

ACS COT Residents Trauma Papers Competition Title Page

Principal Author's Information

Name and degree(s): Mohamad Chehab, MD

**Title of the Abstract: Whole Blood Hemostatic Resuscitation in Pediatric Trauma:
A Nationwide Propensity-Matched Analysis**

Institution: The University of Arizona

Preferred Mailing Address: redacted

Preferred Phone Number: redacted

Email Address: redacted

Whole Blood Hemostatic Resuscitation in Pediatric Trauma: A Nationwide Propensity-Matched Analysis

Introduction

The use of whole blood (WB) in resuscitating pediatric trauma patients has emerged following its promising role in adults. Although transfusing WB in children has been shown to be feasible and safe, its effectiveness remains to be explored. The aim of this study is to examine the outcomes of WB use as an adjunct to component therapy (CT) compared to CT only as early resuscitation for pediatric trauma patients.

Methods

Children aged 1-17 years who required transfusion within 4 hours of presentation were identified in the Trauma Quality Improvement Program 2017. Patients were stratified into those receiving WB+CT vs. CT alone. Propensity-score matching in a 1:2 ratio was performed based on patient demographics, injury characteristics, hemorrhage control interventions, and trauma center level. Primary outcome measures were transfusion requirements. Secondary outcome measures were mortality, hospital length of stay (LOS), and major complications.

Results

A total of 135 children receiving WB+CT were matched to 270 patients receiving CT only. **(Figure 1)** Mean age was 12±5 years, 66% were male, and median ISS was 32 [20-43]. A total of 51% of patients were in shock, 34% had penetrating injuries, and 41% required surgical intervention for hemorrhage control. Total blood products transfused were significantly decreased in children receiving WB, both at 4 hours (35 [22-73] vs. 48 [33-95] mL/kg; $p=0.013$) and 24 hours (39 [24-97] vs. 53 [36-119] mL/kg; $p<0.001$). **(Table 1)** Rates of 24-hour mortality (19.3 vs. 21.9%; $p=0.546$) and in-hospital mortality (31.1 vs. 34.4%; $p=0.502$) were not different. Similarly, no difference in hospital LOS (11 [8-16] vs. 12 [7-18] days; $p=0.191$) and rates of AKI (3.7 vs. 4.4%; $p=0.726$), ARDS (8.1 vs. 11.5%; $p=0.300$), VTE (6.7 vs. 8.1%; $p=0.597$), and sepsis (1.5 vs. 3.0%; $p=0.365$) was found.

Conclusion

Utilizing WB as an adjunct to CT was associated with decreased transfusion requirements in pediatric trauma patients. No differences in clinical outcomes such as mortality, hospital LOS, and major complications were discernible. With growing interest and increased utility of WB in trauma centers across the US, high-quality evidence is warranted to further support the incorporation of WB in transfusion protocols of pediatric trauma patients.

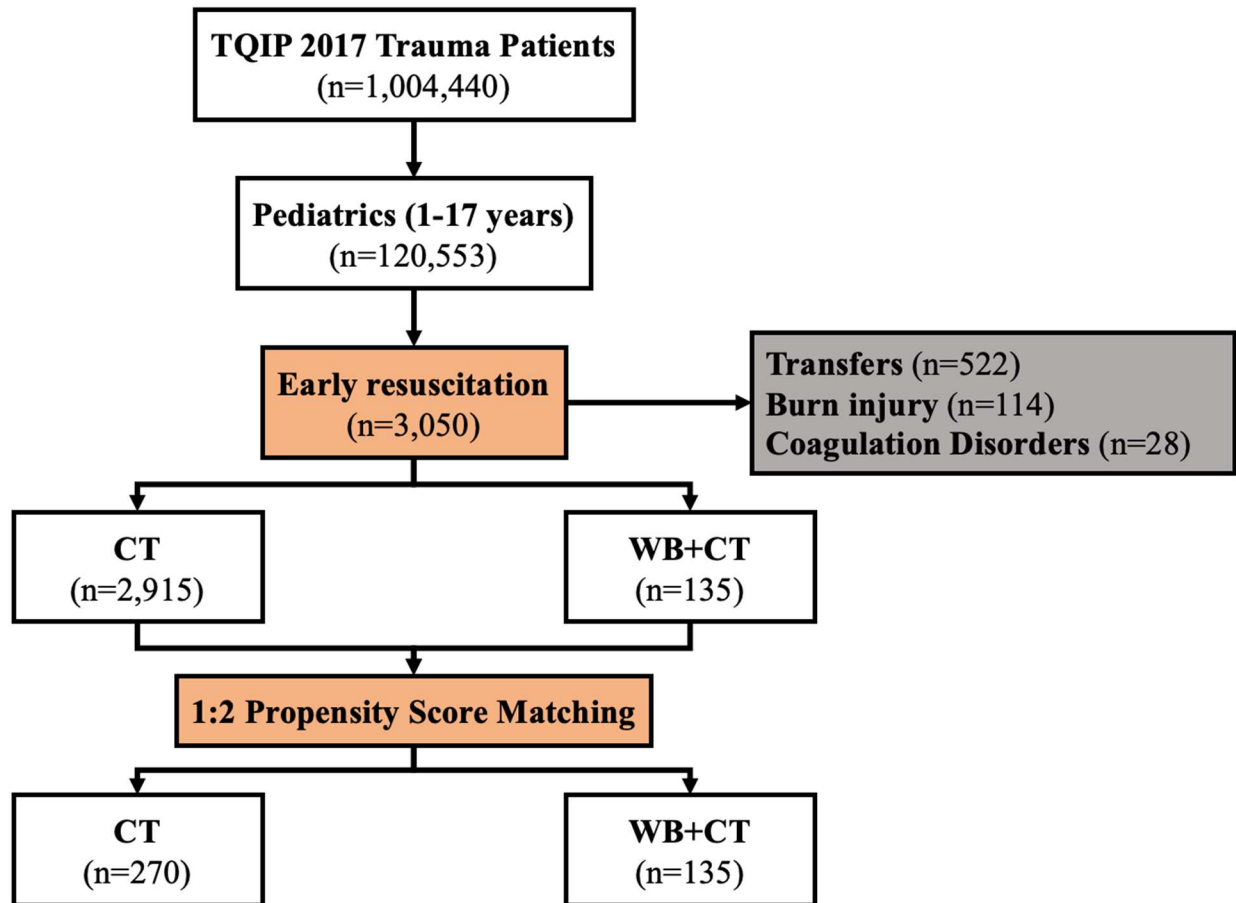


Figure 1: Patient flow diagram

Table 1: Transfusion requirements

	CT (n=270)	WB+CT (n=135)	p-value
4-hour transfusions, mL/kg, median [IQR]			
PRBC	31 [22-57]	19 [11-31]	0.008*
Plasma	12 [9-31]	9 [0-21]	<0.001*
Platelets	4 [4-10]	0 [0-6]	<0.001*
WB	-	13 [9-20]	-
Total blood products	48 [33-95]	35 [22-73]	0.013*
24-hour transfusions, mL/kg, median [IQR]			
PRBC	36 [25-71]	22 [15-53]	<0.001*
Plasma	17 [11-46]	11 [0-25]	<0.001*
Platelets	6 [4-13]	0 [0-9]	<0.001*
WB	-	14 [10-23]	-
Total blood products	53 [36-119]	39 [24-97]	<0.001*

CT=Component therapy; WB=Whole blood; IQR=Interquartile range; PRBC=Packed red blood cells; *=Statistically significant