

Utilization, Effectiveness, and Safety of Tranexamic Acid Use in Hip Fracture Surgery

Zoe Beatrice Cheung MD; David Forsh MD; Shawn G Anthony MD; Jeremy Podolnick MD; Nicole Zubizarreta MPH; Jashvant Poeran MD

Icahn School of Medicine at Mount Sinai, New York, NY, United States

Purpose: Total blood loss in hip fractures, including intraoperative and hidden blood loss, may be as high as 1500 mL. Blood loss and blood transfusion have been strongly associated with perioperative complications, including infection, prolonged hospital stay, and increased cost. One potential strategy to decrease perioperative blood loss and blood transfusion is the use of tranexamic acid (TXA). TXA has been increasingly used in orthopaedic surgery for upper and lower extremity arthroplasty, but limited data exist for its use in patients undergoing hip fracture surgery. The objective of this study was to assess the frequency of use, effectiveness, and safety of TXA in hip fracture surgery in the United States.

Methods: A retrospective cohort study of patients who underwent hip fracture surgery was performed using national claims data from the Premier Healthcare database (2006-2016 and 2014-2016 periods for trend analysis and multivariable analysis, respectively). We applied a 1:3 propensity score matching approach to assess associations between TXA use (the main intervention) and blood transfusion risk, inpatient perioperative complications (including acute myocardial infarction, acute renal failure, and venous thromboembolism), length of stay (LOS), and cost of hospitalization. Odds ratios (ORs) and 95% confidence intervals (CIs) were reported.

Results: Overall, TXA was used in only 2.5% (3812/153,169) of patients, with increasing use from 0% in 2006 to 3.2% in 2016. In contrast, the incidence of blood transfusion decreased from 33.1% in 2006 to 20.6% in 2016. After adjusting for relevant covariates, TXA use was associated with a 17% decrease in odds of blood transfusion (OR 0.83; 95% CI 0.74-0.92; $P < 0.05$) with no significant increase in the risk of perioperative complications (OR 0.98; 95% CI 0.83-1.16; $P = 0.80$). Moreover, TXA use was associated with a 16% shorter LOS and minimal effects on cost of hospitalization (+2.8% change in cost).

Conclusion: While TXA utilization remains low in hip fracture surgery patients in the United States, it is associated with a significant decrease in transfusion risk with no increase in complications. TXA use appears to be safe and efficacious in hip fracture patients, and our findings support a wider use of TXA in this surgical cohort.