Section: Obstetrics and Gynaecology

Original Research Article

AN OBSERVATIONAL STUDY TO EVALUATE INDICATIONS OF BLOOD TRANSFUSION AND MATERNAL OUTCOME IN OBSTETRICS.

Salma Khatun[1], D Prasanna Laxmi[2]

[1]Assistant Professor, Department of Obstetrics and Gynaecology, Government Medical College, Sangareddy, Telangana, India.
[2]Associate Professor, Department of Obstetrics and Gynaecology, Government Maternity Hospital/ Osmania Medical College, Sultan Bazar, Hyderabad, India.

Received *: 05/10/2024*
Received in revised form *: 22/11/2024*
Accepted *: 06/12/2024*

Corresponding Author:
Dr. D Prasanna Laxmi,
Associate Professor, Department of Obstetrics and Gynaecology, Government Maternity Hospital/ Osmania Medical College, Sultan Bazar, Hyderabad, India.
Email: drprasannadevara@gmail.com

DOI: 10.70034/ijmedph.2024.4.169

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (4); 915-920

ABSTRACT

Background: Aims: The aim is to study the indications of blood transfusion and maternal outcome in obstetrics.

Material and Methods: It is a prospective, observational study with a duration of 12 months, conducted on 100 patients. Pregnant women and postnatal mothers of age group from 18 to 40 years, Incomplete miscarriage, Anaemia, Antepartum, haemorrhage, Postpartum haemorrhage, Ectopic pregnancy are included in study.

Results: The 21 to 30 years age group constituted the highest percentage among the study subjects. Primiparous and multiparous women constituted 30% and 70%, Lower-middle class patients were in majority (44%), followed by Lower class (40%) and least were upper middle class patients (16%). Majority of the study population belonged to Second Trimester (42%), followed by Third Trimester (40%) and First Trimester (15%). Pre-transfusion Hb and Post-transfusion Hb, majority (57% and 86%) of the patients were having Hb percentage between 7 to 9.9 gm% moderate anaemia was in high percentage (28%), targeting a haemoglobin level of more than 11 g/dL or complete resolution of anaemia may be preferred in those with an objection to blood products or at high risk for blood transfusions. Abruption cases were in high percentage (17%) and least is Placenta Previa (1%). Caesarean section rate in our study was 39%, Antenatal cases with six visits were 19%, followed by four visits 16% and five visits 16%. Emergency LSCS cases were in majority (26%), followed by undelivered ones (22%). 96% of cases requiring blood transfusion has no blood transfusion related complications but 7% of cases were observed with surgical site infection.

Conclusion: Adequate blood inventory always allays obstetrician's apprehension of blood availability. At the same time since in a country like India where demand is always more than supply.

Keywords: Caesarean Section(CS), Placenta Previa, Haemoglobin Level, Blood Transfusion.

INTRODUCTION

The most frequent reason for maternal death worldwide is Major Obstetric Hemorrhage (MOH). In obstetric management, blood transfusion therapy is the cornerstone. It saves bleeding victims as a failsafe component. Blood transfusions are one of the eight crucial elements of CEMOC (comprehensive Emergency Obstetric Care), which the World Health Organization (WHO) recognizes as being necessary to lower the maternal mortality rate (MMR). Extra blood loss during pregnancy and severe hemodynamic instability are caused by a variety of pregnancy problems and labour disorders that are present as risk factors. In the day-to-day practice of obstetrics, this appears as a condition requiring transfusion, coupled with problems caused by ruptured ectopic and abortion. In obstetrics, the blood transfusion rate ranges from 0.16 to 2-6%. Transfusion rates that vary from region to region,

from hospital to hospital, and from clinician to clinician. Women who experience unusual labour and births have higher rates. According to studies, surgical experts and junior doctors are more prone to transfuse patients than physicians and anesthesiologists.[1,2]

Blood transfusions in obstetrics have been used less frequently over time. The study papers in this sector have also supported the same. Various centers have shown a drop in transfusion rates despite an increase in the rate of surgical deliveries. Despite a decline in blood transfusion rates, obstetric outcomes have gotten better.[3,4] The common causes for the pregnancy associated cases requiring transfusion are,. Postpartum haemorrhage, Anaemia, Preeclampsia, 1st Trimester bleeding, Abruption placenta and HELLP syndrome. A few common risk factors lead to transfusion of blood and components during pregnancy and labour includes, Placental problems (previa, abruptio, accreta, retained placenta), Uterine overdistension (polyhydramnios, multiple gestation), Preeclampsia, DIC, Preterm labour, Augmentation of labour, Operative delivery-vaginal or abdominal. The use of whole blood versus component transfusions, single-versus multiple-unit transfusions, and clinical judgement versus Haemoglobin levels for transfusion are just a few of the controversial transfusion practices. resulting in different large transfusion methods and, therefore, diverse reports are observed as an outcome.[5,6] The present study has been taken up with an intent to study the indications of blood transfusion and maternal outcome in obstetrics.

