

A HIGH RATIO OF PLASMA & PLATELETS TO PACKED RED BLOOD CELLS IN THE FIRST SIX HOURS OF MASSIVE TRANSFUSION IMPROVES OUTCOMES IN A LARGE MULTI-CENTER STUDY

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Introduction: Recent studies have shown high ratios of fresh frozen plasma (FFP) to packed red blood cells (PRBC) during the first 24 hours improves survival in massive transfusions. Most hemorrhagic deaths occur within the first 6 hours. Our aim was to determine the effect of high ratios of FFP & platelets (PLT) to PRBC in the first 6 hours.

Methods: Records of 466 massive transfusion trauma patients (≥ 10 units PRBC), at 16 Level 1 trauma centers were reviewed. Transfusion ratios in the first 6 hours were correlated with outcome.

Results: All groups had similar ISS, GCS, mechanism of injury, and age. Higher 6 hour ratios of FFP:PRBC and PLT:PRBC lead to improved six hour and in-hospital mortality (see below). Initial $\geq 1:1$ ratios of FFP:PRBC resulted in decreased overall PRBC transfusion from 22.3 to 15.6 units ($p < 0.001$), and $\geq 1:1$ ratios of PLT:PRBC decreased overall PRBC transfusion 22.1 to 17.9 units ($p < 0.01$). Patients with $\geq 1:1$ ratio of PLT:PRBC had more ventilator free days (6.8 vs 4.4, $p < 0.001$).

Conclusion: Early administration of high ratios of FFP and platelets improves survival, decreases overall PRBC need, and decreases ventilator time in massively transfused patients. The biggest difference in mortality occurs during the first 6 hours after admission, suggesting that early administration of FFP and platelets is critical. Several trauma centers now have thawed plasma available, which speeds early product delivery. Prospective studies should strive for early administration of plasma and platelets.

Ratio	Measure	<1:4*	1:4-1:1*	$\geq 1:1^*$	p	*6 hour ratio
FFP:PRBC	6 hour mortality	37.3%	15.2%	2.0%	<0.001	
FFP:PRBC	In-hospital mortality	54.9%	41.1%	25.5%	=0.002	
PLT:PRBC	6 hour mortality	22.8%	19.0%	3.2%	<0.001	
PLT:PRBC	In-hospital mortality	43.7%	46.8%	27.4%	=0.03	