Clinical Guideline

Subject: Use of Tranexamic Acid (TXA) for pediatric trauma patients with uncontrolled hemorrhage

Purpose: To provide guidelines for the use of TXA for pediatric trauma patients with uncontrolled hemorrhage.

Responsibility: Physicians, Physician Assistants, Nurse Practitioners, Registered Nurses (RN), Pharmacist

Definition: TXA is a lysine analogue that binds to the lysine-binding site on plasminogen, preventing the formation of plasmin, leading to decreased fibrinolysis and blunting of the inflammatory response that is thought to contribute to the development of MODS (multiple organ dysfunction syndrome) secondary to hemorrhagic shock.

Background: No evidenced based guidelines are available for the use of TXA in pediatric trauma patients. Evidence is available in pediatric operative literature and adult trauma literature. Bleeding trauma patients are at high risk for mortality (35% of deaths were attributed to bleeding in the CRASH-2 study with a 5% mortality overall). Children in general have healthier vasculature than adults, so there is no clear reason for a lower age limit.

Indications for use: Any pediatric trauma patient (no lower age limit) receiving massive transfusion, uncontrolled vascular bleeding, and those that are hemodynamically unstable with active internal bleeding (e.g. liver, spleen and/or renal lacerations).

No Indication for use: Non-bleeding patients would not benefit from TXA. Patients with crush injury or patients receiving TXA beyond the acute phase may have a higher risk for disseminated intravascular clotting (DIC). Use of recombinant factor VIIa (rFVIIa) in combination with TXA compounds the risks of DIC and should be avoided.

Contraindications: Patients with known thrombophilia.

I. Guidelines
   a. Give 20 mg/kg bolus over 10 minutes (maximum of 1000 mg) followed by the same dose (20mg/kg, maximum of 1000 mg) infused over 8 hours. May continue if significant ongoing bleeding is observed beyond eight hours but not to exceed 24 hours.
   b. The first dose optimally should be given within three hours of injury.
   c. If a dedicated intravenous access for an infusion is not available, a repeat of the 20 mg/kg (maximum 1000 mg) bolus dose could be given after 3 hours instead of the 8 hour
infusion. May continue to give every 8 hours if significant ongoing bleeding is observed but not to exceed 24 hours.

d. The infusion and boluses should be discontinued once bleeding is controlled.

Clinical guidelines have the potential to improve health outcomes and reduce costs. However, what is best care for the majority of patients, as recommended in the guideline, may be inappropriate for the individual patient. Physicians must continue to use good clinical judgment when deciding when to follow the guideline. (Woolf SH, Grol R, Hutchinson A, Eccles M, Grimshaw J. Clinical guidelines: Potential benefits, limitations, and harms of clinical guidelines. BMJ. February 20, 1999; 318(7182):527-530.)

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References: