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Original Research Article

Caesarean section-related blood transfusion: risk factors in a private teaching hospital in Nigeria

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ABSTRACT

Background: Comprehensive emergency obstetric care, which includes the life-saving procedure of blood transfusion, is one of the essential components of effective emergency obstetric care that leads to a reduction in maternal mortality. In this study, blood transfusion risk factors were found in patients who had Caesarean deliveries at our facility.

Methods: This was a retrospective study of all pregnant women who had caesarean section at Babcock University Teaching Hospital, Nigeria between 2016 and 2020. Their medical records were retrieved and reviewed using pro-forma. Chi square analysis was used to determine significant association between blood transfusion status and independent variables. Information was extracted from medical records using pro-forma.

Results: Of 1568 obstetric admissions, there were 1210 deliveries and 369 (30.5%) caesarean sections. Ninety-five women (25.7%) of those that had caesarean sections were transfused. The incidence of blood transfusion was 13.7%. The preoperative packed cell volume, age and caesarean delivery type were significantly associated with blood transfusion status ($p < 0.05$).

Conclusions: Preoperative anemia, age and caesarean delivery type were all associated with blood transfusion status. To maximize hemoglobin levels at delivery and to identify high-risk patients, regular antenatal checkups should be given more importance.

Keywords: Blood transfusion, Caesarean delivery, Risk factors

INTRODUCTION

Obstetric hemorrhage continues to be one of the main causes of morbidity and mortality in women who are of reproductive age.¹ In developing countries, blood transfusions are most frequently required due to obstetric complications.² Blood transfusions are a crucial part of patient care in obstetrics and gynecology. The blood transfusion facility is the major center of this branch of medicine.³ Obstetric hemorrhage and severe anemia are two of the most common indications, and it continues to save the lives of millions of women each year as an adjunct to good obstetric care.⁴ Inadequate management of obstetric emergencies involving a critical need for

blood can make them worse.⁵ Obstetric hemorrhage is the leading cause of maternal mortality in the developing world, accounting for 127,000 maternal deaths globally each year.^{6,7} Both before and after delivery, obstetric hemorrhages can occur, but postpartum hemorrhages account for more than 80% of cases and 25% of the estimated 3,58,000 maternal deaths each year.⁸ Another frequent factor contributing to women's blood transfusion needs is anemia. Anemia, which has a prevalence of 14% in developed countries and 51% in developing countries, is one of the most common nutritional deficiencies that affect pregnant women.⁹ A prevalence of 25%-30% was observed in Ibadan.^{10,11} Anemia, which can negatively affect neonatal outcomes and perinatal mortality, is a known risk factor for intrauterine growth abnormality.¹⁰

In the field of obstetrics, blood transfusions are frequently required for a variety of ailments, such as bleeding in the first trimester (abortion, ectopic, and molar pregnancy), antepartum hemorrhage, postpartum hemorrhage, severe anemia, PIH, thrombocytopenia, and DIC. Nevertheless, there are limitations to prevention, necessitating blood transfusion. By preventing and treating anemia and implementing measures that will minimize blood loss during delivery, the need for transfusion can be reduced. Blood transfusions should be carried out when the advantages are most likely to outweigh the risks.¹² The availability of blood and blood products for transfusion continues to be a major problem in countries with limited resources like Nigeria. Restrictions on blood donation and banking, as well as financial and religious considerations, have all been linked to blood transfusion delays.¹³ At Babcock University Teaching Hospital in Nigeria, a study was conducted to identify the risk factors for blood transfusion in patients who had Caesarean deliveries.

METHODS

The Babcock University teaching hospital, located in Ilishan Remo, served as the site of this retrospective cross-sectional study. All women who underwent

caesarean sections (CS) were eligible to participate; however, the convenience sampling method was used to identify a total of 968 pregnant women who underwent CS. Participant written informed consent was obtained. Data were gathered for four years (2016-2022). The patient's blood transfusion status, or whether or not blood was transfused, served as the dependent variable. The participating anesthetists decided which participants needed blood transfusions. The independent variables were the preoperative packed cell volume (hematocrit level), caesarean delivery type, and anesthesia type.

Statistical analysis

Data collected were analyzed using the Statistical Package for the Social Sciences for Windows version 26 (SPSS Inc., Chicago, IL, USA). Results were presented with descriptive statistics and Chi-square test was used to determine the association between blood transfusion status and the independent variables.

RESULTS

A total of 1255 deliveries occurred during the study period of which 693 had caesarean section and 95 patients were transfused.

Table 1: Association between independent variables and risk of blood transfusion (n=693).

Characteristics	All patients N (%)	Received blood N (%)	No blood N (%)	P value
Age (years)				
<25	94 (13.6)	4 (0.6)	90 (13.0)	0.02
25-30	260 (37.5)	34 (4.9)	226 (32.6)	
31-35	210 (30.3)	28 (4.0)	182 (26.3)	
36-40	106 (15.3)	26 (3.8)	80 (11.5)	
>40	23 (3.3)	3 (0.4)	20 (2.9)	
Mean age (\pm SD)	31.27 \pm 5.18	35.51 \pm 4.86	29.04 \pm 3.65	
Caesarean delivery type				
Elective LSCS	287 (41.4)	54 (7.8)	233 (33.6)	0.000
Emergency LSCS	406 (58.6)	41 (5.9)	365 (52.7)	
Anesthesia type				
Subarachnoid block	613 (88.5)	80 (11.5)	533 (76.9)	0.168
General	80 (11.5)	15 (2.2)	65 (9.4)	
Co-morbidity/other diseases				
Nil	646 (93.2)	115 (16.6)	531 (76.6)	0.698
Asthma	6 (0.9)	0 (0.0)	4 (0.6)	
Eclampsia	3 (0.4)	0 (0.0)	1 (0.1)	
HBSS	3 (0.4)	0 (0.0)	1 (0.1)	
HTN	15 (2.2)	0 (0.0)	4 (0.6)	
PIH	5 (0.7)	0 (0.0)	3 (0.4)	
PUD	10 (1.4)	0 (0.0)	8 (1.2)	
RVD	5 (0.7)	0 (0.0)	3 (0.4)	
Preoperative PCV				
<26	98 (10.2)	12 (1.2)	86 (8.9)	0.048
>26	595 (61.8)	120 (12.5)	475 (49.3)	

LSCS, Lower segment cesarean section; DPE, HBSS; Sickle cell anemia; HTN, Hypertension; PIH, Pregnancy induced hypertension; PUD, Peptic ulcer disease; RVD, Retroviral disease

Thus, caesarean section rate was 55.5% and the blood transfusion rate was 13.7% among women who had caesarean delivery. The commonest age group among study patients was 25-30 years (37.5%) with the mean age of 21.27 years. According to (Table 1), majority of the patients had emergency LSCS (58.6%) while 41.4% had elective LSCS. Concerning caesarean delivery type, 7.8% and 5.9% of those who had elective and emergency LSCS were transfused respectively. About 6 (0.9) patients each had asthma, 15 (2.2) had systemic hypertension while 10 (1.4) patients had peptic ulcer disease. Only 5 (0.7) patients had HIV infection. About 98 (10.2%) had PCV less than 26% preoperatively, out of which only 12 (1.2%) were transfused (Table 1). The result of the Chi square analysis revealed that age, caesarean delivery type and preoperative PCV were significantly associated with blood transfusion status ($p < 0.05$).

