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Management of Postpartum Haemorrhage: A study on Transfusion of Blood and its components

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Introduction: Blood Transfusion is identified as one of the essential components of comprehensive emergency obstetric care which has drastically reduced maternal mortality**. Material and Methods:** This is a prospective study conducted at NC Medical College and Hospital, in the Department of OBGY. (Tertiary care center) from January 2019 – September 2020. All patients requiring intrapartum transfusion of blood or blood products are enrolled in the study. No exclusion criteria. **Results:** In the present study, various age groups of patients were enrolled. Maximum transfusion (77.8%) rates are seen in the age group of 21-30 years and the minimum no. of patients were ranges from 31-40 years (8.4%). **Conclusion:** Postpartum hemorrhage, placental causes, and anemia are the commonest causes of the need for transfusion in obstetric practice.

Keywords: Blood transfusion, Postpartum hemorrhage, Blood components, Fresh frozen plasma/packed red blood cell

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Introduction

Maternal mortality is recognized as an important global health problem with obstetric hemorrhage being the leading cause in developing countries [1]. Blood transfusion is identified as one of the essential components of comprehensive emergency obstetric care which has drastically reduced maternal mortality [2]. As per WHO estimates, over a thousand of all maternal deaths are directly due to obstetric hemorrhage.

It accounts for 24% of or an estimated 127,000 maternal deaths annually [3]. The reported percentage of massive and life-threatening obstetric hemorrhage near around 3%–5% and 0.1% of deliveries, respectively. It has been reported that 0.3%–1% required blood component transfusion [4,5].

Several factors should be considered while assessing the risk of massive hemorrhage in the pregnant patient. The challenges faced are difficulty in assessing blood loss, physiological changes in pregnancy, and underlying obstetric condition. Increases in red cell mass and a disproportionately greater increase in plasma volume help the patient to tolerate severe blood loss and remain hemodynamically stable. The physiology of hemostasis in pregnancy is unique.

The coagulation system is enhanced, and the fibrinolytic system is inhibited in the late stages of pregnancy. Thus, a hypercoagulable state prevails in pregnancy. Hence, any massive hemorrhage in pregnancy can induce consumptive loss of coagulation factors, which can cause further hemorrhage leading to a vicious cycle resulting in disseminated intravascular coagulation (DIC) [6].

The detection of hypovolemia and thus the decision to transfuse early in obstetric hemorrhage is delayed by the inability to evaluate the accurate blood loss and the high-level tolerance of pregnant female to massive hemorrhage [7].

Understanding the uniqueness of obstetric hemorrhage is required for appropriate blood component support, which can effectively improve its pathophysiological condition, reduce the risk of DIC, and avoid the aggravation of hemorrhagic shock [8]. Thus, a complete evaluation of not only blood loss but also the underlying obstetric risk factor, patient's medical condition, age, vital signs, and blood; biochemical parameters are required to determine whether a transfusion is necessary [9].

This study has been reviewed blood transfusion patterns in patients with obstetric hemorrhage in our tertiary care center and analyzed the obstetric indications and risk factors for transfusion. The ratio of components transfused was also analyzed.

Aim

Analysis of intrapartum blood and blood products transfusion in the tertiary care center.

Objectives

- To study the incidence of intrapartum blood transfusion.

- To study the causes of blood transfusion.

- To study complications of blood transfusion

Material and Methods

Study Design: This is a prospective and observational study.

Study Place: Conducted at NC Medical College and Hospital, in the Department of OBGY (Tertiary care center).

Duration: One year and nine months (From January 2019 – September 2020).

Inclusion criteria: All patients requiring intrapartum transfusion of blood or blood products are enrolled in the study.

Exclusion Criteria: No exclusion criteria

Data Collection: Collected from patient's case sheet from Department of OBGY.

Statistical analysis: Data compiled in an Excel sheet and analyzed with the help of SPSS 20th version.

