

Aspirin Prophylaxis is Not Associated with Increased Risk of Venous Thromboembolism in Arthroplasty for Femoral Neck Fractures: A Non-Inferiority Study

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INTRODUCTION: Venous thromboembolism (VTE) is a known complication of hip arthroplasty for femoral neck fractures (FNF) with various prophylactic anticoagulants utilized to decrease risk. The purpose of this study was to assess the efficacy and perioperative outcomes associated with aspirin for VTE prophylaxis following arthroplasty for FNF.

METHODS: Medical records of 1,220 patients who underwent hip hemiarthroplasty (HHA) or total hip arthroplasty (THA) at an urban academic center from 2011 to 2022 were retrospectively reviewed. Patient characteristics and perioperative outcomes, including length of stay (LOS), VTE, 90-day hospital encounters, and discharge disposition, were collected. Outcomes for patients prescribed aspirin (n=214) were compared to non-aspirin VTE prophylaxis (n=1,006).

RESULTS: Aspirin was more commonly utilized among patients who underwent THA (36.0 vs. 26.7%; p=0.008). There were no significant differences in the incidence of VTE (0.5 vs. 0.7%, p=1.000) and 90-day readmissions (10.4 vs. 12.6%, p=0.514) between patients prescribed aspirin and non-aspirin VTE prophylaxis, respectively. Patients prescribed non-aspirin agents had higher rates of non-home discharge (69.4 vs. 57.8%; p=0.005) and longer LOS (150.6 vs. 127.1 hours; p=0.005). Both cohorts had comparable rates of wound complications (0.5 vs. 0.2%; p=1.00) and periprosthetic joint infections (0.5 vs. 0.9%; p=0.874). Subanalysis of patients based on comorbidity scores demonstrated no difference in VTE incidence for low (0.0 vs. 1.6%, p=1.000) and high scores (0.0 vs. 0.0%, p=1.000), respectively.

DISCUSSION AND CONCLUSION:

Aspirin is not associated with increased incidence of VTE after HHA or THA for FNF. Aspirin prophylaxis should be considered in hip fracture patients to mitigate bleeding risk, particularly those with low to intermediate VTE risk.

	Overall	Aspirin	Non-aspirin	P-value
N	1220	214	1006	
Age: (mean years (range))	79.9 (56-104)	78.9 (49-100)	78.7 (49-100)	0.113
Sex: Men (%)	381 (31.2)	63 (29.4)	318 (31.6)	0.386
Smoking Status: N (%)				<0.001
Current Smoker	34 (4.4)	14 (6.5)	40 (4.0)	
Former Smoker	137 (12.0)	51 (23.8)	206 (20.4)	
Never Smoker	664 (54.4)	145 (67.8)	519 (51.6)	
Unknown	185 (15.2)	4 (1.9)	181 (18.0)	
Race: N (%)				<0.001
African American	42 (3.4)	5 (2.3)	37 (3.7)	
Asian	24 (4.6)	2 (0.9)	22 (2.2)	
Other Race	24 (4.6)	18 (8.4)	56 (5.6)	
Unknown	122 (10.0)	1 (0.5)	121 (12.0)	
White	909 (74.4)	168 (78.5)	740 (73.8)	
BMI (mean kg/m ² (range))	24.1 (17.1-55.3)	24.0 (14.4-60.3)	24.2 (17.1-55.3)	0.102
Procedure: N (%)				0.008
Hemiarthroplasty	874 (71.6)	127 (60.0)	747 (73.8)	
Total Hip Arthroplasty	346 (28.4)	71 (33.0)	275 (27.2)	
ASA Status: N (%)				0.353
I	24 (2.0)	7 (3.3)	17 (1.7)	
II	410 (34.1)	71 (33.0)	339 (34.1)	
III	619 (51.4)	111 (52.0)	508 (50.3)	
IV	131 (10.5)	22 (10.4)	109 (10.7)	
V	55 (4.5)	4 (1.9)	51 (5.1)	<0.001

Table 1: Patient characteristics of the entire cohort, patients given aspirin for VTE prophylaxis, and patients given any other type of VTE prophylaxis.

BMI, Body Mass Index; CCL, Charlson Comorbidity Index; ASA, American Society of Anesthesiologists; SD, Standard Deviation

VTE Prophylaxis (%)	Overall (N = 1,220)	Hemiarthroplasty (N = 874)	THA (N = 346)
Aspirin	214 (17.5)	137 (15.7)	77 (22.3)
Enoxaparin	664 (54.4)	475 (54.3)	189 (54.6)
Apixaban	178 (14.6)	132 (15.1)	46 (13.3)
Clotting agent	75 (6.1)	56 (6.4)	19 (5.5)
Warfarin	43 (3.5)	33 (3.8)	10 (2.9)
Heparin	41 (3.4)	38 (4.3)	3 (0.9)
Rivaroxaban	3 (0.2)	2 (0.2)	1 (0.3)

