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Study Title

D Alloimmunization bY Trauma? Or Not at All (DAYTONA)

Study Description

There is emerging evidence from both the military and civilian literature showing that the early transfusion of blood products during a trauma resuscitation improves survival.1,2 In particular, the combination of red blood cells (RBC) and plasma was shown to be the most beneficial compared to either component alone or crystalloids in a secondary analysis of a randomized trial of injured civilians.3 Thus, it is expected that the use of blood products in the pre-hospital and the early in-hospital phases of the resuscitation will increase. When blood is administered in these phases, the patient's ABO and RhD-type is unlikely to be known; in these cases, group O RBCs or LTOWB are selected as this group will be compatible with the recipient's naturally occurring anti-A and/or -B. Ideally, RhD-negative RBCs or LTOWB would be provided to females of childbearing potential (FCP), commonly defined as between ages 13-50, if her RhD-type is negative or unknown because if she becomes sensitized to the RhD antigen, future pregnancies could be affected by hemolytic disease of the fetus and newborn (HDFN) although many of the alloimmunization events that were associated with severe HDFN were attributed to a previous pregnancy.4 This caution also applies especially to female children. While RhD-alloimmunization is of minimal clinical significance for males and females who are beyond childbearing potential, the concern about alloimmunization and HDFN in FCPs depends in part on the rate of RhD-alloimmunization. This alloimmunization rate has been evaluated in several previous studies of trauma, surgery, and/or general hospitalized patients and has been found to range between approximately 11-50% (Table 1).5-14 However, there is significant heterogeneity in the design of these retrospective studies, including the nature of the patients studied and the method by which the alloimmunization rate was calculated. In particular, none of the previous studies have focused on injured patients in the childbearing years and instead studied patients who were, on the whole, over 50 years old, and who were not necessarily injured. In addition, the RhD-alloimmunization rate in children is unknown as it is uncommon to provide RhD+ RBC/LTOWB to children whose RhD-type is unknown.
Furthermore, the question of whether a D- patient who has received at least one RhD+ RBC or LTOWB unit should be switched back to D- products to reduce their risk of alloimmunization or maintained on D+ units because they have already been exposed was studied in a small trial that is now in press in Transfusion. In this study, the rate of RhD-alloimmunization amongst 335 D- hospitalized patients between 13-50 years of age who received at least one D+ RBC or LTOWB unit was evaluated based on the number of RhD+ units that they received. A significant trend towards increased alloimmunization based on the dose of RhD+ units transfused was not detected Perhaps one explanation was the relatively small number of patients per RhD+ unit quantum. Thus, greater confidence in this result would be obtained from repeating the analysis

with more patients.

Study Status

Completed

Publication Number

147, 154

Teams

CTS

Study Leaders

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