Tranexamic Acid is Associated with Reduced Rates of Postoperative Bleeding Complications without Increasing Thromboembolic Risk Following Revision Total Hip Arthroplasty

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INTRODUCTION: Tranexamic acid (TXA) is frequently utilized to reduce blood loss in patients undergoing primary total joint arthroplasty. However, the efficacy of TXA during revision total hip arthroplasty (rTHA), a procedure associated with higher rates of blood loss and allogeneic transfusion than primary THA, has been far less studied than primary THA. The purpose of this study was to characterize the efficacy of TXA on bleeding and thromboembolic complications following aseptic both-component rTHA.

METHODS: A large, national database including approximately one-in-four surgeries performed in the United States was queried for patients who underwent aseptic both-component rTHA between 2016 and 2023. Patients who received TXA were subsequently identified (TXA[+] vs TXA[-]). Primary outcomes included 90-day bleeding complications (e.g. transfusion, acute anemia, hematoma, and hemorrhage) and thromboembolic complications (e.g. deep vein thrombosis (DVT), pulmonary embolism (PE), stroke, and myocardial infarction (MI)). To account for residual confounding from patient comorbidities and demographics, multivariable regression analysis was used to compare primary outcomes.

RESULTS SECTION: In total, 39,741 patients were identified who underwent rTHA of which 25,818 (65.0%) received TXA and 13,923 (35.0%) did not. Within the TXA(-) cohort, 8,362 (60.2%) patients were female and 5,521 (39.8%) were male, while in the TXA(+) cohort, 15,012 (58.2%) were female and 10,796 (41.8%) were male. Patients who received TXA had significantly reduced rates of transfusion (adjusted odds ratio [aOR] 0.87, 95%-confidence interval (CI): 0.76-1.00, *P*=0.045) and hemorrhage (aOR 0.75, 95%-CI: 0.58-0.97, *P*=0.027), with no significant differences in rates of acute anemia and hematoma. Rates of DVT, PE, stroke, and MI were comparable between patients who did and did not receive TXA.

DISCUSSION: TXA use was associated with reduced rates of allogeneic blood transfusion without a significant increase in thromboembolic complications. Surgeons should strongly consider TXA in rTHA to minimize postoperative blood loss and risk of transfusion.

SIGNIFICANCE/CLINICAL RELEVANCE: Tranexamic acid is widely used in the setting of primary total hip arthroplasty, however there is little evidence on the safety or efficacy of this perioperative adjunct in the setting of revision total hip arthroplasty. Existing literature is primarily of small cohort studies. Our analysis is among the first and largest to describe the outcomes in patients who received TXA in the setting of rTHA.

IMAGES AND TABLES:

Table 1: Bleeding Complications

90-Day Postoperative Outcomes	No TXA (N= 13,923)		TXA (N= 25,818)		Univariate Regression			Multivariable Regression		
	N	%	N	%	OR	95%-CI	P-Value	aOR	95%-CI	P-Value
Aggregate Bleeding Complications	893	6.4%	1,498	5.8%	0.90	(0.825 - 0.979)	**0.014**	0.96	(0.878 - 1.045)	0.333
Transfusion	363	2.6%	548	2.1%	0.81	(0.708 - 0.926)	**0.002**	0.87	(0.758 - 0.997)	**0.045**
Acute Anemia	657	4.7%	1,133	4.4%	0.93	(0.840 - 1.023)	0.130	0.99	(0.896 - 1.095)	0.853
Hematoma	128	0.9%	283	1.1%	1.19	(0.968 - 1.473)	0.097	1.23	(0.998 - 1.525)	0.052
Hemorrhage	104	0.7%	140	0.5%	0.72	(0.562 - 0.934)	**0.013**	0.75	(0.578 - 0.968)	**0.027**

Table 2: Thromboembolic Complications

90-Day Postoperative Outcomes	No TXA (N= 13,923)		TXA (N= 25,818)		Univariate Regression			Multivariate Regression		
	N	%	N	%	OR	95%-CI	P-Value	aOR	95%-CI	P-Value
Deep Vein Thrombosis	128	0.9%	208	0.8%	0.88	(0.702 - 1.092)	0.238	0.97	(0.772 - 1.210)	0.763
Pulmonary Embolism	69	0.5%	80	0.3%	0.62	(0.452 - 0.862)	**0.004**	0.72	(0.521 - 1.003)	0.052