Combined Intra-articular and Intravenous Tranexamic Acid Significantly reduce Blood Loss in Knee Arthroplasty

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Background: In total knee arthroplasty (TKA) both systemic and topical administration of tranexamic acid (TXA) has been proven to reduce blood loss in several RCT´s though routine use of systemic TXA is considerably more common. However, additional benefit of topical TXA in addition to systemic TXA has not previously been investigated.

Purpose / Aim of Study: The aim was to evaluate if combined topical and systemic TXA administration reduced total blood loss compared to systemic TXA alone.

Materials and Methods: In this randomized, double-blind, placebo-controlled, trial 60 patients scheduled for TKA were assigned to receive either 1) combined TXA administration 1 g intravenously (IV) preoperatively + intra-articular (3 g TXA diluted in 100 ml saline) prior to wound closure (TXA IA + IV) or 2) 1 g TXA IV alone + 100 mL saline intra-articular (TXA IV + placebo). IA TXA was administrated through a puncture needle. Primary outcome was 24 h calculated blood loss. Secondary outcomes were blood loss on 2nd postoperative day, thromboembolic complications and transfusion rate. Blood loss was calculated by hemoglobin differences.

Findings / Results: Data on primary outcome was available for all 60 included patients. 24 h blood loss was 466 (SD±313) mL in the TXA IV + IA vs. 743 (SD±358) mL in the TXA IV + placebo group, treatment effect 277 (95% CI 103 – 451; p = 0.002) mL. 2nd day blood loss was 644 (SD±382) mL in the TXA IV + IA vs. 1017 (±519) mL in the TXA IV + placebo group, treatment effect 373 (95% CI 132 – 614; p = 0.003) mL. No thromboembolic complications were observed within 90 days postoperatively.

Conclusions: The combined administration of systemic and intra-articular TXA resulted in a clinically relevant reduction in blood loss of 37% both 24 h and 2nd day after surgery compared to intravenous TXA alone. No thromboembolic events were observed.