

Weighted versus Uniform Dose of Tranexamic Acid in Patients Undergoing Primary, Elective Knee Arthroplasty: A Prospective Randomized Controlled Trial

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Introduction: The goal of this study was to evaluate the effectiveness of a uniform versus weighted dose of tranexamic acid (TA) in reducing intraoperative and postoperative blood loss during primary Total Knee Arthroplasty (TKA).

Methods: In a prospective, randomized, double-blinded, controlled study, TA was injected before tourniquet release during primary TKA in two study groups (50 patients). Group 1 (n=25) received a uniform 1g dose, and group 2 (n=25) received a weighted 20mg/kg single dose. All surgeries were performed by the senior author via a midvastus approach using a tourniquet for the duration of the procedure. Postoperative protocols and anticoagulation were standardized following institutional TKA pathways.

Results: For the uniform dose group, intraoperative blood loss was $100.00 \pm 31.69\text{mL}$ (25-300mL), postoperative blood loss was $193.75 \pm 55.72\text{mL}$ (35-495mL), and total blood loss was $293.75 \pm 77.96\text{mL}$ (135-795mL). For the weighted dose group, intraoperative blood loss was $65.00 \pm 8.50\text{mL}$ (25-100mL), postoperative blood loss was $291.50 \pm 83.31\text{mL}$ (0-960mL), and total blood loss was $356.50 \pm 77.61\text{mL}$ (range 100-985mL). There was no significant difference between groups with intraoperative, postoperative, and total blood loss ($p = 0.256, 0.370, \text{ and } 0.581$, respectively).

For the uniform dose group, postoperative hemoglobin (Hb) decreased by $2.56 \pm 0.38 \text{ g/dL}$ (1.6-4.4 g/dL), and in the weighted dose group, Hb decreased by $2.23 \pm 0.425 \text{ g/dL}$ (1.1-5.1 g/dL). There was no significant difference between the two groups in Hb change ($p = 0.591$). There has been 1 adverse event in each group, and 2 blood transfusions were given to one patient in the weighted dose group while none in the uniform dose group.

Discussion: The lack of significant statistical difference between groups with the numbers available for study, suggests that a single 1-gram dose can be used with the same efficacy as a weighted 20mg/kg single dose.

