

Table 1. Demographics, medications, and perioperative outcomes after propensity score matching

Variable	Total Knee Arthroplasty			Total Hip Arthroplasty		
	No heparin N=1,334	Heparin N=1,397	P value	No heparin N=900	Heparin N=921	P value
Age in years, mean (SD)	69.8 (8.7)	70.5 (8.2)	0.030	68.5 (10.7)	68.4 (10.5)	0.745
Female sex, n (%)	828 (62.1)	846 (60.6)	0.418	425 (47.2)	425 (46.1)	0.645
Body Mass Index in kg/m ² , mean (SD)	31.9 (5.6)	31.8 (5.4)	0.567	29.8 (5.8)	29.7 (5.6)	0.551
Age-Adjusted CCI, mean (SD)	3.3 (1.6)	3.4 (1.5)	0.070	3.1 (1.7)	3.1 (1.6)	0.667
History of TIA/CVA, n (%)	80 (6.0)	107 (7.7)	0.086	64 (7.1)	58 (6.3)	0.487
Atrial fibrillation, n (%)	199 (14.9)	238 (17.0)	0.131	162 (18.0)	164 (17.8)	0.914
Other thrombophilia, n (%)	6 (0.4)	12 (0.9)	0.186	4 (0.4)	10 (1.1)	0.117
Bleeding diathesis, n (%)	6 (0.4)	12 (0.9)	0.186	5 (0.6)	11 (1.2)	0.144
History of PE, n (%)	41 (3.1)	61 (4.4)	0.075	32 (3.6)	43 (4.7)	0.232
History of DVT, n (%)	87 (6.5)	105 (7.5)	0.310	54 (6.0)	60 (6.5)	0.650
Outpatient antiplatelet use, n (%)	58 (4.3)	57 (4.1)	0.728	52 (5.8)	58 (6.3)	0.642
Outpatient anticoagulant use, n (%)	141 (10.6)	167 (12.0)	0.253	110 (12.2)	121 (13.1)	0.557
Tranexamic acid use, n (%)	1,150 (86.2)	1,095 (78.4)	<0.001	755 (83.9)	691 (75)	<0.001
Estimated blood loss in mL, mean (SD)	65.1 (2.9)	29.3 (1.4)	<0.001	277.7 (213.8)	240.8 (151.4)	0.011
PRBCs transfused in 24 h, mean (SD)	0.0 (0.1)	0.0 (0.0)	0.002	0.0 (0.2)	0.0 (0.2)	0.900
Procedure duration in min, mean (SD)	79.9 (22.3)	87.3 (21.7)	<0.001	77.3 (25.0)	82.0 (21.2)	<0.001

Table 2. Univariate analysis of postoperative thrombotic complications after PSM

Variable	Total Knee Arthroplasty			Total Hip Arthroplasty		
	No heparin N=1,334	Heparin N=1,397	P value	No heparin N=900	Heparin N=921	P value
30-Day Complications						
DVT, n (%)	5 (0.4)	0 (0.0)	0.028	1 (0.1)	3 (0.3)	0.328
PE, n (%)	7 (0.5)	3 (0.2)	0.216	2 (0.2)	3 (0.3)	0.673
MI, n (%)	2 (0.1)	3 (0.2)	1.000	1 (0.1)	2 (0.2)	0.577
CVA, n (%)	2 (0.1)	1 (0.1)	0.616	0 (0.0)	1 (0.1)	0.323
Composite, n (%)	13 (1.0)	7 (0.5)	0.180	4 (0.4)	9 (1.0)	0.177
90-Day Complications						
DVT, n (%)	5 (0.4)	2 (0.1)	0.278	1 (0.1)	3 (0.3)	0.328
PE, n (%)	7 (0.5)	6 (0.4)	0.786	3 (0.3)	3 (0.3)	0.977
MI, n (%)	3 (0.2)	5 (0.4)	0.727	1 (0.1)	2 (0.2)	0.577
CVA, n (%)	3 (0.2)	2 (0.1)	0.680	0 (0.0)	1 (0.1)	1.000
Composite, n (%)	15 (1.1)	7 (0.5)	0.180	5 (0.6)	9 (1.0)	0.303

Background

- Thrombotic complications (DVT, PE, MI, and CVA) can increase mortality in total joint arthroplasty (TJA)
- Intraoperative IV heparin has been used to reduce these complications, but literature has been inconsistent
- We hypothesized that heparin would not reduce 90-day postoperative thrombotic complications

Methods

- After IRB approval, all primary TJA (total knee arthroplasty (TKA) and total hip arthroplasty (THA)) procedures from April 1, 2017 - April 1, 2024, were identified from the EMR
- Complications were identified using a prospectively collected nurse navigator database that used phone calls at 30 and 90 days
- Propensity score matching (PSM) obtained standard mean differences < 0.10 using nearest neighbor method
- Univariate analyses: Student t test or Mann Whitney U test used for continuous variables; chi square used for categorical variables w/ p<0.05 for statistical significance
- Logistic regression used to test association between heparin and composite thrombotic complications (DVT, PE, MI, CVA)

References

1.

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Results

- After PSM, the groups were well matched except for greater EBL in no heparin groups and greater mean number of PRBCs in no heparin (TKA only; **Table 1**)
- TKA: 3,407 patients identified (2,010 no heparin and 1,397 heparin); PSM resulted in 1,334 no heparin and 1,397 heparin
 - Univariate analysis: DVT at 30 days occurred in 0.4% of no heparin and 0% heparin groups; p=0.028 (**Table 2**)
 - Multivariate analysis: heparin did not reduce 90-day thrombotic cx: OR 0.770 (95% CI 0.362 – 1.639; p=0.497)
- THA: 3,132 patients identified (2,211 no heparin and 921 heparin); PSM resulted in 900 no heparin and 921 heparin
 - Univariate analysis: no differences in all cx (**Table 2**)
 - Multivariate analysis: heparin did not reduce 90-day thrombotic cx: OR 1.972 (95% CI 0.625 – 6.222; p=0.247)

Discussion

- This study found that heparin was not associated with a reduction in 90-day thrombotic complications
- Our results expand upon previous studies through the inclusion of additional complications and by extending results to 90 days
- Limitations include the single hospital, the inclusion of multiple surgeons, and possible unreported complications