Plasma Transfusion in Obstetric Hemorrhage: A Single-Center Quality Audit of Dosing Practices and Outcomes

Nisha Panigrahy, BSc Lynn Squires, MD FRCPC Joshua Nicholas, MD FRCPC Kelly Fedoruk, MD FRCPC

Background

Postpartum hemorrhage (PPH) is the leading cause of maternal mortality worldwide.[1]

Obstetric transfusion protocols stem from trauma literature, suggesting a 1:1:1 blood product ratio.[2] Appropriate plasma dosage is 10-15 ml/kg, which is ≥3 units for most adults.[3-8]

Physiological changes in pregnancy increase fibrinogen and create a hypercoagulable state, highlighting the risks of under-dosing plasma.

While audits of plasma transfusion in medical and surgical patients have been reported, audits in the obstetric population are lacking.

Aim

We sought to determine the proportion of obstetric patients who received appropriate dosing of plasma (≥ 2U) at our center.

Secondary aims were to compare plasma:RBC ratios, fibrinogen concentrate administration, coagulation test parameter changes (including INR and fibrinogen levels), and clinical outcomes between groups based on plasma dosing adequacy.

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Methods

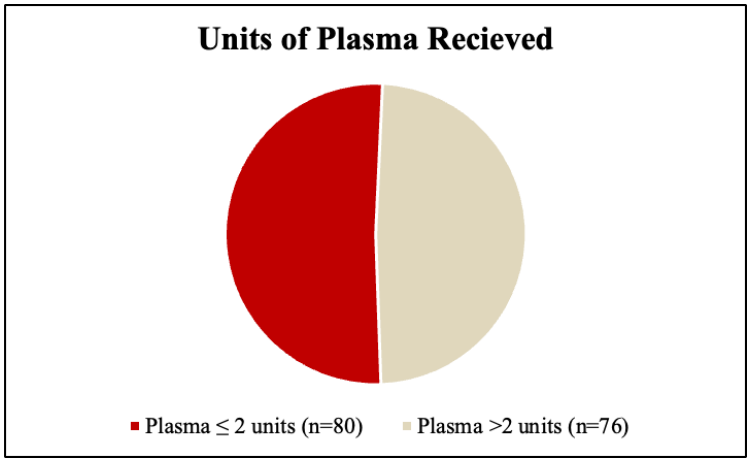
We audited 156 electronic medical records of obstetric patients who received plasma transfusions in Labor and Delivery from January 1, 2019 to December 31, 2023.

We included obstetric patients who received at least one unit of plasma, along with demographic, intraoperative, and transfusion data within a 24-hour period.

We recorded INR, TEG, and fibrinogen levels pre and post plasma transfusion.

We grouped patients into those receiving > 2U vs. ≤ 2U plasma and compared outcomes.

Results



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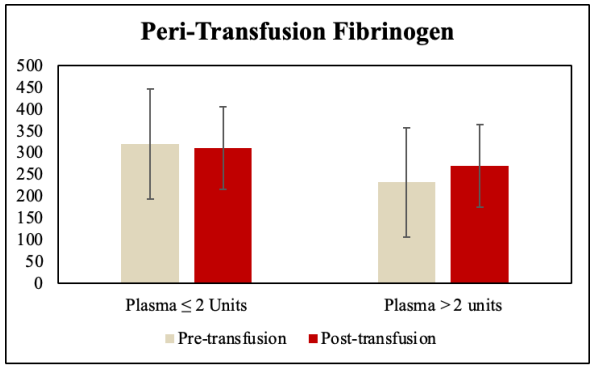

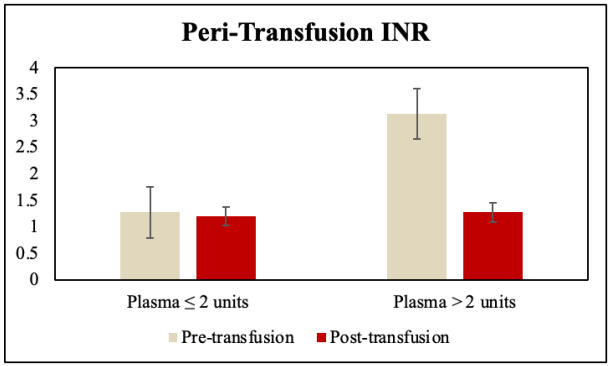

Transfusion Parameters (mean)	Plasma ≤ 2 units (n=80)	Plasma >2 units (n=76)
Plasma (U)	2	4
Platelets (U)	0	1
Fibrinogen (g)	0	2
RBC:Plasma ratio	2	1.4

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Conclusions

- Over 50% of patients at our center who were transfused plasma received an inadequate dose. This represents a major quality improvement opportunity, to encourage appropriate dosage of plasma during resuscitation, and to avoid it's transfusion outside the setting of massive hemorrhage and/or coagulopathy.
- Our secondary analysiss revealed that the inadequate dosing of plasma led to lower levels of post-transfusion fibrinogen and minimal change in INR, further suggesting that receiving ≤ 2 units of plasma will not result in clinically meaningful change and put patients at unnecessary risk of transfusion.

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