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Preoperative TXA Lowers Venous Thromboembolism Risk Following Orthopedic Procedures

Abstract:

Background: Tranexamic acid (TXA) is widely used in orthopedic surgeries to reduce blood loss, but concerns persist regarding its association with thromboembolic complications. This study aimed to compare the incidence of thromboembolic events in patients undergoing spine, knee, or hip surgeries with and without perioperative TXA administration.

Methods: Using TriNetX, a federated electronic health record network, we identified 236,482 matched patients in each cohort: one receiving TXA and one not receiving TXA during orthopedic surgery. Propensity score matching was performed on demographics and comorbidities. Outcomes included the incidence and frequency of thromboembolic events within one day post-surgery. Statistical analyses included risk ratio, odds ratio, Kaplan-Meier survival analysis, and t-tests.

Results: The TXA group demonstrated a lower incidence of thromboembolic events (0.064%) compared to the non-TXA group (0.092%), corresponding to a risk ratio and odds ratio of 1.43 (95% CI: 1.16–1.76, $p = 0.001$). Kaplan-Meier analysis revealed significantly higher event-free survival in the TXA group (99.94% vs. 99.91%, $p = 0.001$). The average number of event instances per patient was not significantly different (TXA: 1.066 vs. No TXA: 1.055; $p = 0.676$).

Conclusions: This large-scale, real-world analysis demonstrates that TXA use in orthopedic surgery is associated with a significantly reduced risk of early postoperative thromboembolic events. The results support TXA's continued use in perioperative protocols, with no evidence of increased event burden among affected patients. Future studies should evaluate longer-term outcomes and specific surgical subtypes.