An Evaluation of Aspirin for Thromboembolic Chemoprophylaxis in Aseptic Revision Total Knee Arthroplasty

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INTRODUCTION: Aspirin is the predominant thromboembolic chemoprophylaxis agent used in primary total knee arthroplasty; however, its safety and efficacy in revision total knee arthroplasty (rTKA) are poorly characterized. The purpose of this study was to assess the thromboembolic and bleeding complications among patients receiving either aspirin or enoxaparin following both-component aseptic rTKA.

METHODS: An administrative database including approximately 25% of all surgeries performed in the United States was retrospectively queried to identify all both-component aseptic rTKAs from 2016-2023 receiving either aspirin or enoxaparin for thromboembolic chemoprophylaxis. Patient demographics, comorbidities, and 90-day postoperative rates of deep vein thrombosis (DVT), pulmonary embolism (PE), stroke, myocardial infarction (MI), and bleeding complications were recorded for each chemoprophylactic group. A multivariable logistic regression model accounting for demographic and comorbidity differences between cohorts was used to assess for differences in risk of postoperative adverse events.

RESULTS: In total, 26,471 aseptic rTKA patients (aspirin: 18,009 [68.0%], enoxaparin: 8,462 [32.0%]) were identified. While there were no statistically significant differences in the distributions of patient race between the two groups (*P*=0.357), there were significant differences in age (aspirin: 66.40 ± 9.93 years, enoxaparin: 67.39 ± 10.52 years), gender (aspirin: male - 6,882 [37.9%], female - 11,180 [62.1%], unknown gender - 3 [0.0%]; enoxaparin: male - 2,830 [33.4%], female - 5,632 [66.6%]), marital status, and hospital characteristics (all *P*<0.001). Upon multivariable analysis, no statistically significant differences were observed in DVT, PE, stroke, and MI risk between the aspirin and enoxaparin groups. However, the aspirin cohort demonstrated a significantly lower risk of transfusion (0.7% vs. 1.1%, adjusted odds ratio [aOR] = 0.69, 95% Confidence Interval [CI] = 0.52-0.92, *P*=0.012), acute anemia (2.1% vs. 3.1%, aOR = 0.81, 95% CI = 0.69-0.96, *P*=0.017), and aggregate bleeding complications (3.0% vs. 4.3%, aOR = 0.81, 95% CI = 0.70-0.93, *P*=0.004).

DISCUSSION: Thromboembolic prophylaxis with aspirin following aseptic rTKA resulted in a comparable thromboembolic risk compared to enoxaparin, while exhibiting a decreased risk of perioperative bleeding complications. Surgeons may consider using aspirin as a thromboembolic chemoprophylaxis agent for aseptic rTKA patients.

SIGNIFICANCE/CLINICAL RELEVANCE: Given the paucity of data on aspirin as a thromboembolic prophylaxis agent for aseptic rTKA patients, the present study provides valuable insights regarding aspirin's effectiveness in preventing postoperative thromboembolic and bleeding complications in this patient population. While these results indicate that aspirin could be a viable option for thromboembolic prophylaxis in aseptic rTKA, surgeons should be sure to consider patient-specific risk factors and select chemoprophylaxis agents on a case-by-case basis.

Table 1: Thromboembolic Complications										
90-Day Postoperative Outcomes	**Enoxaparin (N=8,462)**		**Aspirin (N=18,009)**		**Univariate Regression**			**Multivariable Regression**		
	N	%	N	%	OR	95% CI	*P*-Value	aOR	95% CI	*P*-Value
Deep Vein Thrombosis	82	1.0%	147	0.8%	0.84	0.64-1.10	0.211	1.03	0.77-1.37	0.865
Pulmonary Embolism	36	0.4%	61	0.3%	0.80	0.53-1.20	0.277	1.05	0.68-1.62	0.83
Stroke	18	0.2%	19	0.1%	0.50	0.26-0.94	**0.033**	0.66	0.34-1.29	0.228
Myocardial Infarction	10	0.1%	24	0.1%	1.13	0.54-2.36	0.749	1.41	0.64-3.12	0.393

Table 2: Bleeding Complications										
90-Day Postoperative Outcomes	**Enoxaparin (N= 8,462)**		**Aspirin (N=18,009)**		**Univariate Regression**			**Multivariable Regression**		
	N	%	N	%	OR	95% CI	*P*-Value	aOR	95% CI	*P*-Value
Aggregate Bleeding Complications	360	4.3%	540	3.0%	0.70	0.61-0.80	< **0.001**	0.81	0.70-0.93	**0.004**
Transfusion	94	1.1%	119	0.7%	0.59	0.45-0.78	< **0.001**	0.69	0.52-0.92	**0.012**
Acute Anemia	265	3.1%	387	2.1%	0.68	0.58-0.80	< **0.001**	0.81	0.69-0.96	**0.017**
Hematoma	51	0.6%	102	0.6%	0.94	0.67-1.32	0.716	0.97	0.69-1.36	0.868
Hemorrhage	38	0.4%	65	0.4%	0.80	0.54-1.20	0.284	0.84	0.55-1.29	0.429