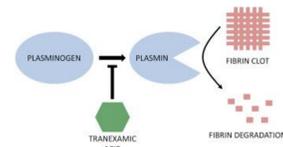


# The Efficacy of Tranexamic Acid for Reducing Blood Transfusion Rates in Extracapsular Hip Fractures

Stefan Yakel, DO; Justin Than, DO; Jennifer Sharp, DO; Olivia Pipitone, MPH; Hiroki Den, MD, MPH; Jacqueline Krummy, MD

## BACKGROUND

- Perioperative blood loss is a common complication of hip fractures, with transfusion rates reported between 19-68%
- Extracapsular fractures have greater blood loss than intracapsular fractures
- Blood transfusions are associated with increased complications
- Tranexamic acid (TXA) is an antifibrinolytic agent used to reduce perioperative blood loss inhibiting fibrinolytic activity preventing fibrin degradation

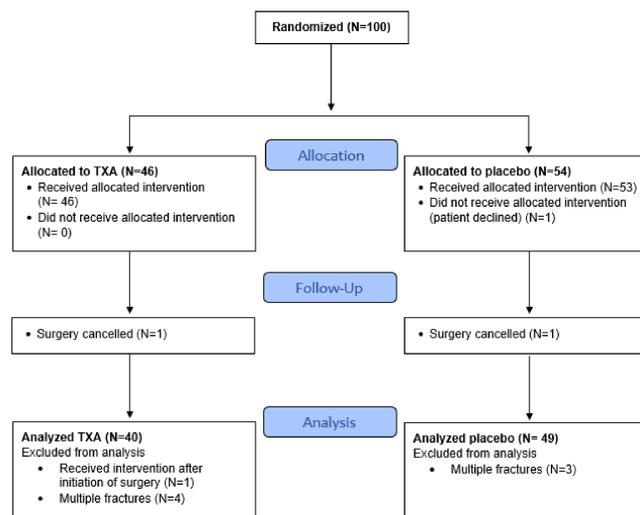


## OBJECTIVES

- Does a single dose of TXA at the time of admission decrease postoperative blood transfusion rates and reduce preoperative blood loss?

## METHODS

- Double-blind randomized controlled trial approved by local IRB
- Patients with closed intertrochanteric or subtrochanteric femur fractures undergoing intramedullary nailing were randomly allocated to receive either 1 gram TXA or normal saline



## RESULTS

### Results: Blood Transfusion

- **17.5%** of TXA group (7/40) and **36.7%** of placebo group (18/49) received a blood transfusion (p=0.046)
- Relative risk of blood transfusion was lower in the TXA group compared to placebo (Relative Risk = 0.48, 95% CI=0.22-1.03)

	TXA (N=40)	Placebo (N=49)
Blood Transfusion	17.5% (7/40)	36.7% (18/49)

### Results: Total blood loss (ml)

- Calculated using the hemoglobin dilution method
- There was a significant difference in blood loss between groups (Mean difference 367 ml, 95% CI 76-657, p=0.01)

		TXA (N=30)	Placebo (N=38)
Total blood loss (ml)	Mean (SD)	1,181.8 (537)	1,548.4 (637)
	Min, Max	329.8, 2611.6	549.9, 3508.8

### Estimated surgical blood loss

- There was no significant difference in surgical blood loss between groups (p=0.95)

		TXA (N=40)	Placebo (N=46)
Estimated Surgical Blood Loss (ml)	Mean (SD)	174.4 (107.6)	179.3 (137.7)
	Min, Max	50, 500	50, 800

- Time from TXA administration to surgery varied anywhere from 23 minutes to 21 hours.
- This led to concern that patients who received the TXA within 3 hours of surgery may have had an additional effect on intraoperative blood loss.
- Subgroup analysis was performed to assess the effect of TXA when administered at least 3 hours prior to surgery.

### Subgroup Analysis Results

- **15.2%** of TXA group (5/33) and **40.0%** of placebo group (18/45) received a blood transfusion (p=0.02)
- Relative risk of blood transfusion was significantly lower in the TXA group compared to placebo (Relative Risk = 0.38, 95% CI = 0.16-0.92)

- No significant differences between groups in patient demographics

		TXA (N=40)	Placebo (N=49)	P Value
Female Gender	% (N)	72.5% (29)	71.4% (35)	0.99 <sup>a</sup>
Age (years)	Mean (SD)	82.2 (10.2)	79.2 (13.0)	0.24 <sup>b</sup>
	Min, Max	56, 98	37, 101	
BMI	Mean (SD)	24.0 (4.3)	24.7 (5.9)	0.54 <sup>b</sup>
	Min, Max	16.7, 34.4	15.5, 43.7	
ASA Score	1	2.5% (1)	4.1% (2)	0.90 <sup>a</sup>
	2	30.0% (12)	22.4% (11)	
	3	62.5% (25)	69.4% (34)	
	4	5.0% (2)	4.1% (2)	
Hemoglobin on hospital arrival (g/dl)	Mean (SD)	12.5 (1.6)	12.6 (1.5)	0.97 <sup>b</sup>
	Min, Max	7.3, 16.0	8.9, 15.8	

		TXA (N=40)	Placebo (N=49)	P Value
Time (hours) from hospital arrival to drug administration	Mean (SD)	5.9 (4.0)	6.1 (3.5)	0.80 <sup>b</sup>
	Min, Max	2.1, 19.3	2.2, 22.6	
Time (hours) from drug administration to initiation of surgery	Mean (SD)	11.1 (6.7)	13.5 (6.5)	0.14 <sup>c</sup>
	Min, Max	0.4, 21.7	0.5, 28.5	
Time from drug administration to initiation of surgery	< 3 hours	17.5% (7)	8.2% (4)	0.28 <sup>a</sup>
	3 - <6 hours	12.5% (5)	4.1% (2)	
	6 - <9 hours	10.0% (4)	10.2% (5)	
	9 - <12 hours	7.5% (3)	16.3% (8)	
	>12 hours	52.5% (21)	61.2% (30)	
	% (N)			

## CONCLUSIONS

- A single IV dose of TXA administered upon hospital arrival decreased the risk of post-operative blood transfusion and average peri-operative blood loss without increasing major complications in patients with extracapsular hip fracture
- No significant difference in length of hospital stay, mortality, or other major complications between groups
- 1 patient in TXA group lost to 30 day follow up
- 2 myocardial infarction cases reported within 30 days of surgery in placebo group

## FUTURE IMPLICATIONS

- Results of this study have led to a change in practice at GSRMC
- All patients now admitted with a hip fracture receive 1g TXA at admission

## REFERENCES & ACKNOWLEDGEMENTS

- All of the references are available upon request or can be found with the full manuscript
- We would like to thank all of the orthopedic residents who reviewed patient inclusion criteria and consented all of these patients in order to make this project a reality
- Thanks to the research department for data analysis