THE EFFECT OF EVOLVING FLUID RESUSCITATION ON THE OUTCOME OF SEVERELY INJURED PATIENTS: AN 8-YEAR EXPERIENCE AT A TERTIARY TRAUMA CENTER

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ABSTRACT

Background and Aims: Fluid resuscitation of severely injured patients has shifted over the last decade toward less crystalloids and more blood products. Helsinki University trauma center implemented the massive transfusion protocol in the end of 2009. The aim of the study was to review the changes in fluid resuscitation and its influence on outcome of severely injured patients with hemodynamic compromise treated at the single tertiary trauma center.

Material and Methods: Data on severely injured patients (New Injury Severity Score > 15) from Helsinki University Hospital trauma center’s trauma registry was reviewed over 2006–2013. The isolated head-injury patients, patients without hemodynamic compromise on admission (systolic blood pressure > 90 or base excess > –5.0), and those transferred in from another hospital were excluded. The primary outcome measure was 30-day in-hospital mortality. The study period was divided into three phases: 2006–2008 (pre-protocol, 146 patients), 2009–2010 (the implementation of massive transfusion protocol, 85 patients), and 2011–2013 (post massive transfusion protocol, 121 patients). Expected mortality was calculated using the Revised Injury Severity Classification score II. The Standardized Mortality Ratio, as well as the amounts of crystalloids, colloids, and blood products (red blood cells, fresh frozen plasma, platelets) administered prehospital and in the emergency room were compared.

Results: Of the 354 patients that were included, Standardized Mortality Ratio values decreased (indicating better survival) during the study period from 0.97 (pre-protocol), 0.87 (the implementation of massive transfusion protocol), to 0.79 (post massive transfusion protocol). The amount of crystalloids used in the emergency room decreased from 3870 mL (pre-protocol), 2390 mL (the implementation of massive transfusion protocol), to 2340 mL (post massive transfusion protocol). In these patients, the blood products’ (red blood cells, fresh frozen plasma, and platelets together) relation to crystalloids increased from 0.36, 0.70, to 0.74, respectively, in three phases.