

Topical Tranexamic Acid in Hip Fractures: A Randomized, Placebo-Controlled Double-Blinded Study

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CONFLICT OF INTERESTS DECLARATION

The author declares no financial conflicts of interest relevant to this presentation

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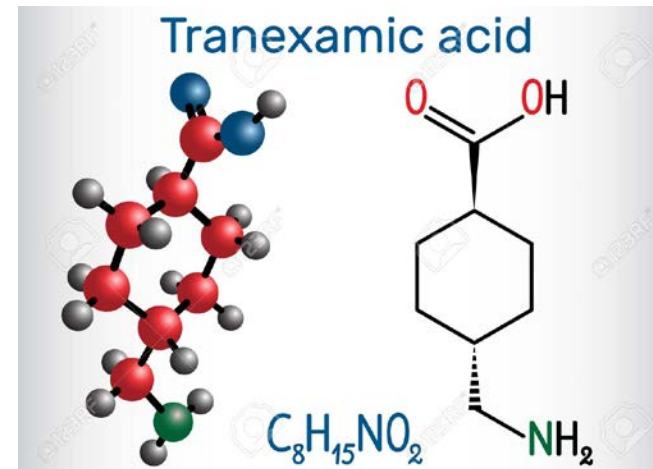
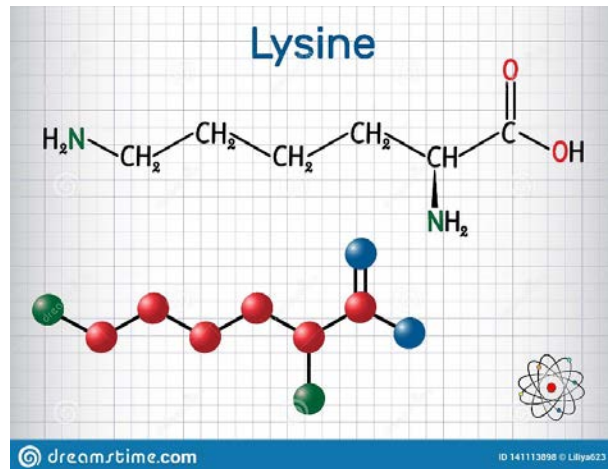
- Dr. G. Elder
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OUTLINE