Table 2: VTE prophylaxis of the study cohort.
 VTE: Venous Thromboembolism; THA: Total Hip Arthroplasty

	Aspirin	Non-aspirin	P-value
n	211	422	
Age: (mean years (range))	79.9 (49-100)	79.9 (49-102)	0.961
Sex: Men (%)	63 (29.9)	117 (27.7)	0.908
Smoking Status: N (%)			
Current Smoker	14 (6.6)	28 (6.6)	
Former Smoker	49 (23.2)	88 (20.9)	
Never Smoker	144 (68.2)	299 (70.9)	
Unknown	4 (1.9)	7 (1.7)	
Race: N (%)			0.968
African American (Black)	5 (2.4)	12 (2.8)	
Asian	22 (10.4)	41 (9.7)	
Other Race	17 (8.1)	31 (7.4)	
Unknown	1 (0.5)	3 (0.7)	
White	166 (78.7)	333 (78.9)	
BMI (mean kg/m ² (range))	24.7 (14.8-60.8)	24.2 (11.7-66.9)	0.168
Surgery Type: N (%)			0.422
Hemiarthroplasty	135 (64.0)	285 (67.5)	
Total Hip Arthroplasty	76 (36.0)	137 (32.5)	
ASA Status: N (%)			0.527
I	7 (3.3)	8 (1.9)	
II	71 (33.6)	150 (35.5)	
III	111 (52.6)	210 (49.8)	
IV	22 (10.4)	54 (12.8)	
V	127 (12.9-317.0)	150 (13.8-72.0)	0.001
CCL (mean (SD))	4.87 (2.30)	4.80 (2.31)	0.526
90-day DVT/PE: N (%)	1 (0.5)	3 (0.7)	1.000
90-day ED Visit: N (%)	40 (19.0)	67 (15.9)	0.388
90-day Readmission: N (%)	22 (10.4)	53 (12.6)	0.314
Non-home Discharge: N (%)	122 (57.8)	203 (48.4)	0.005
Wound Drainage: N (%)	1 (0.5)	1 (0.2)	1.000
Periprosthetic Joint Infection: N (%)	1 (0.5)	4 (0.9)	0.874

Table 3: Matched cohorts of patients on aspirin and patients on other VTE prophylaxis upon discharge.

BMI, Body Mass Index; CCL, Charlson Comorbidity Index; ASA, American Society of Anesthesiologists; DVT, Deep Vein Thrombosis; PE, Pulmonary Embolism; ED, Emergency Department; SD, Standard Deviation

	Aspirin	Enoxaparin	P-value
n	211	422	
Age: (mean years (range))	79.9 (49-100)	78.9 (49-102)	0.886
Sex: Men (%)	63 (29.9)	121 (28.7)	0.928
Smoking Status: N (%)			
Current Smoker	14 (6.6)	28 (6.6)	
Former Smoker	49 (23.2)	88 (20.9)	
Never Smoker	144 (68.2)	285 (67.5)	
Unknown	4 (1.9)	7 (1.7)	
Race: N (%)			0.388
African American (Black)	5 (2.4)	10 (2.4)	
Asian	22 (10.4)	27 (6.4)	
Other Race	17 (8.1)	27 (6.4)	
Unknown	1 (0.5)	3 (0.7)	
White	166 (78.7)	355 (84.1)	
BMI (mean kg/m ² (range))	24.7 (14.8-60.8)	24.9 (14.4-66.9)	0.126
Surgery Type: N (%)			0.109
Hemiarthroplasty	135 (64.0)	298 (70.6)	
Total Hip Arthroplasty	76 (36.0)	124 (29.4)	
ASA Status: N (%)			0.159
I	7 (3.3)	9 (2.1)	
II	71 (33.6)	135 (31.5)	
III	111 (52.6)	208 (49.3)	
IV	22 (10.4)	30 (7.1)	
V	127 (12.9-317.0)	138 (14.9-377.0)	0.046
CCL (mean (SD))	4.87 (2.30)	4.69 (2.11)	0.837
90-day DVT/PE: N (%)	1 (0.5)	2 (0.5)	1.000
90-day ED Visit: N (%)	40 (19.0)	54 (12.8)	0.078
90-day Readmission: N (%)	22 (10.4)	54 (12.8)	0.462
Non-home Discharge: N (%)	122 (57.8)	200 (47.1)	0.001
Wound Drainage: N (%)	1 (0.5)	1 (0.2)	1.000
Periprosthetic Joint Infection: N (%)	1 (0.5)	5 (1.2)	0.664

Table 4: Matched cohorts of patients on aspirin and patients on Enoxaparin for VTE prophylaxis upon discharge.

BMI, Body Mass Index; CCL, Charlson Comorbidity Index; ASA, American Society of Anesthesiologists; DVT, Deep Vein Thrombosis; PE, Pulmonary Embolism; ED, Emergency Department; SD, Standard Deviation