What is the Best Method of Tranexamic Acid Administration in Extracapsular Hip Fractures? A Meta-analysis of Randomized Controlled Trials

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INTRODUCTION:

While tranexamic acid (TXA) was shown to be useful in some reports, its efficacy and optimal administration route as a prophylactic measure for bleeding control in extracapsular fractures remains debatable. Randomized controlled trials (RCTs) have provided varying benefit of this prophylactic medication. Therefore, a meta-analysis of RCTs would be helpful in informing clinicians, with the goal of paving the way for evidence-based and standardized utilization of TXA for extracapsular hip fractures.
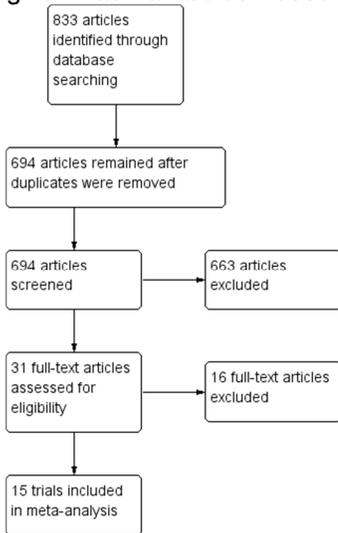
METHODS:

PubMed, Cochrane, Embase, and Google Scholar were searched up until January 6, 2025. Inclusion criteria consisted of English or non-English-language RCTs studying the impact of TXA use in extracapsular hip fractures. The studied outcomes were the risks of thromboembolic events (TEE), hematoma formation, transfusion, blood loss, and hemoglobin drop (HbD).

RESULTS:

A total of 15 RCTS, which included 1,619 patients of whom 800 (49.4%) and 819 (50.6%) were randomized to TXA and control, respectively, were analyzed. We found no difference in the risk of TEE, and hematoma formations. However, a lower rate of transfusions was seen in the TXA group (odds-ratio 0.33 [95% CI 0.26 to 0.42]; $p < .001$), a finding that was pronounced the most when TXA was given only pre-operatively. Furthermore, patients in the TXA group had a lower intra-operative blood loss (IBL) (mean-difference -43.80ml [95% CI -76.85 to -10.76]; $p = 0.009$), hidden blood loss (HBL) (standardized mean-difference -1.25 [95% CI -1.93 to -0.56]; $p < .001$), total blood loss (mean-difference -227.01ml [95% CI -250.41 to -203.60]; $p < .001$), and HbD (mean-difference -0.81 [95% CI -0.97 to -0.64]; $p < .001$). However, when given at admission, TXA did not reduce IBL. In addition, when given at 1g TXA did not reduce either IBL or HBL.

DISCUSSION AND CONCLUSION:

This meta-analysis revealed that TXA administered pre-operatively only showed the lowest rates of blood transfusion, and given as a bolus dose of 10mg/kg showed a reduction in both intraoperative and hidden blood loss.