Research - R171

Poster

Abstract Title:

The Massive Transfusion Protocol (MTP) and Clinical Outcomes at Two Level 1 Trauma Centers

Authors:

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Background & Purpose:

Exsanguination in trauma patient presents a difficult challenge for all trauma centers. The ability to rapidly obtain and transfuse blood products is paramount to survival. This requires efficient and timely coordination between multiple services and departments. Monitoring of the MTP and multidisciplinary departmental meetings were required in order to improve this process. Our hypothesis was that a 1:1 ratio of packed red blood cells (PRBC) to fresh frozen plasma (FFP) and a clearly defined multidisciplinary process to obtain and transport blood products, increases patient survival.

Study/Project Design:

Retrospective observational study.

Setting:

Multi-institution, Academic, Level 1 trauma accredited, rural and urban hospital.

Sample:

All trauma patients who received the MTP and had at least 10 units of PRBCs administered from January 1, 2009 to June 30, 2013.

Procedures:

Beginning in 2009 we retrospectively collected multiple data points for every trauma patient who received the MTP. Examples of the data points included: mechanism of injury (blunt/penetrating), age, injury severity score (ISS), units of PRBC and FFP administered, PRBC to FFP ratio, hospital length of stay (HLOS), clinical complications, discharge status (live/die), and destination. The process to obtain blood products for the two hospitals was similar with the goal of a 1:1 ratio of PRBC to FFP, and concurrently monitored. Results were reviewed at multidisciplinary meetings and revisions to the MTP process were implemented and evaluated. Examples of the revisions included: allocation of additional blood bank resources, establishment of transport services, communication between the trauma service and the bloodbank after each MTP, and recording all telephone calls to the bloodbank.

Findings/Results:

Descriptive statistics indicated significant differences between the two hospitals in injury type (blunt/penetrating), age, race, ISS, units of PRBC and FFP administered, initial systolic blood pressure (SBP), international normalized ratio (INR), hemoglobin and lactic acid levels ($p < .0001$). Both hospitals utilized a similar formalized policy for the administration of the MTP with a goal of a 1:1 ratio of PRBC to FFP. Univariate and multivariate regression for survivors identified the PRBC: FFP ratio group of .75 – 1.49 to be significantly associated with the higher odds of survival (both p values <.005) versus the ratio group of 1.50 and above. The raw and adjusted odds ratio of survival for the .75 – 1.49 group versus the 1.50 and above group, was 3.12 and 3.07 respectfully. No variable had a significantly different effect on survival between the two hospitals.

Discussion/Conclusions/Implications:

A 1:1 ratio of PRBC to FFP increases survival for trauma patients who received the MTP. The experience of two level 1 trauma hospitals providing trauma care to two vastly different patient populations demonstrated improved clinical outcomes with the MTP. A structured, formal policy for the administration of the MTP, concurrently monitored, is essential to ensure positive patient outcomes. Future study is warranted through the inclusion of additional level 1 and 2 trauma centers and to validate our results.