

ORIGINAL ARTICLE

Obstetric Features of Large-Volume Red Blood Cell Transfusions in Parturients with Postpartum Hemorrhage: a Cross-Sectional Study

Huimin Deng ^{1,*}, Yuanshan Lu ^{1,*}, Yanlin Du ⁵, Xiao Wang ³, Yiran Li ⁶, Zehua Dong ¹, Meiting Li ¹, Lan Hu ¹, Xiaofei Yuan ⁴, Fengcheng Xu ¹, Rong Xia ², Shaoheng Chen ^{1,2}

* Huimin Deng and Yuanshan Lu contributed equally to this work

¹ Department of Blood Transfusion, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

² Department of Transfusion Medicine, Huashan Hospital, Fudan University, Shanghai, China

³ Department of Obstetrics and Gynecology, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

⁴ Department of Pediatrics, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

⁵ Department of Clinical Pharmacy, the Second Affiliated Hospital of Dalian Medical University, Dalian, Liaoning, China

⁶ Department of Medical Affairs, Shanghai General Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

SUMMARY

Background: Packed red blood cell (pRBC) transfusion is a common therapeutic intervention for the treatment of postpartum hemorrhage (PPH). This study aimed to describe obstetric characteristics related to large-volume pRBC transfusions in pregnant women with PPH and evaluate the effect of blood conservation strategies and maternal outcomes.

Methods: This retrospective study included all parturients who received pRBC transfusions from 2016 - 2022 at a class A tertiary general hospital. Large-volume pRBC transfusions were defined as the receipt of ≥ 4 pRBC units during the postpartum period (within 24 hours). Numerous prenatal factors related to previous pregnancy/labor/abortion, pregnancy complications, or antenatal laboratory indicators, as well as blood conservation strategies and maternal outcomes, were identified and compared.

Results: Out of the 305 (305/24,997; 1.2%) women who received pRBC transfusions, 156 (51.1%) received ≥ 4 pRBC units during the postpartum period (within 24 hours). Women with large-volume pRBC transfusions had a greater prevalence of previous cesarean delivery (40.4%) and abortion (63.5%) than those who received 1 - 3 pRBC units (22.8% and 52.3%, respectively), as well as parturients with a history of placenta previa/accreta, placental adhesion, and cesarean delivery. In addition, those who received ≥ 4 pRBC units had greater incidences of thrombocytopenia and hypofibrinogenemia than those who received 1 - 3 pRBC units. In addition, parturients who received more pRBCs tended to receive more positive blood protection measures, including uterine balloon tamponade, embolization, and tranexamic acid administration, as well as having a longer length of hospitalization and more prolonged ICU stays.

Conclusions: In this study, more than half of the parturients received ≥ 4 pRBC units during the postpartum period. Further studies that focus on identifying high-risk pregnant women in prenatal settings could enable enrollment in a blood conservation program, therefore minimizing allogeneic blood transfusion (ABT)-related risks. (Clin. Lab. 2025;71:1-2. DOI: 10.7754/Clin.Lab.2025.241249)

Correspondence:

Shaoheng Chen
Department of Blood Transfusion
Shanghai General Hospital
Shanghai Jiao Tong University School of Medicine
3th Floor, No. 12 Building, 100# Haining Road
Shanghai 200080
China
Phone: + 8621 36126361
Email: chenshaoheng@sjtu.edu.cn

Rong Xia
Department of Transfusion Medicine
Huashan Hospital
Fudan University
12 Urumqi Middle Road
Shanghai 200040
China
Email: rongxia@fudan.edu.cn

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Supplementary Data

Table S1. Patient pregnancy characteristics by transfusion volume.

Variables	Total	Transfusion of 1 - 3 units RBC	Transfusion of ≥ 4 units RBC	p-value
Age (years), mean (SD)	31.0 (28.0 - 34.0)	30.5 (5.4)	31.4 (4.6)	0.105
Age > 35 years, n (%)	67 (22.0)	30 (20.1)	37 (23.7)	0.450
BMI (kg.m ⁻²), mean (SD)	26.7 (24.9 - 29.0)	27.4 (3.3)	26.7 (3.3)	0.085
Past medical history				
IVF, n (%)	42 (13.8)	17 (11.4)	25 (16.0)	0.242
Current pregnancy				
Singleton pregnancy, n (%)	266 (87.2)	129 (86.6)	137 (87.8)	0.745
Multifetal pregnancy, n (%)	39 (12.8)	20 (13.4)	19 (12.2)	0.745
Placental disorders				
Placental abruption, n (%)	9 (3.0)	4 (2.7)	5 (3.2)	<u>0.788</u>
Uterine fibroids, n (%)	14 (4.6)	5 (3.4)	9 (5.8)	0.314
Complications during this pregnancy				
Current pregnancy-induced hypertension/ pre-eclampsia, n (%)	36 (11.8)	15 (10.1)	21 (13.5)	0.358
Gestational diabetes mellitus, n (%)	70 (23.0)	37 (24.8)	33 (21.2)	0.445

BMI - body mass index, IVF - in vitro fertilization.

Table S2. Comparison of obstetric variables across groups.

Variables	Total	Transfusion of 1 - 3 units RBC	Transfusion of ≥ 4 units RBC	p-value
Antenatal laboratory indicators				
Hemoglobin (g/dL), median (Q1 - Q3)	98.0 (82.0 - 109.0)	98 (81.5-108.5)	97 (82.0 - 109.75)	0.948
Hemoglobin (< 110 g/dL), n (%)	232 (76.1)	115 (77.2)	117 (75)	0.655
Hematocrit (%), median (Q1 - Q3)	29.0 (25.0 - 32.3)	29.0 (24.7 - 32.1)	29.0 (25.0 - 32.4)	0.911
Thrombocytopenia (< 100 × 10 ⁹ /L), n (%)	34 (11.1)	9 (6.0)	25 (16.0)	<u>0.006</u>
Fibrinogen (< 2.0 g/L), n (%)	19 (6.2)	3 (2)	16 (10.3)	<u>0.003</u>
INR, median (Q1 - Q3)	1.0 (0.9 - 1.0)	1.0 (0.9 - 1.0)	1.0 (1.0 - 1.1)	0.053
Mode of delivery				
Normal vaginal, n (%)	107 (35.1)	60 (40.3)	47 (30.1)	0.064
Instrumental vaginal, n (%)	19 (6.2)	11 (7.4)	8 (5.1)	0.415
Cesarean, n (%)	179 (58.7)	78 (52.3)	101 (64.7)	<u>0.028</u>
Degree of PPH				
Serious PPH (> 1,500 mL), n (%)	69 (22.6)	11 (7.4)	58 (37.2)	<u>≤ 0.001</u>

INR - international normalized ratio, PPH - postpartum hemorrhage.