MATERIALS AND METHODS

It is a prospective, observational study with a duration of 12 months, conducted on 100 patients at Government Maternity Hospital, Sultan bazar, Koti, Hyderabad.

The study population was Antenatal and Postnatal patients requiring blood transfusion. The patients were explained about the study, the procedure, and the complications, and the informed consent form was collected from all participating patients before the commencement of the study. The informed consent form was distributed before the commencement of the study. This study protocol was approved by the hospital medical ethics committee and ethical clearance was taken prior to the study from Government Maternity Hospital, Sultan Bazar, Koti, Hyderabad.

Inclusion Criteria: Pregnant women and postnatal mothers attending Government Maternity Hospital, Age group from 18 to 40 years, Incomplete miscarriage, Anaemia, Antepartum haemorrhage, Postpartum haemorrhage, Ectopic pregnancy.

Exclusion Criteria: Patients with any bleeding disorders diagnosed earlier, (Thalassemia, Sickle cell anaemia, Von Willi brand etc.).

Study procedure Careful history was taken from all the patients. Clinical and blood transfusion details were also obtained from the patients. General and obstetric examination was done to evaluate clinical condition of the patient. Patients were evaluated according to demographic characteristics, indication of blood transfusion, units of blood transfused, pre-transfusion and post-transfusion Hb level.

Statistical Analysis

The demographic data and clinical parameters obtained were subjected to descriptive statistical analysis and by using SPSS (version 20), the data is stated as Frequencies (n), and Percentages (%) in tabulated and graphs form.

RESULTS

In the present study, majority (78%) of the cases were in 21 to 30 years of age group. 70% multi gravida patients and 30% primi gravida patients were present. Lower middle socioeconomic class patients were 44%, followed by Lower class 40%, upper Middle class patients 16%. 76% cases were booked while unbooked cases were 24%. Majority of the cases were in Second Trimester (42%), followed by Third Trimester (40%) and First Trimester (15%), and least (3%) patients were delivered. Moderate anaemia was in high percentage (26%) as an indication for blood transfusion. The indication for blood transfusion were abruptio placenta 17%, and least was Placenta Previa (1%). [Table 1]

In the present study, the haemoglobin percentage of the cases was observed. It was observed that, in both Pre-transfusion Hb and Post- transfusion Hb, 57% and 86% of the patients were having Hb percentage between 7 to 9.9 gm%. [Table 2]

In the present study, the whole blood transfusion in Antenatal group was of 14% and in Postnatal group it was 6% for same 1 unit of blood. [Table 3]

In the present study, the number of PRBC transfusions in Antenatal group were 42% for 1-unit blood and 22% in postnatal group for same 1-unit blood. [Table 4]

In the present study, the number of FFP transfusions in Antenatal group were 2% for 2 units of blood and in Postnatal group it was 1% for 1, 2 and 3 units of blood, respectively. [Table 5]

In the present study, Antenatal cases with six visits were 19%, followed by four visits 16% and five visits 16%, respectively. Patients with two visits were 1% and eleven visits were 1%respectively. Mode of delivery parameter was assessed. It was observed that Emergency LSCS cases requiring blood transfusion were 26%, followed by undelivered ones 22% and 7% were Laparotomy. 6% of patients requiring blood transfusion were with comorbidity of non-severe pre-eclampsia ,2% of each with overt diabetes and gestational diabetes,1% with severe pre-eclampsia, 1% with chronic rheumatic disease were observed. [Table 6]

In the present study, 4% of patients were having past history of blood transfusion. 96% of cases were reported without any complications due to blood transfusion while 2% were with chills, 1% of each with fever and rash. [Table 7]

Table 1: Demographic distribution

Age in years	Frequency (n=100)	Percentage (%)
18 to 20 years	13	13%
21 to 30 years	78	78%
31 to 40 years	09	9%
Total	100	100%
Parity		
Primi gravida	30	30%
Multi gravida	70	70%
Socio-economic status		
Lower	40	40%
Lower-middle	44	44%
Upper Middle	16	16%
Booked/Unbooked		
Booked	76	76%
Unbooked	24	24%
Gestation age		
First Trimester	15	15%
Second Trimester	42	42%
Third Trimester	40	40%
Delivered	03	3%
Indications		
First Trimester bleeding Incomplete abortion Ruptured ectopic	 08 06	 8% 6%
Anaemia a. Moderate b. Severe	 26 25	 26% 25%
Abruption	17	17%
Post-partum haemorrhage (PPH)	03	3%
Placenta Previa	05	5%
Low lying Placenta	02	2%
Complete molar pregnancy	01	1%
HELLP syndrome	02	2%
Retained product of conception (RPOC)	03	3%
Placenta accreta	02	2%

Table 2: Haemoglobin (Hb%)

Haemoglobin (Hb%)	Pre-transfusion Hb%		Post-transfusion Hb%	
	Frequency (n=100)	Percentage (%)	Frequency (n=100)	Percentage (%)
<7 gm%	34	34%	01	1%
7 to 9.9 gm%	57	57%	86	86%
10 to 10.9 gm%	09	09%	13	13%
TOTAL	100	100%	100	100%

Table 3: Number of whole blood transfusion (Ante/Postnatal)

Number of whole blood transfusion	Antenatal		Post-natal	
	Frequency (n=100)	Percentage (%)	Frequency (n=100)	Percentage (%)
1 unit	14	14%	06	06%
2 units	1	1%	Nil	0%
3 units	Nil	0%	1	1%
4 units	Nil	0%	Nil	0%
5 units	Nil	0%	02	2%

Table 4: Number of PRBC (Ante/Postnatal)

Number of PRBC transfusion	Antenatal		Post-natal	
	Frequency (n=100)	Percentage (%)	Frequency (n=100)	Percentage (%)
1 unit	42	42%	22	22%
2 units	18	18%	08	8%
3 units	05	5%	05	5%
4 units	01	1%	03	3%
5 units	Nil	0%	02	2%

Table 5: Number of FFP transfusion (Ante/Postnatal)

Number of FFP transfusion	Frequency (n=100)	Percentage (%)	Frequency (n=100)	Percentage (%)
1 unit	Nil	0%	01	1%
2 units	02	2%	01	1%
3 units	01	1%	01	1%
4 units	02	2%	2	2%
5 units	Nil	0%	Nil	0%
Number of RDP transfusion	Nil	0%	Nil	0%
Number of SDP transfusion	Nil	0%	Nil	0%
Number of Cryoprecipitate transfusion	Nil	0%	Nil	0%
Number of PRP transfusion	Nil	0%	Nil	0%

Table 6: Antenatal details

Number of Antenatal visits	Frequency (n=100)	Percentage (%)
Zero visits	11	11%
One visit	14	14%
Two visits	01	1%
Three visits	08	8%
Four visits	16	16%
Five visits	16	16%
Six visits	19	19%
Seven visits	05	5%
Eight visits	06	6%
Nine visits	Nil	0%
Ten visits	03	3%
Eleven visits	01	1%
Mode of delivery		
Emergency LSCS	26	26%
Elective LSCS	14	14%
Check curettage	11	11%
Normal vaginal delivery (NVD)	20	20%
Laparotomy	07	7%
Undelivered	22	22%
Comorbid conditions		
Gestational hypertension	01	1%
Non-severe preeclampsia (NSPE)	06	6%
Severe preeclampsia (SPE)	01	1%
Overt diabetes mellitus	02	2%
Gestational diabetes mellitus	02	2%
Chronic rheumatic heart disease	01	1%
No comorbid conditions	87	87%

Table 7: Past history of blood transfusion

Past history of blood transfusion	Frequency (n=100)	Percentage (%)
Yes	4	4%
No	96	96%
Complications		
Rash	01	1%
Fever	01	1%
Chills	02	2%
	07	7%
No complications	89	89%

DISCUSSION

Complications of pregnancy and childbirth associated with the need for blood transfusion may lead to morbidity and mortality if not managed correctly and in a timely manner. In the current study, the maximum and minimum age was 40 years and 18 years in the study population. The 21 to 30 years age group constituted the highest percentage among the study population. Similar results were observed in a study done by Osaheni et al,[7] showed majority of the study population were having 21 to 30 years of age group who received blood transfusion. In the present study, Primiparous and multiparous women constituted 30% and 70% among the study population respectively. It is in accordance to a recent study done in the year 2022, by Green G et al,[8] where multiparous women (65%) were in higher percentage compared to Primiparous women (35%).

In the present study, the Lower-middle class patients were in majority (44%), followed by Lower class (40%) and least were upper middle class patients (16%). In a similar study done by Barnes L et al,[9] in the year 2022, on Status of hospital-based blood transfusion services in low-income and middle-income countries: a cross-sectional international survey, similar results were observed.

In the present study, majority of the study population belonged to Second Trimester (42%), followed by

Third Trimester (40%) and First Trimester (15%), and least (3%) patients were from delivered category. These results were in similarity to a study done on high-risk pregnancy and its outcome among antenatal women attending rural primary health center in Puducherry, South India, by Majella MG et al,[10] where, Second Trimester women were high in number compared to other trimesters.

In the present study, the hemoglobin percentage of the study population was observed. It was revealed that, Pre-transfusion Hb and Post-transfusion Hb, majority (57% and 86%) of the patients were having Hb percentage between 7 to 9.9 gm%. A study was done in the year 2018 on the effect of intravenous iron sucrose on hemoglobin level, when administered in a standard-dose, to anemic pregnant women in rural Northern India, by Haldar P et al,[11] where the study population were having 7 to 9.9 gm%. Hemoglobin percentage.

In the present study, in the first Trimester bleeding, Incomplete abortion cases were 8%. Heavy bleeding in the first trimester, particularly when accompanied by pain, is associated with higher risk of miscarriage. Spotting and light episodes are not much associated, especially if bleeding lasts only for 1–2 days.[12]

In the current study the moderate anaemia was in high percentage (28%), targeting a haemoglobin level of more than 11 g/dL or complete resolution of anaemia may be preferred in those with an objection to blood products or at high risk for blood transfusions, such as those with a bleeding disorder, placenta previa or accreta, or multiple prior caesarean deliveries.[13]

In the present study, the Abruption cases were in high percentage (17%) and least is Placenta Previa (1%). Placental abruption is a life-threatening disorder for both the mother and the fetus. If the bleeding is not arrested, then the lives of the mothers and foetus are in jeopardy.[14]

The Caesarean section rate in our study was 39%, which was the above the upper limit set by WHO (Caesarean rate to be not more than >15%). The blood and blood components utilization was found to be high in Cesarean deliveries. In this study, the red cell transfusion rate in Caesarean sections and Vaginal delivery was 51.8% and 14.5% respectively. The Klapholz et al,[15] reported a transfusion rate of 1.7 % for vaginal deliveries and 5.2% for Caesarean deliveries. Goundan et al,[16] in his study found the transfusion rate of 12.2% for caesarean sections.

In the present study Antenatal cases with six visits were 19%, followed by four visits 16% and five visits 16%, respectively. Patients with 2 visits were 1% and Eleven visits were 1%, respectively. Status of the WHO recommended timing and frequency of antenatal care visits, this study was done in Asian population by Sarker BK et al,[17] in the year 2020, where the coverage of antenatal visits is quite high (6 to >6).

In the present study, mode of delivery parameter was assessed. It was observed that Emergency LSCS cases were in majority (26%), followed by undelivered ones (22%). Least were Laparotomy cases (7%). In the year 2018, a study done by Mishra N et al,[18] on the Decision Delivery Interval in Emergency and Urgent Caesarean Sections, similar results were seen.

In the present study, 96% of cases requiring blood transfusion were with no comorbid conditions followed by non-severe preeclampsia (NSPE) i.e., 6%. A study was done on the subject preeclampsia Incidence and Its Maternal and Neonatal Outcomes with Associated Risk Factors by Alexander Muacevicet al,[19] where their study showed the same results.

In the present study, majority (96%), of the study population were not having past history of blood transfusion. It is in accordance to a study done by Archana Solanki, et al,[20] in the year 2020, where exact same results were recorded.

In the present study, 96% of cases requiring blood transfusion has no blood transfusion related complications but 7% of cases were observed with surgical site infection. In a similar study done on post-caesarean wound infection: prevalence, impact, prevention, and management challenges, by Zuarez-Easton S et al,[21] in the year 2017, same results were observed.

CONCLUSION

Blood and component transfusion is the most essential entity of comprehensive obstetric care. Various obstetric emergencies are unpredictable, however antenatal risk assessment and correction of nutritional anemia gives a big advantage. Use of blood components should be encouraged. Measures to minimize the need of blood transfusion should be practiced aggressively. Documentation of indications and consent for blood transfusion should be done. Formulation and display of Institutional blood transfusion guidelines is strongly recommended. Adequate blood inventory always allays obstetrician's apprehension of blood availability. At the same time since in a country like India where demand is always more than supply, appropriate use of blood components is repeatedly emphasized.

REFERENCES

1. AdukauskieneD,VeikutieneA,AdukauskaiteA,VeikutisV,RimaaitisK.The usage of blood components in obstetrics. Medicina (Kaunas). 2010; 46(8):561-7.
2. ChawlaS,BalMHK,VardhanBS,JoseCT,SahooI.BloodTransfusion Practices in Obstetrics: Our Experience. J Obstet Gynaecol India. 2018;68(3):204-207
3. LewE,LionalKM,TagoreS.Obstetricredcelltransfusioninahigh-volume tertiary hospital: a retrospective cohort study. Singapore Med J. 2022;64(5):307– 312.
4. MammenJJ,AsirvathamES,LakshmananJ,SarmanCJ,Pandey A,RanjanV, Charles B, Mani T, Khaparde SD, Upadhyaya S, Rajan S. The clinical demand and supply of blood in India: A National level estimation study. PLoS One. 2022 Apr 6;17(4):1-15.
5. ThurnL,WikmanA,WestgrenM,LindqvistPG.Incidenceandriskfactorsof transfusion reactions in postpartum blood transfusions. Blood Adv. 2019;3(15):2298-2306.

6. Bowman Z, Fei N, Ahn J, Wen S, Cumpston A, Shah N, Craig M, Perrotta PL, Kanate AS. Single versus double-unit transfusion: Safety and efficacy for patients with hematologic malignancies. Eur J Haematol. 2019;102(5):383-388.
7. Osaheni, L Lawani, Chukwuemeka, A Iyoke Azubuike K Onyebuchi. Blood transfusion trends in obstetrics at the Federal Teaching Hospital in Abakaliki, South-East Nigeria. International Journal of Women's Health 2013;5: 407–412.
8. Green G, Tesler R, Marques A. Primiparous and Multiparous Women's Mode of Birth and Negative Emotions. Int J Environ Res Public Health. 2022;19(9):5189.
9. Barnes LS, Stanley J, Bloch EM, Pagano MB, Ipe TS, Eichbaum Q, Wendel S, Indrikovs A, Cai W, Delaney M; AABB Global Transfusion Forum. Status of hospital-based blood transfusion services in low-income and middle-income countries: a cross-sectional international survey. BMJ Open. 2022 Feb 15;12(2):e055017.
10. Majella MG, Sarveswaran G, Krishnamoorthy Y, Sivaranjini K, Arikrishnan K, Kumar SG. A longitudinal study on high risk pregnancy and its outcome among antenatal women attending rural primary health centre in Puducherry, South India. J Educ Health Promot. 2019; 29:8:12.
11. Haldar P, Kant S, Yadav V, Majhi J, Malhotra S, Kaur R, Kumar R, Singh AK, Archana S, Lohia A, Rath R, Ahamed F. Effect of intravenous iron sucrose on hemoglobin level, when administered in a standard-dose, to anemic pregnant women in rural Northern India. J Family Med Prim Care. 2018;7(4):762-768.
12. Hasan R, Baird DD, Herring AH, Olshan AF, Jonsson Funk ML, Hartmann KE. Association between first-trimester vaginal bleeding and miscarriage. Obstet Gynecol. 2009 Oct;114(4):860-867.
13. Schmidt P, Skelly CL, Raines DA. Placental Abruption. 2022 Dec 19. In: Stat Pearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2024 Jan–.
14. Shravya Govindappagari, Rachel A. Newman. Iron-deficiency anemia in pregnancy and the role of intravenous iron. 2021;6(7):20-24.
15. Klapholz H. Blood Transfusion in contemporary Obstetric Practice. Obstetrics and Gynecology. 1990; 75:940-3.
16. Goundan A, Kalra JK, Raveendran A et al. Descriptive study of blood transfusion in women undergoing Caesarean delivery. J Obstet.Gynecol.Res.2011:1-6.
17. Sarker BK, Rahman M, Rahman T, Rahman T, Khalil JJ, Hasan M, Rahman F, Ahmed A, Mitra DK, Mridha MK, Rahman A. Status of the WHO recommended timing and frequency of antenatal care visits in Northern Bangladesh. PLoS One. 2020 Nov 5;15(11):e0241185.
18. Mishra N, Gupta R, