Canadian Journal of Emergency Medicine (2024) 26:86–87
https://doi.org/10.1007/s43678-023-00642-8

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Prehospital tranexamic acid: more than just a PATCH for trauma systems?

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Received: 5 November 2023 / Accepted: 27 December 2023 / Published online: 17 January 2024

Full Citation: PATCH-Trauma Investigators and the ANZICS Clinical Trials Group, Gruen RL, Mitra B, et al. Prehospital Tranexamic Acid for Severe Trauma. *N Engl J Med*. 2023;389(2):127-136.

Abstract Link: https://doi.org/10.1056/NEJMoa2215457

Article Type: Therapy (Clinical Trial)

Ratings: *Methods*—4/5, *Usefulness*—3/5

Introduction

Background

Trauma is a leading cause of morbidity and mortality among young people [1]. A third of those avoidable deaths are due to bleeding, often ex by trauma-induced coagulopathy (TIC). Tranexamic acid (TXA) has been investigated for this indication, but randomized-controlled trials (RCT) produced mixed results [2, 3].

Objectives

To determine if prehospital TXA administration increases the likelihood of survival with a favorable functional outcome among severely injured trauma patients.

Methods

Design

Multicenter, double-blind, placebo-controlled RCT.

Setting

Recruitment from 15 emergency medical services and 21 hospitals in Australia, New Zealand, and Germany.

Population

Adult trauma patients suspected to have severe traumatic injuries and to be at high risk of TIC. Patients were required to be treated on scene, transported by road or air ambulance to a participating trauma center, and be able to receive TXA within 3 h of injury.

Intervention

Patients received either placebo or TXA as a bolus dose of 1 g during the prehospital phase, followed by a 1 g infusion over 8 h after arrival at the receiving hospital.

Outcomes

The primary outcome was survival with a favorable functional outcome at 6 months, assessed using the Glasgow Outcome Scale Extended (GOS-E).

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Results

1310 patients were randomized in the TXA (661) or placebo (646) group. The primary outcome occurred in 53.7% of patients in the treatment group compared to 53.5% in the control group [risk ratio (RR) 1.00; 95% CI 0.9–1.12]. There was no difference in the results between the lower and higher GSC groups.

Mortality at 24 h occurred in 9.6% of patients in the TXA group compared to 14.1% in the placebo group (RR 0.69; 95% CI 0.51–0.94). Mortality at 28 days occurred in 17.3% of patients in the treatment group compared to 21.8% in the placebo group (RR 0.79; 95% CI, 0.63–0.99). There were more survivors with poor neurological outcomes in the TXA group.

There was no statistically significant difference in the mortality at 6 months, the frequency of vascular occlusion, the number of units of blood products used in the first 24 h, or the incidence of adverse events.

Appraisal

Strengths

- Randomization with stratification according to the GSC.
- Strong study design.
- The primary outcome was patient-centered.
- Significant trauma population.

Limitations

- Loss to follow-up was high at 13%.
- High rate of protocol violations.
- There are no data regarding the total of patients screened and the reasons for exclusion.
- The COAST score is infrequently used in clinical setting.
- Other injuries unrelated to initial TIC may limit the patient's functionality.
- Improvements from post-traumatic limitations are still possible after 6 months.
- Primary outcome is debatable to assess an acute trauma intervention that would benefit early mortality.
- Transport times are not provided. Would the intervention apply to Canadian urban EMS systems with short transport times?

Context

TXA is an antifibrinolytic agent notably used in trauma-associated hemorrhage. Many studies investigated its role in treating TIC with mixed results. The CRASH-2 study demonstrated an absolute reduction in mortality of 1.5% in traumatized patients, but no other large study has replicated those findings [2]. The CRASH-3 trial failed to demonstrate a difference in mortality with TXA for patients with TBI [3]. These studies showed no significant harm associated with TXA treatment for traumatic conditions. The current recommendation by our local trauma experts is to treat trauma patients at risk of significant bleeding presenting less than 3 h after their injury with TXA. At this time, no convincing data suggest that inducing delays and increasing resource utilization in the prehospital phase to administer TXA are beneficial to trauma patients.

Bottom line

Trauma care extends beyond the resuscitation room. Despite showing a trend toward an increase in early survivors, the PATCH trial does not provide evidence supporting the use of TXA in the prehospital setting regarding long-term survival with favorable functional outcome. Based on current knowledge, prehospital resources should not be diverted from other life-saving interventions to prioritize TXA administration.

Declarations

Conflict of interest None to declare.

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