Effect of Intraoperative Tranexamic Acid on Perioperative Massive Hemorrhage Requiring Transfusion in Patients Undergoing Elective Spine Surgery: A Propensity Score-Matched Analysis Using a National Inpatient Database

Abstract

Objective: This study aimed to examine whether the use of intravenous TXA in elective spine surgery is associated with reduced perioperative massive hemorrhage requiring transfusion.

Methods: We extracted all patients who underwent decompression with or without fusion surgery for the cervical, thoracic, and lumbar spine between April 2012 and March 2019. The primary outcome was the occurrence of massive hemorrhage requiring transfusion, defined as at least 560 mL of blood transfusion within 2 days of spine surgery or the requirement of additional blood transfusion from 3–7 days postoperatively. Secondary outcomes were the occurrence of thrombotic complications (pulmonary embolism, acute coronary syndrome, and stroke) and postoperative hematoma requiring additional surgery.

Results: We identified 83,821 eligible patients, with 9,747 (12%) patients in the TXA group. Overall, massive hemorrhage requiring transfusion occurred in 781 (0.9%) patients. Propensity score matching yielded 8,394 pairs. In the matched cohort, the TXA group had a lower proportion of massive hemorrhage requiring transfusion than the control group (0.7 % vs. 1.1%; p=0.002). There was no significant difference in the occurrence of thrombotic complications and postoperative hematoma requiring additional surgery between both groups. The multivariable regression analysis also showed that the use of TXA was associated with significantly lower proportions of massive hemorrhage requiring transfusion

(odds ratio, 0.62; 95% confidence interval, 0.43–0.90; p=0.012).

Conclusions: In this analysis using real-world data, TXA use in elective spinal surgery was associated with reduced perioperative massive hemorrhage requiring transfusion without increasing thrombotic complications.

Abbreviations: TXA, tranexamic acid