Aspirin is Associated with a Lower Risk of Bleeding Complications than Enoxaparin in Aseptic Revision Total Hip Arthroplasty Patients

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Disclosures: Arjun Aron (N), Matthew A. Lim (N), Sahil S. Telang (N), Pranit Kumaran (N), Ryan C. Palmer(N), Sagar Telang (N), Jay R. Lieberman MD (1-DePuy: A Johnson & Johnson Company. 3B-DePuy: A Johnson & Johnson Company. 4-BD Surgiphor, Hip Innovations Technologies. 7-Saunders/Mosby-Elsevier. 9-AAOS, Hip Society, Musculoskeletal Transplant Foundation, Western Orthopaedic Association), Nathanael D. Heckmann MD (1-Corin U.S.A. 3B-Intellijoint Surgical, MicroPort Orthopedics, Corin U.S.A., Zimmer. 4-Intellijoint Surgical. 9-AAOS, AJRR, AAHKS, Knee Society).

INTRODUCTION: Aspirin is the most frequently prescribed thromboembolic chemoprophylaxis agent in primary total hip arthroplasty. However, its safety and efficacy in revision total hip arthroplasty (rTHA) remain poorly understood. This study aimed to characterize the postoperative risk profile of thromboembolic and bleeding complications following administration of either aspirin or enoxaparin to aseptic rTHA patients.

METHODS: A database containing approximately one-quarter of all surgeries performed in the United States was searched to identify all aseptic both-component aseptic rTHAs from 2016-2023 receiving either aspirin or enoxaparin for thromboembolic chemoprophylaxis. Patient demographics and comorbidities were recorded for each of these two cohorts, in addition to the 90-day postoperative incidence of deep vein thrombosis (DVT), pulmonary embolism (PE), stroke, myocardial infarction (MI), and postoperative bleeding complications. Differences in postoperative complication risks were evaluated using a multivariable logistic regression model controlling for differences in patient characteristics and comorbidities.

RESULTS: In total, 22,524 aseptic rTHA patients (aspirin: 13,463 [59.8%], enoxaparin: 9,061 [40.2%]) were identified. There were no significant differences in patient gender (aspirin: male - 5,433 [40.4%], female - 8,023 [59.6%], unknown gender - 3 [0.0%]; enoxaparin: male - 3,574 [39.5%], female - 5,483 [60.5%]; P=0.142) or hospital rural vs. urban status (P=0.52) between the two chemoprophylaxis groups, although there were significant differences in age (aspirin - 67.84 ± 11.92 years, enoxaparin: 69.85 ± 12.59 years), race distribution, marital status, and all other hospital characteristics included in our analysis (all P<0.001). Following multivariable regression, patients receiving chemoprophylaxis with aspirin were found to have a lower risk of DVT (0.7% vs. 1.1%, adjusted odds ratio [aOR] = 0.73, 95% Confidence Interval [95% CI] = 0.54-0.97, P=0.033), but comparable risk of PE, stroke, and MI compared to patients on enoxaparin. Patients receiving aspirin also had a lower risk of transfusion (2.0% vs. 3.0%, aOR = 0.80, 95% CI = 0.67-0.96, P=0.018), hemorrhage (0.5% vs. 0.8%, aOR = 0.55, 95% CI = 0.39-0.77, P=0.001), and aggregate bleeding complications (5.5% vs. 7.2%, aOR = 0.87, 95% CI = 0.78-0.98, P=0.017).

DISCUSSION: Aspirin chemoprophylaxis was associated with lower postoperative risk of DVT and fewer bleeding complications relative to enoxaparin. Although additional investigations are needed to validate our findings, surgeons may consider thromboembolic prophylaxis with aspirin following aseptic rTHA to mitigate the risk of postoperative bleeding complications.

SIGNIFICANCE/CLINICAL RELEVANCE: While some prior institutional research has characterized the efficacy of aspirin as a thromboembolic prophylaxis agent for aseptic rTHA patients, the present investigation is, to our knowledge, the only study utilizing data from a large nationally representative sample to do so. Our results suggest that aspirin is a viable thromboembolic prophylaxis agent with a favorable bleeding safety profile, although it is essential that surgeons thoroughly evaluate patient-specific risk factors when selecting a chemoprophylaxis regimen.

Table 1: Thromboembolic Complications

90-Day Postoperative Outcomes	Enoxaparin (N=9,061)		Aspirin (N=13,463)		Univariate Regression			Multivariable Regression		
	N	%	N	%	OR	95% CI	*P*-Value	aOR	95% CI	*P*-Value
Deep Vein Thrombosis	103	1.1%	92	0.7%	0.60	0.45-0.79	**< 0.001**	0.73	0.54-0.97	**0.033**
Pulmonary Embolism	46	0.5%	42	0.3%	0.61	0.40-0.93	**0.022**	0.84	0.53-1.32	0.445
Stroke	19	0.2%	24	0.2%	0.85	0.47-1.55	0.597	1.26	0.67-2.37	0.477
Myocardial Infarction	26	0.3%	31	0.2%	0.80	0.48-1.35	0.407	1.04	0.60-1.81	0.890

Table 2: Bleeding Complications

90-Day Postoperative Outcomes	Enoxaparin (N=9,061)		Aspirin (N=13,463)		Univariate Regression			Multivariable Regression		
	N	%	N	%	OR	95% CI	*P*-Value	aOR	95% CI	*P*-Value
Aggregate Bleeding Complications	650	7.2%	737	5.5%	0.75	0.67-0.84	**< 0.001**	0.87	0.78-0.98	**0.017**
Transfusion	268	3.0%	269	2.0%	0.67	0.56-0.79	**< 0.001**	0.80	0.67-0.96	**0.018**
Acute Anemia	480	5.3%	569	4.2%	0.79	0.70-0.89	**< 0.001**	0.92	0.81-1.05	0.221
Hematoma	107	1.2%	125	0.9%	0.78	0.60-1.02	0.066	0.88	0.67-1.14	0.333
Hemorrhage	77	0.8%	61	0.5%	0.53	0.38-0.74	**< 0.001**	0.55	0.39-0.77	**0.001**