

The Effect of Tranexamic Acid on Reducing Blood Loss and Transfusion Rates in Total Ankle Arthroplasty: A Systematic Review and Meta-Analysis of Clinical Comparative Studies

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BACKGROUND

- Peri-operative blood loss during joint replacement procedures is a modifiable risk factor that impacts wound complications, hospital stay and total costs.

- Tranexamic acid (TXA) is an anti-fibrinolytic that has been widely used in orthopedic surgery, but its efficacy in the setting of total ankle arthroplasty (TAA) has not been quantified to date.

OBJECTIVE

The purpose of this systematic review and meta-analysis was to evaluate the efficacy and safety of administering TXA in patients undergoing TAA.

METHODS

- The Medline, Embase and Cochrane library databases were systematically reviewed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.

- Five comparative studies examining blood loss following administration of TXA for patients undergoing TAA were included.

- The outcome measures of interest were blood loss, reduction in hemoglobin concentration, transfusion requirements, total complications and wound complications.

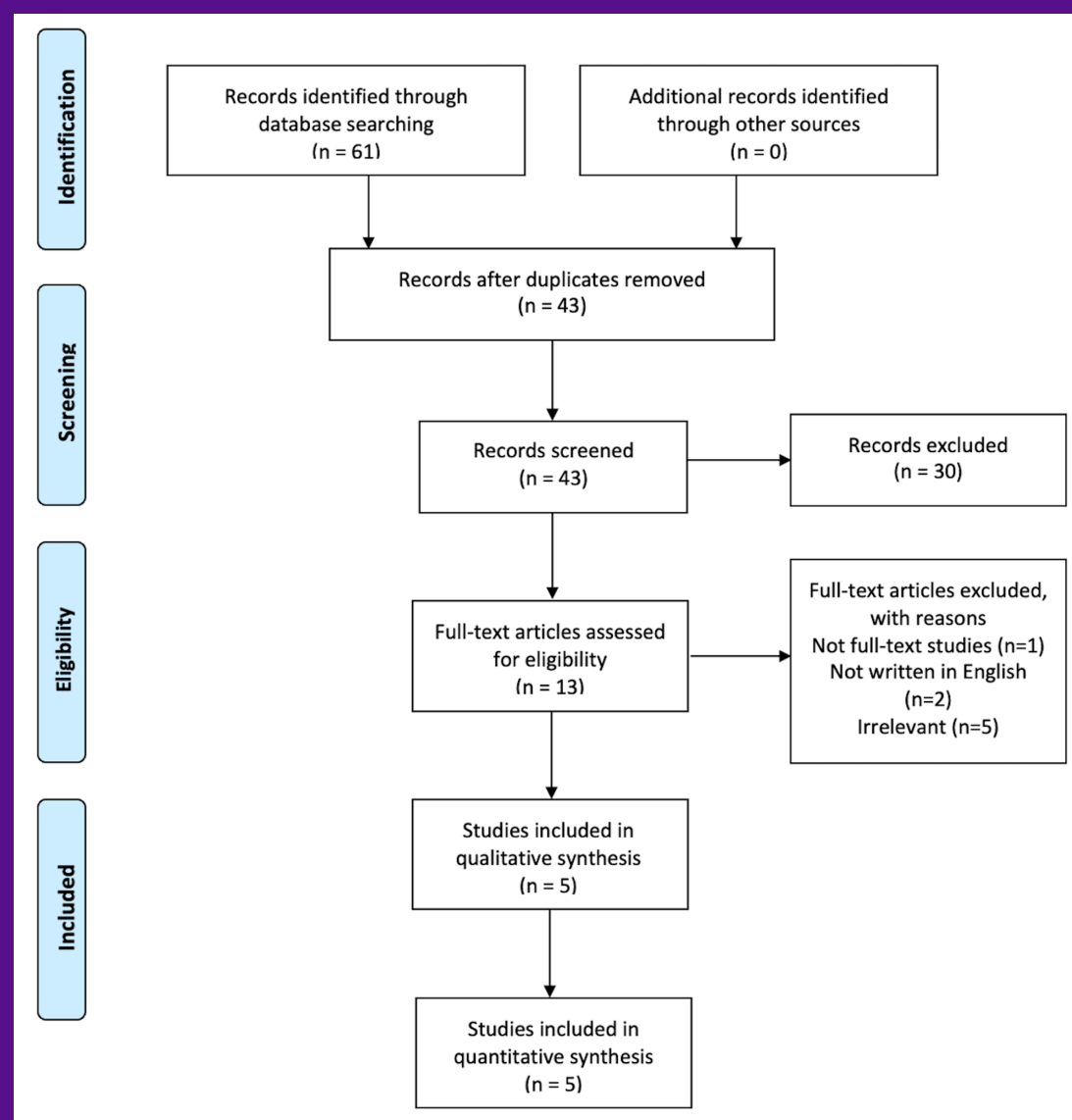


Figure 1. PRISMA Flow Diagram

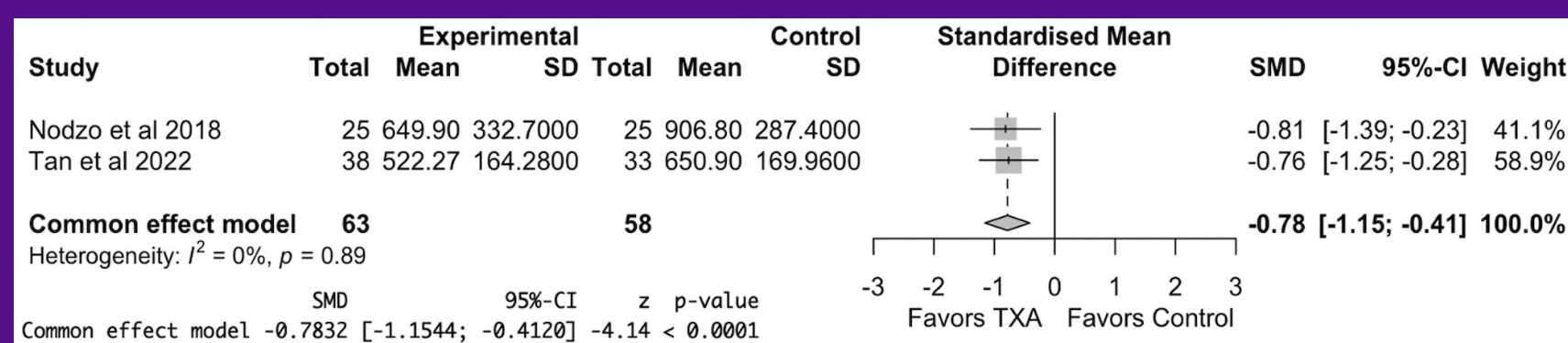


Figure 2. Forest plot of total blood loss following TAA

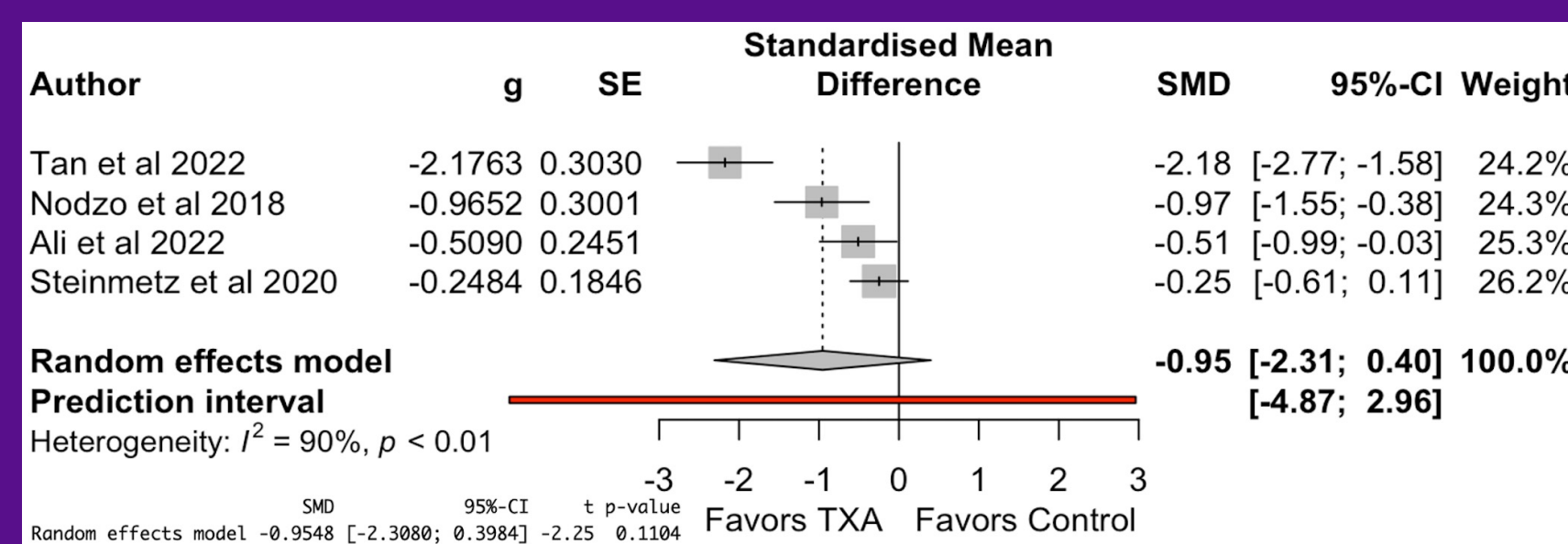


Figure 3. Forest plot of hemoglobin loss following TAA

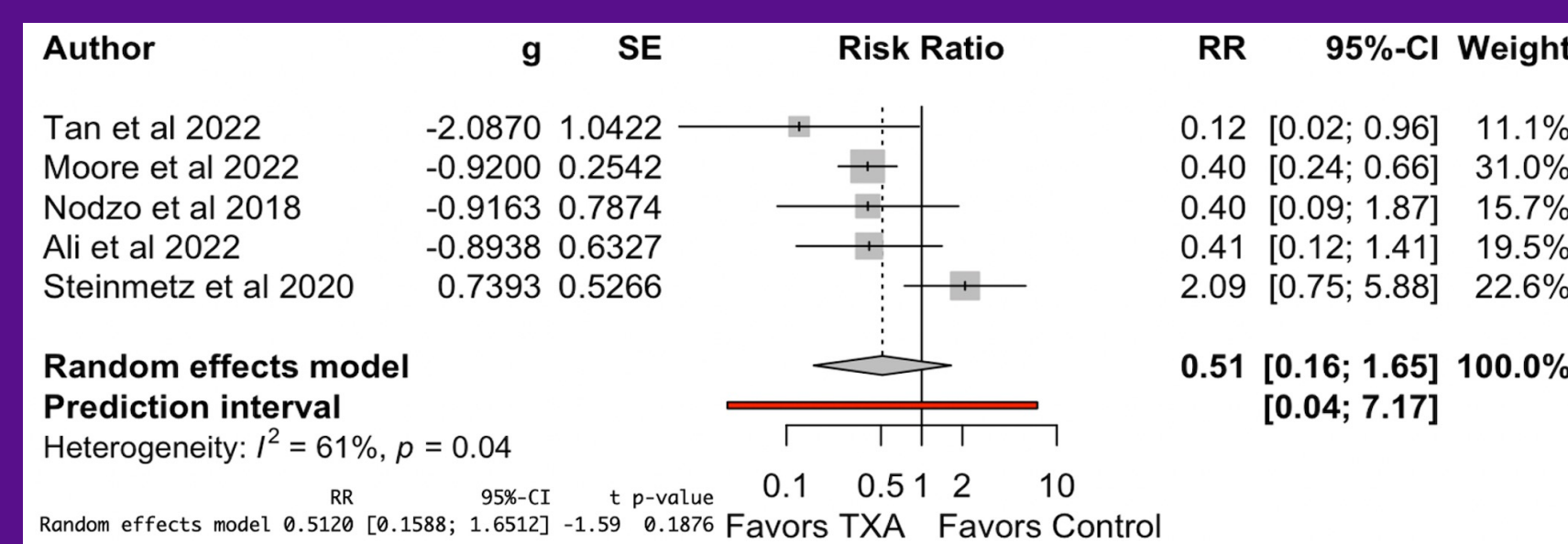


Figure 4. Forest plot of total complications following TAA

RESULTS

- In total, 194 patients received TXA and 187 patients did not receive TXA while undergoing TAA.

- Based on the common-effects model for total blood loss for the TXA group versus control, the standardized mean difference (SMD) was -0.7832 (95% CI, -1.1544, -0.4120; $P < .0001$), in favor of **lower total blood loss for TXA**.

- Based on the random-effects model for reduction in hemoglobin for the TXA group versus control, the SMD was -0.9548 (95% CI, -1.7850, -0.1246; $P = .0242$) in favor of **lower hemoglobin loss for TXA**.

- Based on the random-effects model for total complications for the TXA group versus control, the risk ratio was 0.51 (95% CI, 0.1588, 1.6512; $P = .1876$), in favor of **lower total complications for TXA but this was not statistically significant**.

CONCLUSIONS

- This current review demonstrated that administration of TXA led to a reduction in blood loss and hemoglobin loss without an increased risk of the development of venous thromboembolism in patients undergoing TAA.

- No difference was observed with respect to total complication rates between the TXA cohort and the control group.

- TXA appears to be an effective hemostatic agent in the setting of TAA, but further studies are necessary to identify the optimal timing, dosage and route of TXA during TAA.