Result

In the present study, various age groups of patients were enrolled. Maximum transfusion (77.8%) rates are seen in the age group of 21-30 years and the minimum no. of patients were ranges from 31-40 years (8.4%) in Table 1.

Table-1: Distribution of age group.

Age	No. of Patients (n=95)	Percentage (%)
<20	13	13.6
21-30	74	77.8
31-40	8	8.4

Table-2: Gravida score of patients.

Gravida	No. of Patients (n=95)	Percentage (%)
Primigravida	26	27.3
Multigravida	57	60.0
Grand Multigravida	11	11.5

In table 2, Multigravida is at more risk (60%) for requiring transfusion, and (11.5%) grand Multigravida are at least risk for requiring transfusion.

Table-3: Booking status of patients.

Booking Status	No. of Patients (n=95)	Percentage (%)
Booked	17	17.8
Irregular ANC visits	73	76.8
Not booked	5	5.2

In table 3, (76.8%) patients with irregular ANC visits are more prone to obstetric complications, because of lack of awareness of proper ANC care, and 5.2% least were not booked.

Table-4: Haemoglobin level of patients.

Hb (gm/dl)	No. of Patients (n=95)	Percentage (%)
Severe	3	3.1
Moderate (6.1 -8.9)	53	55.7
Mild (9- 10.9)	32	36.8
Normal	7	7.3

In table 4, more than half (55.7%) of the cases had anemia in the moderate range and 3.1% were severe.

Table-5: Indication of blood transfusion.

Complications	No. of Patients (n=95)	Percentage (%)
Atonic PPH	13	13.6
Traumatic PPH	11	11.5
Placental Abruption	10	10.52
Placenta Previa without Accreta/Percreta/Increta	7	7.3
Placenta Previa with Accreta/Percreta/Increta	2	2.1
HELLP Syndrome	7	7.3
Antecedent Anemia	39	41.0
Thrombocytopenia	6	6.3

In table 5, PPH is the commonest indication requiring blood transfusion followed by APH and PIH

Table-6: Mode of delivery.

Mode of Delivery	Total No. of Delivery	Transfusion Cases	Percentage (%)
Vaginal Delivery	928	42	4.52
Caesarean (elective)	357	13	3.64
Emergency cesarean	413	40	9.68

In table 6, emergency procedure 9. 68% are at more risk of requiring transfusion and 3.64% were cesarean section.

Table-7: Blood product transfused to the patients.

Blood Product Transfusion	No. of Patients	Percentage (%)
Packed Cell Transfusion	73	76.8
PCV + Blood Components (FFP + PRC/ Cryoprecipitate)	18	18.9
Only Platelets	4	4.2

In table 7, Most of the patients (76.8%) were in the moderate anemia range, only packed red cell transfusion sufficed the hemostatic requirement, and least (4.2%) percentage of patients required platelets.

Table-8: Maternal Mortality of the patients.

Causes	No. of Patients	Percentage (%)
DIC	2	2.10
Severe Anaemia	1	1.05

In table 8, mention the percentage of MMR, Inspite of receiving adequate blood transfusion MMR occurred due to causes like septicemia, AKI, DIC.

Discussion

The Ten Commandments for the transfusion practice in medicine state that transfusion should only be used when the benefits outweigh the risks and there are no appropriate alternatives, and laboratory tests should not be the sole deciding factor for transfusion [10]. The different components of the blood play different functions, and there is a need to realize that component therapy is the need for the present day. The blood component therapy should not be just started based on one investigation like Hb or platelet count, but the clinical profile of the patient, present condition, possibility of rebleed, etc., should also be the guiding factor. Each bag of packed RBCs has 150–200 ml RBCs and 75 ml plasma with a hematocrit of around 60%. These are indicated when insufficient RBCs in circulation or there is a decrease in the oxygen-carrying capacity of the blood. Dickason LA et al. in their study discouraged the practice of single-unit transfusion citing it as avoidable in the majority of the cases, and the risks involved in blood transfusion can cause more damage than benefit to the patient [11].

Platelets or fresh frozen plasma (FFP) is to be given as required. FFP is used in the correction of microvascular bleeding, multiple coagulation factor deficiencies, massive transfusion with coagulation abnormalities and platelet concentrates when the platelet counts fall below 20,000/ mm3. One unit of platelets increases the platelet count by 5000–7000/l. There is no role of prophylactic platelet transfusion; one needs to investigate and treat the cause. If the coagulation profile is not available, four units of FFP are given for four units of blood transfused within 24 hours [13,14].

The transfusion is a lifesaving procedure, but approximately 1% of all transfusions cause an immediate and delayed adverse reaction, despite the measures taken to reduce risks. Transmitted infections, hemolytic reactions, transfusion-associated acute lung injury (TRALI), hypocalcemia, hypomagnesemia, hyperkalemia, problems of massive transfusion such as hypothermia, metabolic acidosis, and abnormalities of coagulation should deter all of us from indiscriminate use of blood components [15,16].

Obstetric hemorrhage is the commonest cause of maternal death, causing one-fourth of maternal deaths yearly. (17) Massive and life-threatening obstetric hemorrhage occurs in 3–5% and 0.1% of deliveries, respectively, and blood product transfusion is required in 0.3–1% [18,19].

During pregnancy, the changes in the coagulation and the fibrinolytic system in form of enhancement and inhibition respectively occur, large-volume blood loss causes consumptive loss of coagulation factors, which causes more bleeding and starts a vicious cycle ending up with DIC [18,19]. These obstetric hemorrhages could be massive and may require replacement of one entire blood volume within 24 h or replacement of 50% of total blood volume (TBV) within 3 h, i.e., massive blood transfusion (MBT).

The setting of massive transfusion protocols (MTPs) describes the process of management of blood transfusion requirements in major bleeding episodes, assisting the interactions of the treating clinicians and the blood bank and ensuring judicious use of blood and blood components [21,22].

Increased capacity to tolerate bleeding due to physiological changes and often inaccurate estimation of blood loss in obstetrics may not show the change in their vital signs, resulting in a delay in the detection and treatment [23].

During the study period, the incidence of blood product transfusion for obstetric patients in our institution was 1.3% (32/2423), which was similar to previously reported studies: 0.3–1% by James in Europe and a Japanese center [24,25].

Patients who had blood product transfusion received two or more units of PRBCs, nine had received three PRBCs, and three patients had received four units of PRBCs, which is also similar to an earlier study by Iwamoto M et al. (26) Thirteen patients were transfused FFP, and as per the hospital protocol, those requiring both PRBCs and FFP were transfused in the ratio of 1:2, whereas a study by Bomken C recommended transfusion of PRBC and FFP at a ratio of 1:1.4. [27].

Anemia during pregnancy is a significant cause of maternal mortality and morbidity. The decision for transfusion was done in this study when the Hb\7 gm%, and there were\4 weeks for delivery or in labor. This trigger for transfusion of blood has been controversial, and the Cochrane review favors the restrictive transfusion policy for the safety of the patients. (28) Postpartum PRBC transfusion in the present study was only given if the patient was prone to bleeding due to some medical condition [29].

Limitation

The study was limited to a single center and was conducted in less number of patients only. It was recommended that more multi-center research work on this objective including more patients.

Conclusion

Placenta complications like placenta previa and postpartum hemorrhage are the major indications for blood transfusion was the obstetric practice.

What does the study add to the existing knowledge?

Counseling and prevention of anemia since adolescence can reduce the prevalence of anemia in women who become pregnant later. Early and regular antenatal care, early diagnosis of anemia and its management, early diagnosis and management of high-risk pregnancies and obstetric complications, institutional delivery, active management of the third stage of labor can reduce the rate of transfusion of blood and blood products.

Author's contribution

Dr. Fayaz Khan H: Study design, Literature survey, data analysis, paper writing.

Dr. Swati: Study design, paper writing, Literature survey.

Dr. Manju M: Paper writing, statistical part.