DISCUSSION

Pregnancy is a physiological condition, but in some circumstances, if left untreated, it has the potential to quickly and unexpectedly become pathological. Acute blood loss can occur in the first half of pregnancy as a result of complications like abortions, ruptured ectopic pregnancies, and molar pregnancies. Obstetric hemorrhage is the second most common cause of transfusions, after anemia, and one of the major causes of maternal morbidity and mortality. The objectives of intraoperative blood transfusion include correcting blood loss, providing erythrocytes, increasing blood oxygen-carrying capacity, enhancing microcirculation, supplementing blood colloidal components and blood coagulation factors, and maintaining regular coagulation functions. Patients between the ages of 25 and 30 received the majority of transfusions (13.7%). Some studies, however, found a lower transfusion rate. In their study, 5.9% of the women who received transfusions were between the ages of 21 and 30, according to Chawla.¹⁴ A much lower transfusion rate of 2.9% and 2.27 percent, respectively, was reported in studies from Finland and Australia.^{15,16} Similar to this, the overall transfusion rate was 12.1% lower in a study of blood transfusion in obstetric practice at Lagos University Teaching Hospital (LUTH), Lagos, compared to the 20.8% in another study.^{6,17} The rate of blood transfusion in another study by Akinola et al was 12.5%, which is significantly higher than the rate in this study. Additionally, we discovered that patients with elective CS had a higher transfusion rate.¹⁸ This result agreed with the outcomes of the other studies.¹⁹⁻²¹ Possible reasons for this include frequent reasons for elective surgery, including prior caesarean sections, placenta previa, abnormal lying, and multiple pregnancies, all of which are potential risk factors for excessive intraoperative delivery. When compared to studies from south-west Nigeria, the United States, and Sub-Saharan Africa, this study's caesarean section rate of 55.5% is high. However, according to the World Health Organization, any facility

should have a caesarean section rate of between 5 and 15%.^{17,21-23} High caesarean delivery rates have been a concern globally, despite the fact that the majority of cases in this study were genuine emergency surgeries. The chi square analysis revealed significant correlations between age, caesarean type, and preoperative PCV and blood transfusion status ($p = 0.05$). Preoperative anemia and age were independent factors for blood transfusion, according to Akinlusi et al (OR=12.15, 95% CI=4.02-36.71, $p = 0.001$).¹⁷ This was predicted since an anemic woman will often be less able to tolerate blood loss and may develop cardiovascular impairment owing to hemodynamic instability. In a group of Nigerian women, prenatal care has been shown to have a favourable effect on hematocrit values.²⁴ With this kind of treatment, prenatal issues might be identified and labor and delivery could be organized to achieve certain goals. One of the study's advantages is that it was designed retrospectively. Despite the fact that this study was limited to a single institution due to the facility's unique geographic location and high patient volume, the results may have regional importance.

CONCLUSION

Blood transfusion was shown to be substantially correlated with preoperative PCV, age, and caesarean type. In order to effectively manage obstetric hemorrhage, it is crucial to recognize the prenatal hemorrhage risk factors and prepare for bleeding.

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REFERENCES

1. Committee on Practice Bulletins Obstetrics. Postpartum hemorrhage. *Obstet Gynecol.* 2017;130: e168-86.
2. Schantz-Dunn J, Nour NM. The use of blood in obstetrics and gynecology in the developing World. *Rev Obstet Gynecol.* 2011;4(2):86-91.
3. Anjali K, Varsha K, Sulabha J, Anuja B, Bhavana K, Savita S. Blood transfusion in obstetrics and gynaecology: a retrospective analysis. *Panacea J Med Sci.* 2015;5(3):109-12
4. Jou HJ, Hung HW, Yan YH. Risk factors for blood transfusion in singleton pregnancy deliveries in Taiwan. *Int J Gynaecol Obstet.* 2012;117(2):124-7.
5. Pavord S, Myers B, Robinson S. UK guidelines on the management of iron deficiency in pregnancy. *Br J Haematol.* 2012;156(5):588-600.
6. Owonikoko KM, Adeoye A, Adeyemi AS, et al. Assessment of blood transfusion practices at caesarean section in a teaching hospital in south-western nigeria. *Int J Med Pharma Sci.* 2014;4(6):69-76.

