

Delayed Administration of Apixaban Reduces the Risk of Transfusions Without Increasing Thromboembolic Risk following Revision Total Hip Arthroplasty

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INTRODUCTION: The optimal timing for initiating direct oral anticoagulants for venous thromboembolism prophylaxis following revision total hip arthroplasty (rTHA) remains a debated topic. This study compared the incidence of thromboembolic and bleeding complications between patients beginning prophylactic courses of apixaban or rivaroxaban on postoperative day (POD) 0 versus 1.

METHODS: A national healthcare database including approximately 25% of all surgeries performed in the United States was used to identify patients who underwent aseptic both-component rTHA between 2016-2023. Patients receiving apixaban or rivaroxaban for chemoprophylaxis on POD0 were compared to patients who received the same anticoagulant on POD1. Primary outcomes included 90-day rates of postoperative bleeding complications (acute anemia, hematoma, hemorrhage, and transfusion) and thromboembolic complications (deep vein thrombosis [DVT], pulmonary embolism [PE], stroke and myocardial infarction [MI]). Multivariable regression analysis was used to assess differences between cohorts.

RESULTS: In total, 6,292 patients were identified. Of the 3,395 (54.0%) patients administered apixaban, 664 (19.6%) received anticoagulation beginning POD0 compared to 2,731 (80.4%) on POD1. Of the 2,897 (46.0%) patients given rivaroxaban, 595 (20.5%) received anticoagulation on POD0 compared to 2,302 (79.5%) on POD1. Patients receiving apixaban on POD1 had a reduced risk of transfusion (adjusted odds ratio [aOR] 0.58, 95%-confidence interval (CI):0.34-0.98, P=0.043) but comparable risk of anemia, hemorrhage and hematomas relative to POD0 patients. Additionally, patients receiving apixaban on POD1 had an equivalent risk of DVT and PE, but a reduced risk of MI (aOR 0.28, 95%-CI:0.11-0.76, P=0.012). Rivaroxaban demonstrated no significant differences in bleeding or thromboembolic complications between POD0 and POD1.

DISCUSSION AND CONCLUSION:

Delayed administration of apixaban until POD1 was associated with a reduced risk of transfusion without an increased risk of thromboembolic complications in patients undergoing rTHA. The timing of rivaroxaban administration did not affect postoperative bleeding or thromboembolic complications but may be limited due to sample size.

Table 1: Bleeding Complications

90-Day Postoperative Outcomes	Apixaban Day 0 (N=664)		Apixaban Day 1 (N=2,731)		Univariate Regression		Multivariable Regression		
	N	%	N	%	OR	95%-CI [P-Value]	aOR	95%-CI [P-Value]	
Aggregate Bleeding Complications	53	8.0%	157	5.7%	0.70	0.4722	0.63	0.37-1.0682	0.316
Transfusion	24	3.6%	53	1.9%	0.51	0.2415	0.46	0.26-0.8262	0.485
Acute Anemia	40	6.0%	120	4.0%	0.70	0.4080	0.61	0.35-1.175	0.206
Hematoma	8	1.2%	29	1.1%	0.88	0.3936	0.71	0.40-1.2683	0.785
Hemorrhage	1	0.2%	4	0.3%	1.95	0.1465	0.53	0.24-1.2465	0.485

Table 2: Thromboembolic Complications

90-Day Postoperative Outcomes	Apixaban Day 0 (N=664)		Apixaban Day 1 (N=2,731)		Univariate Regression		Multivariable Regression		
	N	%	N	%	OR	95%-CI [P-Value]	aOR	95%-CI [P-Value]	
Deep Vein Thrombosis	3	0.4%	11	0.4%	0.18	0.1349	0.245	0.10-0.5231	0.231
Pulmonary Embolism	1	0.2%	4	0.2%	1.40	0.2210	0.706	0.16-3.1233	0.93
Stroke	1	0.2%	3	0.1%	0.73	0.2823	0.783	N/A	N/A
Myocardial Infarction	7	1.1%	8	0.3%	0.28	0.1530	0.63	0.28-1.4730	0.612

Table 3: Bleeding Complications

90-Day Postoperative Outcomes	Rivaroxaban Day 0 (N=595)		Rivaroxaban Day 1 (N=2,302)		Univariate Regression		Multivariable Regression		
	N	%	N	%	OR	95%-CI [P-Value]	aOR	95%-CI [P-Value]	
Aggregate Bleeding Complications	37	6.2%	159	6.9%	1.05	0.5336	0.792	0.463-1.3623	0.925
Transfusion	11	2.2%	44	1.9%	0.87	0.4311	0.668	0.37-1.1655	0.44
Acute Anemia	26	4.4%	112	4.9%	1.32	0.7152	0.613	0.36-1.0889	0.729
Hematoma	7	1.2%	26	1.1%	0.96	0.2222	0.923	0.39-2.2063	0.626
Hemorrhage	6	1.0%	17	0.7%	0.73	0.3813	0.518	0.21-1.2173	0.591

Table 4: Thromboembolic Complications

90-Day Postoperative Outcomes	Rivaroxaban Day 0 (N=595)		Rivaroxaban Day 1 (N=2,302)		Univariate Regression		Multivariable Regression		
	N	%	N	%	OR	95%-CI [P-Value]	aOR	95%-CI [P-Value]	
Deep Vein Thrombosis	7	1.2%	29	1.3%	0.92	0.2143	0.851	0.40-2.2363	0.917
Pulmonary Embolism	3	0.5%	10	0.4%	0.96	0.3139	0.821	0.31-2.3703	0.788
Stroke	0	0.0%	2	0.1%	N/A	N/A	N/A	N/A	N/A
Myocardial Infarction	0	0.0%	2	0.1%	N/A	N/A	N/A	N/A	N/A