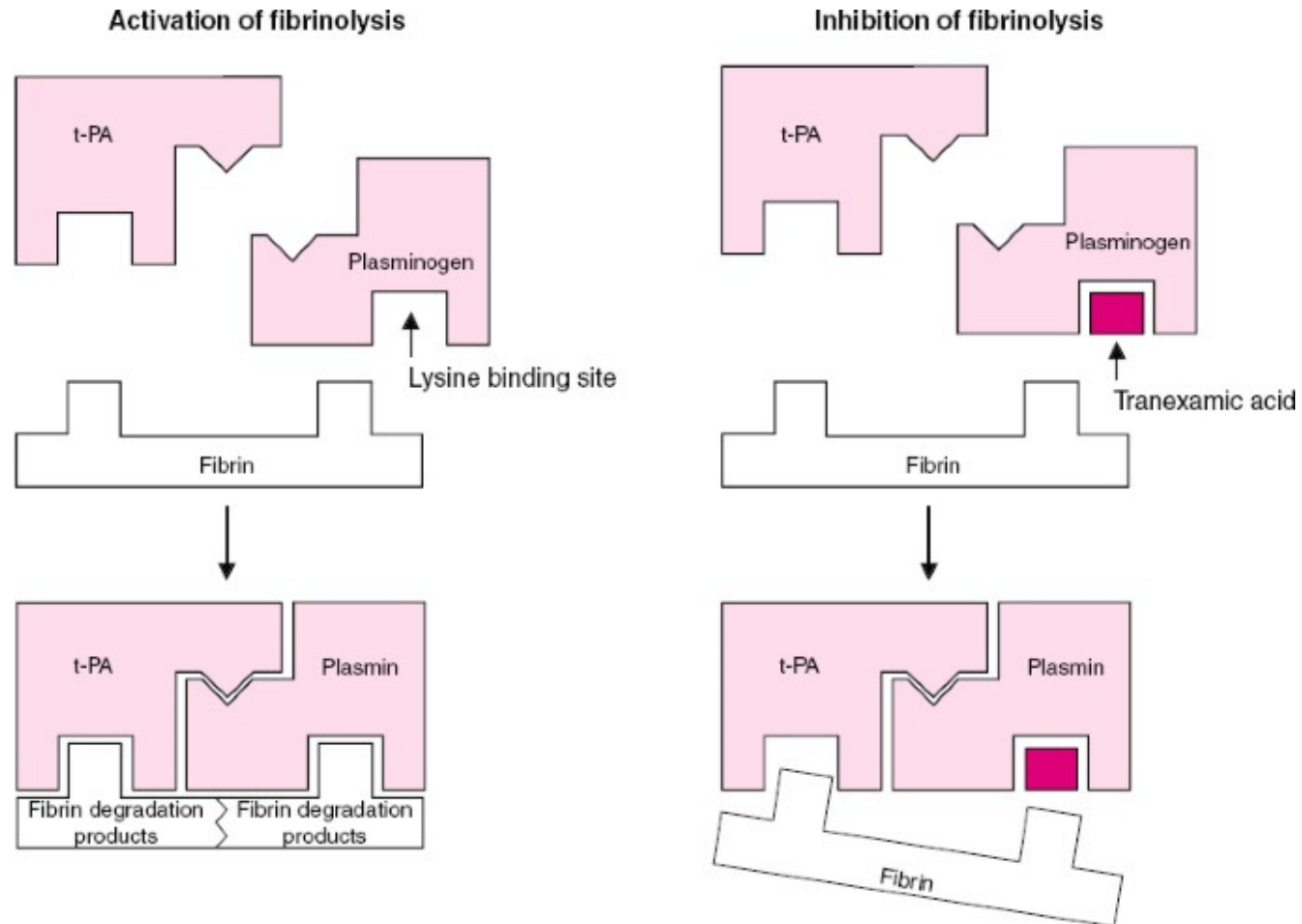
- What is TXA?
- Why topical TXA?
- Topical TXA in Orthopedic Surgery
- Our study findings
- Conclusion

WHAT IS TXA?

- Lysine analogue
- Antifibrinolytic reversibly binds to plasminogen, decreasing plasmin and in turn preventing fibrin degradation



HOW DOES TXA WORK?





WHY TOPICAL TXA?

Topical TXA conceptually causes local reduction of fibrin clot breakdown

The concern for systemic TXA is it might promote thrombotic event (acute coronary syndrome, deep venous thrombosis, pulmonary embolism, cerebrovascular event).

Systemic TXA contraindicated with certain conditions (i.e. previous thromboembolism) and can interact with other anti-fibrinolytic agents.

TXA IN ORTHOPEDICS

Topical Tranexamic Acid Reduces Transfusion Rates in Total Hip and Knee Arthroplasty

Julian Gilbody, MSc, FRCS (Tr&Orth), Herman S. Dhotar, MD,
Anthony V. Perruccio, PhD, J. Roderick Davey, MD, FRCSC

**No difference in total blood loss
with topical vs. IV TXA**

Topical Intra-Articular Compared with Intravenous Tranexamic Acid to Reduce Blood Loss in Primary Total Knee Replacement

A Double-Blind, Randomized, Controlled, Noninferiority Clinical Trial

Enrique Gomez-Barrena, MD, PhD, Miguel Ortega-Andreu, MD, Norma G. Padilla-Eguiluz, PharmD, MPH,
Hanna Pérez-Chrzanowska, MD, and Reyes Figueredo-Zalve, MD

**19.3% vs. 0% transfusion THA
13.1% vs. 0% transfusion TKA**

TXA IN ORTHOPEDICS

Systemic and Topical Use of Tranexamic Acid in Spinal Surgery: A Systematic Review

Sebastian F. Winter¹ Carlo Santaguida² Jean Wong³ Michael G. Fehlings^{2,4}

Global Spine Journal Vol. 6 No. 3/2016

30-70% reduction post-operative blood loss

The influence of topical use of tranexamic acid in reducing blood loss on early operation for thoracolumbar burst fracture: a randomized double-blinded controlled study

Jieliang Shen¹ · Zhengyang Yang¹ · Mengyu Fu¹ · Jie Hao¹ · Wei Jiang¹

**2% vs. 13% transfusion rate
200cc vs. 1000cc average transfusion**

TXA IN ORTHOPEDICS

Effect of topical tranexamic acid on post-traumatic elbow stiffness in patients treated with open arthrolysis: a prospective comparative study

Baokun Zhang, PhD, Wei Zhang, PhD, Jianguang Xu, PhD, Jian Ding, PhD*

18.9% reduction in overall blood loss with topical TXA

Effects of topical tranexamic acid during open reduction and internal fixation of acetabular fractures: A retrospective study

Sandeep Kashyap ^{a,*}, Shweta Mahajan ^b, Mukand Lal ^a

**42% vs. 97% transfusion rate
21 g/dL vs 32 g/dL drop in HgB**

TXA IN LITERATURE

Topical TXA has been extensively studied in various surgical specialties including:

- General surgery: Inguinal hernia repair, mastectomy
- OB/GYN: Abdominal hysterectomy
- Plastic surgery: Reduction mammoplasty
- ENT: Adenoidectomy, FESS
- Cardiac: CABG, cardiac electronic device implantation
- Thoracic: Lung biopsies, lung decortication

Topical tranexamic acid in hip fractures: a randomized, placebo-controlled double-blinded study

OUR RESEARCH

Randomized, double-blinded, placebo-controlled study comparing topical TXA to saline vehicle in hip fracture surgery

Assessment of change in hemoglobin (HgB) on post-operative days 1, 2, & 3, and in blood transfusions between groups

Secondary measures of acute coronary syndrome, DVT/PE, CVA, other major complication, and death

STUDY OBJECTIVE



The purpose of this study was to evaluate the efficacy and safety of topical TXA in hip fracture surgery.

