroke/transient ischemic attacks (TIA), VTE, major bleeding, anemia, hospitalizations, intensive care unit (ICU) admissions, and acute kidney injury (AKI).
- Odds ratios (ORs) with 95% CIs were calculated over a 5-year follow-up.

Results

- After PSM, 4,297 matched pairs (mean age 74.1±10.8 years for apixaban users and 74.1±10.9 years for rivaroxaban, 41% females in both groups) were analyzed

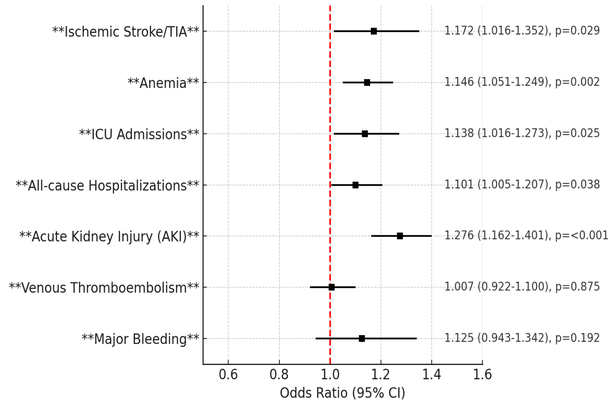
CONSORT DIAGRAM



Patient Characteristics

Characteristic	Apixaban users n=4297	Rivoraxaban Users n=4297	Std Diff.
Demographics			
Age (years), mean ± SD	74.1 ± 10.8	74.1 ± 10.9	0.001
Age at Index (years),	68.5 ± 10.9	68.6 ± 11.0	0.004
White	3,006 (70.0)	3,019 (70.3)	0.007
African American	666 (15.5)	668 (15.5)	0.001
Asian	67 (1.6)	69 (1.6)	0.004
Hispanic/Latino	153 (3.6)	157 (3.7)	0.005
AIAN	15 (0.3)	12 (0.3)	0.012
Pacific Islander	10 (0.2)	12 (0.3)	0.009
Unknown Race	447 (10.4)	433 (10.1)	0.011
Female	1,793 (41.7)	1,766 (41.1)	0.013
Male	2,413 (56.2)	2,441 (56.8)	0.013
Diagnosis			
Hypertension	2,318 (53.9)	2,325 (54.1)	0.003
Cardiomyopathy	353 (8.2)	338 (7.9)	0.013
Dyslipidemia	1,700 (39.6)	1,686 (39.2)	0.007
Ischemic Heart Disease	1,015 (23.6)	998 (23.2)	0.009
Obesity	822 (19.1)	816 (19.0)	0.004
Heart Failure	835 (19.4)	825 (19.2)	0.006
CKD Stage 3	563 (13.1)	538 (12.5)	0.017
COPD	412 (9.6)	419 (9.8)	0.006
Stroke	237 (5.5)	235 (5.5)	0.002
Hepatic Fibrosis	30 (0.7)	25 (0.6)	0.015
PAD	236 (5.5)	228 (5.3)	0.008
ESRD	75 (1.7)	61 (1.4)	0.026
Atrial Fibrillation	1,173 (27.3)	1,159 (27.0)	0.007
Nicotine Dependence	386 (9.0)	386 (9.0)	<0.001
Alcohol Disorders	102 (2.4)	94 (2.2)	0.012
Diabetes Mellitus	940 (21.9)	941 (21.9)	0.001
Unspecified Afib	951 (22.1)	975 (22.7)	0.013
Stem Cell Transplant	906 (21.1)	901 (21.0)	0.003
Medications			
Antilipemic Agents	1,756 (40.9)	1,733 (40.3)	0.011
Insulin	827 (19.2)	863 (20.1)	0.021
Aspirin	1,758 (40.9)	1,783 (41.5)	0.012
Bortezomib	801 (18.6)	795 (18.5)	0.004
Daratumumab	282 (6.6)	306 (7.1)	0.022
Carfilzomib	202 (4.7)	216 (5.0)	0.015
Rituximab	101 (2.4)	96 (2.2)	0.008
Venetoclax	43 (1.0)	41 (1.0)	0.005
Ixazomib	100 (2.3)	103 (2.4)	0.005
Elotuzumab	28 (0.7)	34 (0.8)	0.016
Selinexor	10 (0.2)	10 (0.2)	<0.001
Isatuximab	10 (0.2)	12 (0.3)	0.009
Teclistamab	10 (0.2)	10 (0.2)	<0.001
Cyclophosphamide	490 (11.4)	485 (11.3)	0.004
Belantamab Mafodotin	10 (0.2)	10 (0.2)	<0.001
Doxorubicin	98 (2.3)	102 (2.4)	0.006
Idecabtagene Vicleucel	10 (0.2)	10 (0.2)	<0.001
Ciltacabtagene Autoleucel	10 (0.2)	10 (0.2)	<0.001
Dexamethasone	2,375 (55.3)	2,425 (56.4)	0.023
Laboratory			
LDL Cholesterol (mg/dL), mean ± SD	87.5 ± 39.5	87.7 ± 37.6	0.006
Hemoglobin A1c	6.2 ± 1.5	6.2 ± 1.6	0.003

Forest Plot



Outcomes

Outcomes	Odds Ratio (95% CI)	P-value
Ischemic Stroke/TIA	1.172 (1.016 – 1.352)	0.029
Anemia	1.146 (1.051 – 1.249)	0.002
ICU Admissions	1.138 (1.016 – 1.273)	0.025
Hospitalizations	1.101 (1.005 – 1.207)	0.038
AKI	1.276 (1.162 – 1.401)	<0.001
VTE	1.007 (0.922 – 1.100)	0.875
Major Bleeding	1.125 (0.943 – 1.342)	0.192

Conclusion

- In this large, PSM cohort study of MM patients, apixaban therapy was associated with higher odds of ischemic stroke/TIA, anemia, ICU admissions, all-cause hospitalizations, and AKI compared with rivaroxaban therapy.
- However, the risks of VTE and major bleeding were comparable between the two anticoagulants. These findings highlight the need for individualized thromboprophylaxis in MM patients, considering both efficacy and safety profiles requiring further prospective trails

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