



SHORT COMMUNICATION

Tranexamic acid – A recipe for saving lives in traumatic bleeding

Ian Roberts

London School of Hygiene & Tropical Medicine, London, UK

Received 24 October 2011; accepted 25 November 2011
Available online 26 December 2011

KEYWORDS

Tranexamic acid;
Traumatic bleeding

Using kitchen scales, carefully weight out 4 kg of rice and pour it into a deep saucepan. Now put your hands into the rice and let the grains run between your fingers. Contemplate carefully each grain. The number of grains (about 140,000) is approximately the number of lives that could be saved each year world-wide if all hospitalized trauma patients with significant bleeding were treated with tranexamic acid (TXA) within 3 h of injury. TXA is cheap and widely available. All that is needed to reap these human benefits is that doctors use it.

That TXA is a potent inhibitor of fibrinolysis which was first reported by Okamoto and Okamoto in *The Keio Journal of Medicine* in September 1962.¹ Since then TXA has been widely used to treat heavy menstrual bleeding and to reduce

blood loss in elective surgery where it reduces blood transfusion by about one-third.² The CRASH-2 collaborators hypothesized that TXA might also reduce bleeding in trauma patients. The CRASH-2 trial was a UK government funded randomized trial of the effects of the early administration of TXA on death, vascular occlusive events and blood transfusion in bleeding trauma patients.

A total of 20,211 adults with significant traumatic bleeding were randomized to receive TXA or matching placebo, with 99.6% follow-up. The risk of death due to bleeding was significantly reduced with TXA. If TXA is given within 3 h of injury, it reduces the risk of bleeding to death by nearly one-third (relative risk = 0.72 [95%CI 0.63–0.83], $p < 0.001$). All cause mortality was also significantly reduced.^{3,4} The large numbers of patients studied in a wide range of different health care settings help these results to be generalized widely. On the basis of the results of the CRASH-2 trial, TXA has been included in the WHO list of essential medicines.⁵ Giving TXA to bleeding trauma patients within 3 h of the injury could save over 100,000 lives per year world-wide. Giving TXA to bleeding trauma patients is highly cost effective in high, middle and low income countries.⁶ It is essential that all doctors who treat trauma patients are aware of the results of the CRASH-2 trial.

TXA should be given to all adults with significant haemorrhage (SBP < 90, HR > 110) or those considered by the clinician to be at risk for significant haemorrhage. Because the

E-mail addresses: ian.roberts@Lshtm.ac.uk, collette.barrow@Lshtm.ac.uk

2090-5068 © 2011 Alexandria University Faculty of Medicine.
Production and hosting by Elsevier B.V. All rights reserved.

Peer review under responsibility of Alexandria University Faculty of Medicine.

doi:10.1016/j.ajme.2011.11.006



Production and hosting by Elsevier

effect of tranexamic acid on death due to bleeding depends importantly on the time interval between the injury and the onset of treatment it should be given as early as possible and within 3 or 4 h of the injury as it is unlikely to be effective if given later than this.

References

1. Okamoto S, Okamoto U. Amino-methyl-cyclohexane-carbolic acid: AMCHA. A new potent inhibitor of fibrinolysis. *Keio J Med* 1962;**11**:105–15.
2. Henry DA, Carless PA, Moxey AJ, et al. Anti-fibrinolytic use for minimising perioperative allogeneic blood transfusion. *Cochrane Database Syst Rev* 2007;**4**:CD001886.
3. 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 randomized, placebo-controlled trial. *Lancet* 2010;**376**:23–32.
4. The CRASH-2 Collaborators. The importance of early treatment with tranexamic acid in bleeding trauma patients: an exploratory analysis of the CRASH-2 randomized controlled trial. *Lancet* 2011;**377**:1096–101.
5. <http://www.who.int/selection_medicines/committees/expert/18/en/index.html> .
6. Guerriero C, Cairns J, Perel P, Shakur H, Roberts I, et al. Cost-effectiveness analysis of administering tranexamic acid to bleeding trauma patients using evidence from the CRASH-2 trial. *PLoS ONE* 2011;**6**(5):e18987. [doi:10.1371/journal.pone.0018987](https://doi.org/10.1371/journal.pone.0018987).