

Commentary

Randomized Controlled Trials of Traumatic Coagulopathy

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Description

Trauma is a leading cause of death worldwide. Injury-limiting resuscitation or balanced transfusion of plasma, platelets, and red blood cells to treat post-traumatic bleeding has become the standard of care. A balanced ratio of red blood cells to plasma and platelets is associated with improved mortality and has become the standard of care for resuscitation. There is a dose-dependent relationship between transfused product units and infections. Liquid and lyophilized plasma are alternatives to fresh frozen plasma, can be administered immediately, and can improve clotting parameters more rapidly, but higher-quality studies are needed. Despite balanced blood transfusions, trauma-induced coagulopathy can occur, and prothrombin complex concentrate and cryoprecipitate administration may play a role in prevention. In addition to conditions, viscoelastic guidance is increasingly used to customize component transfusions. Alternatively, whole blood can be used. This has become the standard of military practice and is gaining popularity in the civilian environment.

Trauma-induced coagulopathy is associated with very high mortality. We recently showed that early aggressive infusion of fresh frozen plasma to correct coagulopathy can improve survival. However, fresh frozen plasma is a perishable product, making it impractical for use in demanding environments such as the battlefield. The development of shelf-stable, easy-to-handle, and small-volume freeze-dried lyophilized plasma can overcome logistical limitations. We report on the development and testing of such products.

Traumatic coagulopathy has been intensively studied for over a century and is associated with high morbidity and mortality. Traumatic coagulopathy score to distinguish between trauma-related bleeding and chronic bleeding due to Traumatic coagulopathy. We hypothesized that clinical Trauma-Induced Coagulopathy Traumatic coagulopathy scores correlated with laboratory measures of coagulation, transfusion need, and mortality.

Randomized controlled trials of optimal administration of fresh frozen plasma for persistent major traumatic bleeding have been difficult to conduct and have not been published. Coagulopathy remains a common event during resuscitation after major trauma, and hemorrhage remains the leading cause of traumatic death, suggesting that current clotting factor replacement practices may be inadequate.

A pharmacokinetic model was used to simulate the diluent component of coagulopathy during bleeding and to compare different fresh plasma transfusion strategies for prevention and/or correction of diluent coagulopathy. Derivation of hematocrit and plasma clotting factor concentrations over time based on blood loss and replacement rates, transfusion hematocrit and clotting factor concentrations, and hematocrit and plasma clotting factor concentrations, assuming volume replacement and loss rates are approximately equal. This led to a fundamental change in the initial care of critically injured patients. Despite major advances, hemorrhage remains one of the leading causes of premature death in trauma patients. Recent studies have reported that most severely injured patients have coagulopathy on admission prior to CPR and traditionally have massive coagulopathy. Blood transfusion practice grossly underestimates the need. The hypothesis of this study is that pre-intensive care unit massive transfusion protocols do not adequately correct coagulopathy and that early uncorrected coagulopathy predicts mortality.

A clinically defined Traumatic coagulopathy score obtained in the reflected the requirement for massive transfusion and mortality in severely injured trauma patients, and also correlated with abnormal coagulation assays.

Acknowledgement

None.

Conflict of Interest

The authors declare no competing interest.