RESULTS

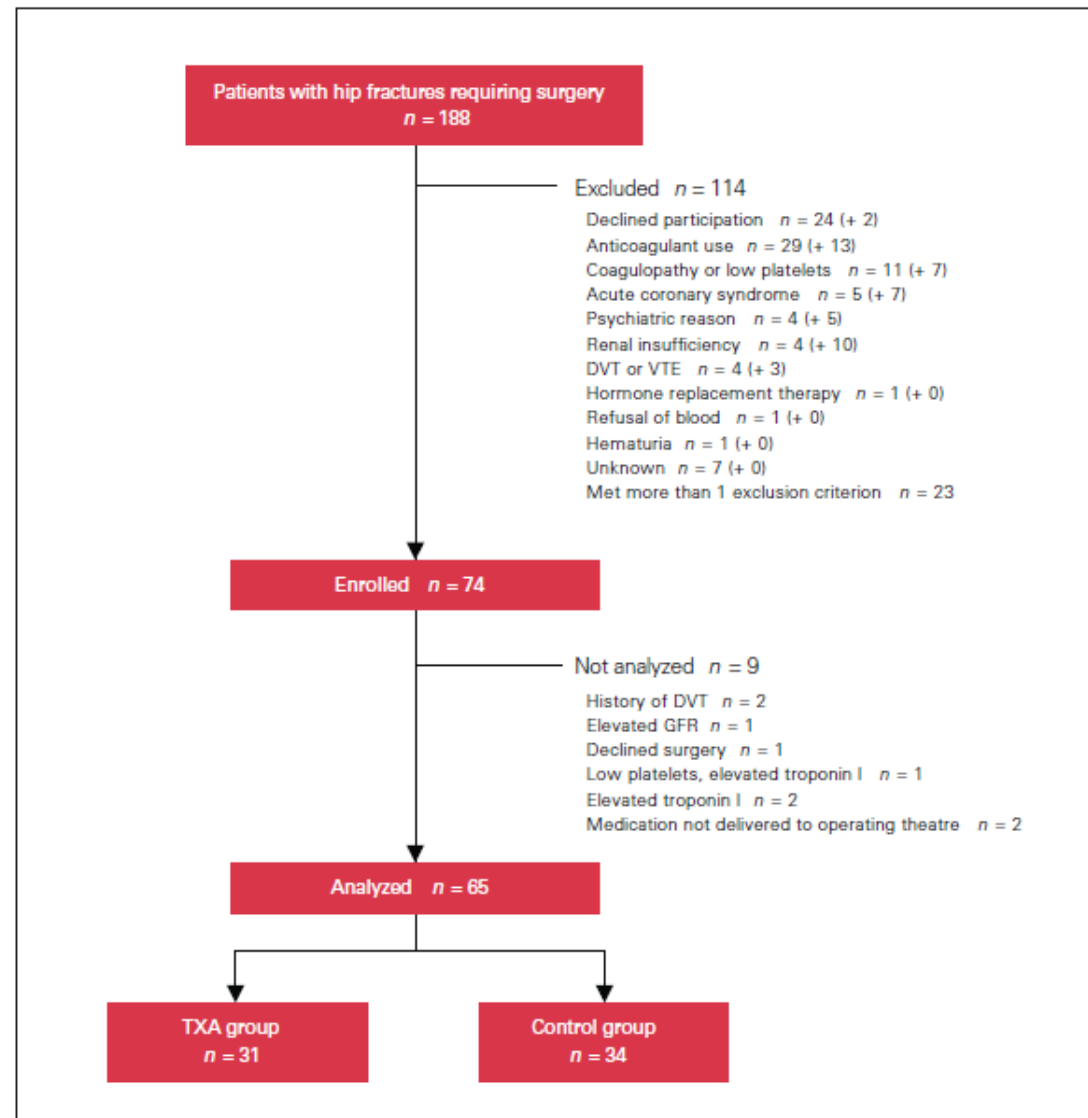


Fig. 1. Overview of study population. Consecutive patients presenting to Sault Area Hospital with hip fracture requiring surgery between November 2017 and February 2019 form the basis of the study. In the list of excluded patients, the values in parentheses indicate the number of patients who were excluded from the study for the listed reason but also met 1 or more additional exclusion criteria. For example, 24 patients were excluded from the study solely because they declined to participate; an additional 2 patients declined to participate and also met at least 1 other exclusion criterion. DVT = deep vein thrombosis; GFR = glomerular filtration rate; TXA = tranexamic acid; VTE = venous thromboembolism.

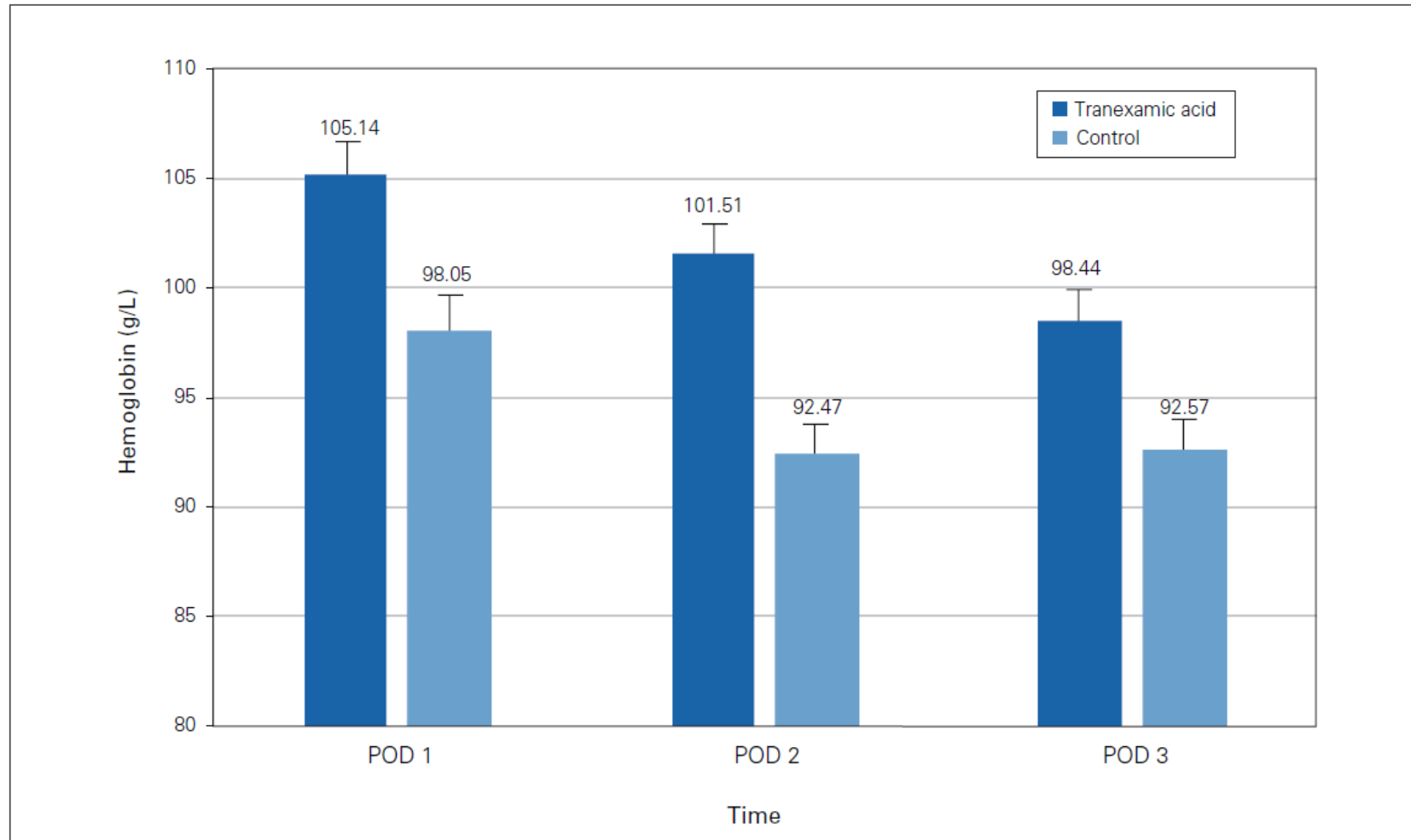


Fig. 2. Adjusted hemoglobin levels on POD 1, 2 and 3 after hip fracture surgery. For POD 1, $p = 0.005$. For POD 2, $p = 0.02$. For POD 3, $n = 0.06$. POD = postoperative day.

Table 2. Transfusion data between groups*

Variable	TXA <i>n</i> = 31	Control <i>n</i> = 34	<i>p</i> value
Transfusion, no. (%)	2 (6.4)	5 (14.7)	0.43†
Total no. of units of pRBC transfused	2	8‡	0.024§

pRBC = packed red blood cells; TXA = tranexamic acid.

*All patients receiving blood after study enrolment were included. Transfusion trigger parameters were hemoglobin level less than 70 g/L, or hemoglobin level less than 80 g/L with symptoms of hypoperfusion.

†From Fisher exact test.

‡One patient in the control group who had a subtrochanteric fracture required an open reduction and received 2 units of pRBC intraoperatively because of hemodynamic instability (i.e., outside of the transfusion parameters), followed by 1 unit of pRBC on postoperative day 1. When the 2 units of pRBC given intraoperatively are excluded, the numbers of units transfused between the groups are no longer significantly different ($p = 0.07$).

§From χ^2 test.

Table 3. Secondary outcomes

Outcome	Study group; no. (%) of patients		<i>p</i> value*
	TXA <i>n</i> = 31	Control <i>n</i> = 34	
VTE†	0 (0)	1 (2.9)‡	1.00
Perioperative ACS†	1 (3.2)	4 (11.8)	0.36
Perioperative CVA†	0 (0)	0 (0)	NA
Postoperative surgical site infection†	1 (3.2)	0 (0)	0.48
All-cause mortality at 90 d postoperatively	2 (6.4)	1 (2.9)	0.60
<p>ACS = acute coronary syndrome; CVA = cerebrovascular accident; DVT = deep vein thrombosis; NA = not applicable; TXA = tranexamic acid; VTE = venous thromboembolism.</p> <p>*From Fisher exact test.</p> <p>†All complications were recorded up to 30 days postoperatively.</p> <p>‡Denotes 1 case of DVT in the control group.</p>			



CONCLUSION

- Topical TXA reduces early perioperative blood loss without increasing complications in patients undergoing surgery for a hip fracture.
- Routine addition of this 3-minute step to the surgical management of hip fractures may help minimize perioperative blood loss in this frail population.

THANK YOU