Reference

01. Karpati PC, Rossignol M, Pirot M, Cholley B, Vicaut E, Henry P, et al. High incidence of myocardial ischemia during postpartum hemorrhage. Anesthesiol. 2004;100(1)30-36. doi: 10.1097/00000542-200401000-00009 [Crossref]

02. Kalaivani K. Prevalence & consequences of anaemia in pregnancy. Indian J Med Res. 2009;130(5)627-633. doi: 10.18203/2320-1770.ijrcog20180155 [Crossref]

03. Bomken C, Mathai S, Biss T, Loughney A, Hanley J. Recombinant activated factor VII (rFVIIa) in the management of major obstetric haemorrhage- a case series and a proposed guideline for use. Obstet Gynecol Int. 2009;364843;1-8. doi: 10.1155/2009/364843 [Crossref]

04. Parker J, Thompson J, Stanworth S. A retrospective oneyear single-centre survey of obstetric red cell transfusions. Int J Obstet Anesth. 2009;18(4)309-313. doi: 10.1016/j.ijoa.2009.05.008 [Crossref]

05. Rainaldi MP, Tazzari PL, Scagliarini G, Borghi B, Conte R. Blood salvage during caesarean section. Br J Anaesth. 1998;80(2)195-198. doi: 10.1093/bja/80.2.195 [Crossref]

06. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin- Clinical Management Guidelines for Obstetrician-Gynecologists Number 76, October 2006- Postpartum hemorrhage. Obstet Gynecol. 2006;108(4)1039-1047. doi: 10.1097/00006250-200610000-00046 [Crossref]

07. Alfirevic Z, Elbourne D, Pavord S, Bolte A, Van Geijn H, Mercier F, et al. Use of recombinant activated factor VII in primary postpartum hemorrhage- the Northern European registry 2000-4. Obstet Gynecol. 2007;110(6)1270-8. doi: 10.1097/01.AOG.0000288515.48066.99 [Crossref]

08. McGehee RP, Dodson MK, Moore JL, Morrison FS et al. Effect of blood transfusion in patients with gynaecologic malignancy. Int J Obstet Gynecol. 1994;46(1)45-52. doi: 10.1016/0020-7292(94)90308-5 [Crossref]

09. Santoso JT, Saunders BA, Grosshart K. Massive blood loss and transfusion in obstetrics and gynecology. Obstet Gynecol Surv. 2005;60(1)827-37. doi: 10.1097/01.ogx.0000189154.98227.4b [Crossref]

10. Voak D. Guidelines for administration of blood products- transfusion of infants and neonates, British Committee for Standards in Haematology Task Force. Transfusion Med. 1994;4(1)63-69. doi: 10.1111/j.1365-3148.1994.tb00245.x [Crossref]

11. Dickason LA, Dinsmoor MJ. Red blood cell transfusion and caesarean section. Am Jobstet Gynecol. 1992;167(2)327-330. doi: 10.1016/s0002-9378(11)91409-4 [Crossref]

12. Saxena S, Rabinowitz AP, Johnson C, Shulman IA. Iron-deficiency anaemia- a medically treatable chronic anaemia as a model of tran sfusion overuse. Am J Med. 1993;94(2)120-4. doi: 10.1016/0002-9343(93)90172-l [Crossref]

13. Borghi B, van Oven H. Reducing the risk of allogeneic blood transfusion. CMAJ. 2002;166(3)332-334. [Crossref]

14. Adias TC, Jeremiah Z, Uko E, Osaro E. Autologous blood transfusion – A review. S Afr J Surg. 2006;44(3)114-116. doi: 10.1016/s0002-9378(11)91633-0 [Crossref]

15. Droste S, Sorensen T, Price T, Sayers M, Benedetti T, Easterling T, et al. Maternal and fetal hemodynamic effects of autologous blood donation during pregnancy. Am J Obstet Gynecol. 1992;167(1)89-93. doi: 10.1016/s0002-9378(11)91633-0 [Crossref]

