



Tranexamic Acid – Golden in the golden hours of trauma?

CLINICAL QUESTION

Does Tranexamic acid (TXA) in general adult trauma or traumatic head injuries improve mortality or disability without increased risk of adverse events?

BOTTOM LINE

Giving TXA to adult trauma patients within 3 hours of injury reduces overall mortality from 16% with placebo to 14.5% at 28 days. Giving TXA to isolated head injury patients within 3 hours decreases head injury death in patients with Glasgow Coma Scale (GCS) >3 (from 14% with placebo to 12.5%), largely driven by improvements in patients with GCS 9-15. Serious adverse events were similar to placebo.

EVIDENCE

- Two large randomized, placebo-controlled trials of intravenous TXA (1g over 10 minutes, then 1 g over 8 hours) in adult trauma. Patients >80% male, median age 35-42 years. Outcomes at 28 days.
- General trauma: 20,211 patients with signs of shock or risk of significant hemorrhage, presenting within 8 hours of injury. 31% had co-existing head injury.^{1,2}
 - All-cause mortality: 14.5% versus 16% placebo; number needed to treat (NNT)=67.
 - Only treatment ≤3 hours improved mortality (treatment >3 hours: No difference).

- Adverse events: Vascular occlusive event (myocardial infarction, stroke, pulmonary embolism) 1.7% versus 2.0% placebo, not statistically different.
- Traumatic brain injury: 12,737 patients with GCS of ≤ 12 or intracranial bleeding on CT and no major extracranial bleeding.^{3,4} Allowable time post-injury changed from 8 to ≤ 3 hours during study. Outcomes [for patients presenting ≤ 3 hours (N=9202)]:
 - All-cause mortality: No difference.
 - Head injury mortality (overall): No difference.
 - Analyzed by severity of head injury (some pre-specified):
 - Excluding GCS 3: 12.5% versus 14% placebo NNT=67.
 - GCS 3-8 no difference.
 - GCS 9-15: 5.8% versus 7.5% placebo NNT=59.
 - Disability scores similar between groups.
 - Adverse events: No difference.
 - Limitation: No statistical correction for multiple sub-group analyses.
- Systematic reviews^{5,6} dominated by above studies found similar outcomes.

CONTEXT

- Hemorrhage causes 20-45% of trauma deaths.^{7,8,9}
- Guidelines recommend using TXA within 3 hours in:
 - “Severely injured bleeding patients”.¹⁰
 - “Patients with major trauma and active or suspected bleeding”.¹¹
- Pre-hospital TXA did not improve:
 - Mortality in general trauma.¹²
 - Neurological outcomes in traumatic brain injury patients.¹³

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AUTHORS

Jennifer Young, MD CCFP(EM),
Elfriede Cross, MD FRCPC,
Michael R Kolber, MD CCFP
 MSc.

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