

THE TIMELY USE OF TRANEXAMIC ACID IN TRAUMA

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Background

In April 2014 the New Brunswick Trauma Program (NBTP) implemented a provincial, web-based trauma registry. At each of New Brunswick's (NB) level I, II and III trauma centres, Registered Nurses (RN) capture the use of tranexamic acid (TXA) on all trauma in-patient admissions occurring through the emergency department (ED) or those transferred from another trauma centre.

The CRASH-2 trial indicated that for qualifying trauma patients, administration of TXA within the first 3 hours of injury is important to ensure clinical benefit and safety. Following implementation of a provincial massive transfusion protocol in January 2013 that included early consideration of TXA in the setting of major trauma or potential for hemorrhage, we sought to confirm whether TXA administration was completed within recommended timeframes.

During the study period there were several methods used to increase awareness among healthcare professionals about the recommendations from the CRASH-2 trial. These included but were not limited to:

- Implementation and education of a provincial massive transfusion policy for ED staff
- Educational offerings through provincial trauma rounds, Rural Trauma Team Development Course®, Advanced Trauma Life Support Course®, Trauma Nursing Core Course™, trauma simulation, and individual case review with attending physicians

- Resources developed for use to assist with coordination of trauma transfers, included:

- Trauma Control Physician (TCP) information booklet with guidance about specialist availability, processes, and clinical care including administration of TXA and dosing recommendations
- A Trauma Transfer Checklist poster located within all trauma centres that includes a reminder about TXA administration (fig 1)
- Email to nursing and physician leaders in all EDs, reminding them to make early contact with the trauma transfer system
- Trauma transfer guidance sheet for referring physicians to use when speaking with TCP (fig 2)

- In addition TCPs were sent reminders by email to encourage:

- Early call to Toll Free Trauma Referral Line
- Early use of TXA

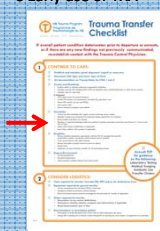


Figure 1: Trauma Transfer Checklist



Figure 2: Trauma Transfer report

Methods

The NBTP provincial trauma registry allows for review of the use of TXA in trauma patients who were either initially assessed at level I, II or III trauma centre ED or received in transfer to the ED of one of those centres after initial assessment at a level V trauma centre. Trauma Nurses reviewed the charts of all trauma patients who presented to hospital between April 1, 2014 and September 30, 2015 and recorded those who received TXA within an existing data field established for this purpose. Time of injury, time of TXA bolus administration and confirmation of intravenous TXA infusion was extracted and analyzed

Results

52 patients received TXA during the study period. Of these 52 patients, 48 arrived by ambulance and 4 by private vehicle. They ranged in ages from 15 to 95 years old.

With respect to mechanism of injury 60% were motor vehicle related (including ATV, motorcycle, pedestrian and passenger vehicle); 17% penetrating; 12% falls; 11% other

39 of the 52 patients received a TXA bolus within 3 hours of the best documented time of injury, and 15 also received TXA infusion (figure 3).

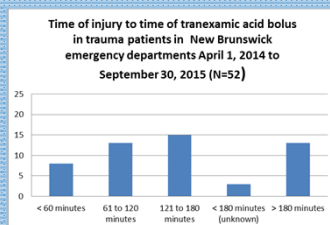


Figure 3: Time of injury to time of tranexamic acid bolus

Discussion

By analyzing the data it is noted that 75% of the 52 patients received a TXA bolus within 3 hours of the best documented time of injury, and 29% received TXA infusion. 25% (13/52) of patients received TXA outside the recommended window of 3 hours. Only 1 patient arrived at hospital beyond the 3 hours from time of injury, meaning 98% of patients could have received TXA within 3 hours of injury if given during initial ED assessment.

Upon reviewing patient disposition, it appears that patients who received TXA were appropriately selected candidates, although this requires more detailed analysis. Of the 52 patients who received the bolus of TXA, 90% were admitted to hospital (65% ICU and 25% ward); 6% died in ED; 2% discharged home, 2% discharged to a public facility with 24 hour observation. (figure 4)

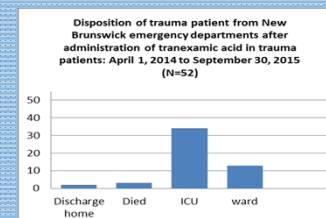


Figure 4: Disposition of trauma patient after receiving TXA

Based on the results there is a need to reinforce with healthcare professionals that the 3 hour window for TXA administration is calculated from time of injury and administration of the bolus dose should occur during the primary survey, followed by an infusion when indicated. Case level study would be required to comment further on TXA infusion post bolus in these cases.

Our study is not without limitations:

- Criteria for qualifying patients was at the discretion of the attending physician based on mechanism of injury, clinical suspicion and condition of the patient
- No guidelines to determine what patients should have received an infusion of TXA after the bolus dose
- This review only looked at patients who received TXA, not patients who may have qualified but did not receive TXA
- Infrequent healthcare provider exposure to major trauma may affect incorporation of TXA administration into routine practice
- No efficient method to measure awareness of physicians working in an emergency department about the recommendation for administration of TXA

Conclusion

A provincial trauma registry enables the review of evidence based critical interventions as part of a regular quality review. There are currently ongoing efforts in all level I, II, III and V designated trauma centres in NB to encourage TXA bolus and infusion within 3 hours of time of injury and early use upon ED arrival. Future studies are warranted to understand barriers to TXA infusion post TXA bolus.

1. The CRASH-2 Collaborators. Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial. *Lancet* 2010; 376: 23-32.



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