7. Matsunaga S, Seki H, Ono Y. A retrospective analysis of transfusion management for obstetric hemorrhage in a Japanese obstetric center. *Obstet Gynecol.* 2012;2012:854064.
8. McLintock C, James AH. Obstetric hemorrhage. *J Thromb Haemost.* 2011;9:1441-51.
9. Suryanarayana R, Chandrappa M, Santhuram AN, Prathima S, Sheela SR. Prospective study on prevalence of anemia of pregnant women and its outcome: a community-based study. *J Family Med Prim Care.* 2017;6(4):739-43.
10. Aimakhu CO, Olayemi O. Maternal haematocrit and pregnancy outcome in Nigerian women. *West Afr J Med.* 2003;22:18-21.
11. Adesina O, Akinyemi O, Oladokun A. Anemia in pregnancy at two levels of health care in Ibadan, South West Nigeria. *Ann Afr Med.* 2011;10(4):272-7.
13. The clinical use of blood, Blood transfusion safety. Available at: http://www.who.int/bloodsafety/BTS_ResolutionsAdopted.pdf. Accessed on 20 November 2021.
14. Jadon A, Bagai R. Blood transfusion practices in obstetric anaesthesia. *Indian J Anaesth.* 2014;58(5):629-36.
15. Chawla S, Bal MH, Vardhan BS, Jose CT, Sahoo I. Blood transfusion practices in obstetrics: our experience. *J Obstet Gynaecol India.* 2018;68(3):204-7.
16. Patterson JA, Roberts CL, Bowen JR, et al. Blood transfusion during pregnancy, birth and the postnatal period. *Obstet Gynecol.* 2014;123(1):126-33
17. Patel VP, Patel RV, Shah PT, et al. Study of role of blood transfusion in obstetric emergencies. *Int J Reprod Contracept Obstet Gynecol.* 2014;3(4):1002-5.
18. Akinlusi FM, Rabiou KA, Durojaiye IA, Adewunmi AA, Ottun TA, Oshodi YA. Caesarean delivery-related blood transfusion: correlates in a tertiary hospital in Southwest Nigeria. *BMC Preg Childbirth.* 2018;18:24.
19. Akinola OI, Fabamwo AO, Tayo AO, Rabiou KA, Oshodi YA, Onyekwere CA. Evaluation of blood reservation and use for caesarean sections in a tertiary maternity unit in south western Nigeria. *BMC Preg Childbirth.* 2010;10:23-9.
20. Owonikoko KM, Adeoye A, Adeyemi AS. Assessment of blood transfusion practices at caesarean section in a teaching hospital in south-western Nigeria. *Int J Med Pharma Sci.* 2014;4(6):69-76.
21. Menacker F, Declercq E, Macdorman MF. Caesarean delivery: background, trends, and epidemiology. *Semin Perinatol.* 2006;30(5):235-41.
22. Enohumah KO, Imarengiaye CO. Factors associated with anaesthesia-related maternal mortality in a tertiary hospital in Nigeria. *Acta Anaesthesiol Scand.* 2006;50(2):206-10.
23. Martin JA, Hamilton BE, Ventura SJ. Births: Final data for 2009. Available at: <https://stacks.cdc.gov/view/cdc/>. Accessed on 20 November 2021.
24. Shah A, Fawole B, M'Imunya MJ, Amokrane F, Nafiu I, Wolomby JJ, et al. Caesarean delivery outcomes from the World Health Organisation global survey on maternal and perinatal health in Africa. *Int J Obstet Gynaecol.* 2009;107:191-7.
25. Chalmers B, Mangiaterra V, Porter R. World Health Organisation principles of perinatal care: the essential antenatal, perinatal and postpartum care course. *Birth.* 2001;28:202-7
26. Ogunbode O. Anaemia in pregnancy. *Trop J Obstet Gynaecol.* 1995;12:19-25.

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