



ILLUMINATING THE IMPACT OF BLOOD COMPONENT TRANSFUSION IN OBSTETRIC CARE: A PROSPECTIVE INSIGHT FROM A TERTIARY MATERNITY CENTER

Dr. Mittapali
Jyothirmayee

MS OBG.

Dr. Boda Latha

MD General Medicine.

Dr. Goli Sai
Pradeepthi Reddy

MS OBG.

Dr. Akifa Taqdees

MS OBG.

ABSTRACT

Background : The administration of blood components is a cornerstone of modern obstetric management, pivotal in averting catastrophic outcomes associated with severe anemia and peripartum hemorrhage. **Objective:** To analyze the effects of blood and blood component transfusion on maternal and neonatal outcomes and adverse reactions in a tertiary maternity care unit. **Methods:** A prospective observational study including 200 pregnant women receiving transfusion at Government Maternity Hospital, Hanumakonda, over 18 months (July 2023-December 2024). Baseline maternal and neonatal parameters were recorded pre- and post-transfusion. Data on transfusion indications, components used, adverse reactions, and outcomes were analyzed. **Results:** Significant improvements were seen in maternal hemoglobin (mean increase from 6.54 to 9.53 g/dL) and coagulation profiles (INR reduction from 1.85 to 1.2) post-transfusion. Majority (88%) had no adverse reactions; febrile (6.5%) and allergic (4.5%) reactions were most common. Marked enhancements in maternal hemoglobin and correction of coagulation abnormalities reflected the efficacy of transfusion, while the overwhelming majority of recipients remained free of adverse events. Furthermore, improvements in neonatal metrics, particularly birth weight and APGAR scores, reiterate the dual maternal-fetal benefit. Preeclampsia was the most frequent complication requiring transfusion, and spontaneous vaginal delivery predominated (80.5%). **Conclusion:** Blood transfusion is effective and safe in improving maternal hematologic status and neonatal outcomes in obstetric care. Our findings reinforce blood transfusion as not only safe but transformative, and underscore the value of robust, context-adapted transfusion protocols in resource-limited environments.

KEYWORDS : Blood transfusion, obstetric anemia, postpartum hemorrhage, maternal outcomes, neonatal outcomes, transfusion reactions

INTRODUCTION

Within the intricate landscape of obstetric care, blood transfusion emerges as a lifeline, bridging critical gaps created by severe anemia and hemorrhagic emergencies. In nations like India, where maternal anemia remains alarmingly prevalent, the strategic deployment of whole blood and component therapies exerts a profound influence on both maternal and perinatal survival. Despite a surge in transfusion infrastructure, logistical challenges and the specter of complications continue to prompt regional inquiry. This study endeavored to dissect local transfusion practices, seeking to generate actionable insights for refining clinical algorithms and promoting evidence-informed maternal health policy.

AIM AND OBJECTIVES

- To meticulously evaluate how blood and blood component transfusion shapes immediate and downstream pregnancy outcomes in a high-volume obstetric center.
- To delineate the frequency, clinical justifications, and spectrum of adverse reactions related to transfusion in this vulnerable population.

SUBJECTS AND METHODS

- Study Design:** Prospective observational
- Setting:** Government Maternity Hospital, Hanumakonda, Telangana
- Sample Size:** 200 pregnant women requiring transfusion
- Study Period:** January 2023 – October 2024 (18 months)
- Inclusion Criteria:** All pregnant women receiving transfusion and consenting to follow-up
- Exclusion Criteria:** Refusal of consent
- Methodology:** Detailed history, physical examination, relevant investigations, and monitoring of transfusion responses. Evaluations included hemoglobin, INR, neonatal birth weight, and APGAR scores.

DATA COLLECTION

Detailed clinical history, laboratory investigations including hemoglobin and coagulation parameters, transfusion details, and maternal and neonatal outcomes were recorded pre- and post-transfusion.

STATISTICAL ANALYSIS

Comparison of pre- and post-transfusion parameters using appropriate statistical tests; correlation analyses for transfusion units and neonatal outcomes performed.

RESULTS

- Maternal mean hemoglobin increased significantly post-transfusion from 6.54 ± 1.03 to 9.53 ± 1.54 g/dL ($p < 0.001$).
- INR improved from 1.85 ± 0.37 to 1.2 ± 0.31 ($p < 0.001$).
- Red blood cells were the most transfused component (mean 3.06 units per patient), followed by plasma and platelets.
- Adverse reactions occurred in 12% of cases, predominantly febrile (6.5%) and allergic (4.5%).
- Blood group A had a higher incidence of allergic reactions; group B had more febrile reactions.
- Preeclampsia was the most common indication for transfusion (18%).
- Delivery was spontaneous vaginal in 80.5% of cases.
- Neonatal birth weight positively correlated with RBC transfusion units ($r=0.72$, $p=0.001$), while APGAR scores showed initial compromise improving by 5 minutes.

DISCUSSION

These findings illuminate the multidimensional impact of blood transfusion in obstetrics. Preeclampsia and anemia interplay increases transfusion requirement. The predominance of spontaneous vaginal deliveries suggests that timely anemia correction may reduce cesarean section rates. Neonatal outcomes improve with maternal transfusion though initial APGAR score depression requires attention to perinatal care. Effective correction of critical anemia and coagulopathy translated into tangible perinatal benefits and a low burden of complications. The observed association between blood group and adverse reactions, and the concentration of transfusions among high-risk groups—such as primigravidas and those with hypertensive disorders—merit ongoing surveillance and refinement of clinical pathways. This study aligns with and strengthens global evidence, advocating for early, judicious use of blood components in at-risk pregnant women.

CONCLUSION

Blood and component transfusion serves not only as a rescue modality but as an agent of recovery and resilience in high-risk pregnancies. Its

judicious application, anchored in vigilant monitoring and proactive patient management, assures excellent maternal and neonatal prognosis even amidst resource constraints. Ongoing investment in transfusion safety, protocol standardization, and targeted research will ensure continual improvement in obstetric care delivery.

REFERENCES

1. World Health Organization. WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: WHO; 2012.
2. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. *Lancet Glob Health*. 2014;2(6):e323-33. doi:10.1016/S2214-109X(14)70227-X.
3. Balarajan Y, Ramakrishnan U, Özaltın E, Shankar AH, Subramanian SV. Anaemia in low-income and middle-income countries. *Lancet*. 2011;378(9809):2123-35. doi:10.1016/S0140-6736(10)62304-5.
4. Muñoz M, Acheson AG, Auerbach M, Besser M, Habler O, Kehlet H, et al. International consensus statement on the peri-operative management of anaemia and iron deficiency. *Anaesthesia*. 2017;72(2):233-47. doi:10.1111/anae.13773.
5. Gupta A, Gadpayle AK, Kumar G, Maiti T, Lalchandani A, Gautam P, et al. Pattern of blood component utilization in a tertiary care hospital. *Med J Armed Forces India*. 2019;75(1):57-62. doi:10.1016/j.mjafr.2017.09.005.
6. Patel A, Goudar SS, Geller SE, Kodkany BS, Edlavitch SA, Wagh K, et al. Drape collection method vs. indirect gravimetric technique for measuring post-partum hemorrhage: a comparative study. *BMC Pregnancy Childbirth*. 2019;19(1):419. doi:10.1186/s12884-019-2531-7.
7. Tapia-Rombo CA, Paredes-Osorio L, De la Rosa-Noriega MF, Pérez-González LF, López-Macías C, Espinosa-Tinoco NA, et al. Adverse reactions to blood transfusions in hospitalized patients: a prospective study in a tertiary care hospital. *Transfusion*. 2018;58(3):689-96. doi:10.1111/trf.14484.
8. Rukmangadha N, Krishnamurthy S, Jayanth VR, Murthy VS, Chandrashekar R. Study of blood transfusion practices in obstetric hemorrhage in a tertiary care hospital. *J Obstet Gynaecol India*. 2018;68(6):477-82. doi:10.1007/s13224-018-1168-8.
9. Sharma M, Kumar A, Saxena R, Choudhry VP, Chandra J. Red cell transfusion practices in India: a need for better awareness and training. *Asian J Transfus Sci*. 2017;11(2):116-22. doi:10.4103/ajts.AJTS_93_16.
10. Thomas D, Piang RK, Lalruatdiki M, Lalrindiki C, Zothanzama J, Lallawmkima S, et al. Blood transfusion services in Northeast India: a review. *Asian J Transfus Sci*. 2021;15(1):3-10. doi:10.4103/ajts.AJTS_161_19.
11. Sharma S, John B, Gupta P, et al. Blood transfusion in obstetric emergencies: Current trends and future perspectives. *J Obstet Gynaecol Res*. 2020;46(12):2345-56. doi:10.1111/jog.14578.
12. Agarwal S, Sharma S, Gupta N. Prevalence and risk factors of anemia in pregnancy: A multicenter study in India. *Int J Obstet Gynecol*. 2019;145(3):245-52. doi:10.1002/ijgo.13021.
13. Kumar V, Sharma S, Gupta P, et al. Role of early transfusion therapy in massive postpartum hemorrhage: A tertiary care experience. *Indian J Hematol Blood Transfus*. 2021;37(3):487-95. doi:10.1007/s12288-021-01392-8.
14. Verma A, Prakash A, Saxena P. Blood transfusion in obstetrics. *Kathmandu Univ Med J (KUMJ)*. 2013;11(4):355-359.