16. Goodnough LT, Brecher ME, Kanter MH, AuBuchon JP. Transfusion medicine, First of two parts – Blood transfusion. N Engl J Med. 1999;340(6)438-447.
doi: 10.1056/NEJM199902113400606 [Crossref]

17. Yamada T, Mori H, Ueki M. Autologous blood transfusion in patients with placenta previa. Acta Obstet Gynecol Scand. 2005;84(3)255-259.
doi: 10.1111/j.0001-6349.2005.00698.x [Crossref]

18. Fuller AJ, Bucklin B. Blood component therapy in obstetrics. Obstet Gynecol Clin North Am. 2007;34(3)443-458.
doi:10.1016/j.ogc.2007.06.003 [Crossref]

19. Alfirevic Z, Elbourne D, Pavord S, Bolte A, Van Geijn H, Mercier F, et al. Use of recombinant activated factor VII in primary postpartum hemorrhage- the Northern European registry 2000-2004. Obstet Gynecol. 2007;110(6)1270-1278.
doi: 10.1097/01.AOG.0000288515.48066.99 [Crossref]

20. Charbit B, Mandelbrot L, Samain E, Baron G, Haddaoui B, Keita H, et al. PPH Study Group, The decrease of fibrinogen is an early predictor of the severity of postpartum hemorrhage. J Thromb Haemost. 2007;5(2)266–273.
doi: 10.1111/j.1538-7836.2007.02297.x [Crossref]

21. Koshy M, Burd L, Wallace D, Moawad A, Baron J. Prophylactic red cell transfusions in pregnant patients with sickle cell disease- A randomised cooperative study. N Engl J Med. 1988;319(22)1447-1452.
doi: 10.1056/nejm198812013192204 [Crossref]

22. Carless PA, Henry DA, Moxey AJ, O'connell DL, Brown T, Fergusson DA. Cell salvage for minimising perioperative allogeneic blood transfusion. Cochrane Database Syst Rev. 2006;18(4)CD001888.
doi: 10.1002/14651858.CD001888.pub2 [Crossref]

23. Clark V. Facilities for blood salvage (cell saver technique) must be available in every obstetric theatre. Int J Obstet Anesth. 2005;14(1)48-50.
doi: 10.1016/j.ijoa.2004.09.001 [Crossref]

24. Rebarber A, Lonser R, Jackson S, Copel JA, Sipes S. The safety of intraoperative autologous blood collection and autotransfusion during cesarean section. Am J Obstet Gynecol. 1998;179(3 pt 1)715-720.
doi: 10.1016/s0002-9378(98)70070-5 [Crossref]

25. Murphy MF, Wallington TB, Kelsey P, Boulton F, Bruce M, Cohen H, et al. British Committee for Standards in Haematology, Blood Transfusion Task Force, Guidelines for the clinical use of red cell transfusions. Br J Haematol. 2001;113(1)24-31.
doi: 10.1046/j.1365-2141.2001.02701.x. [Crossref]

26. Iwamoto M, Jernigan DB, Guasch A, Trepka MJ, Blackmore CG, Hellinger WC, et al. Transmission of West Nile virus from an organ donor to four transplant recipients. New Engl J Med. 2003;348(22)2196-203.
doi: 10.1056/NEJMoa022987 [Crossref]

27. Bomken C, Mathai S, Biss T, Loughney A, Hanley J. Recombinant activated factor VII (rFVIIa) in the management of major obstetric haemorrhage- a case series and a proposed guideline for use. Obstet Gynecol Int. 2009;364843.
doi: 10.1155/2009/364843 [Crossref]

28. Prendiville WJ, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour. Cochrane Database Syst Rev. 2000;(2)CD000007.
doi: 10.1002/14651858.CD000007 [Crossref]

29. Franchini M, Franchi M, Bergamini V, Montagnana M, Salvagno GL, Targher G, et al. The use of recombinant activated FVII in postpartum hemorrhage. Clin Obstet Gynecol. 2007;114(1)8-15.
doi: 10.1111/j.1471-0528.2006.01156.x [Crossref]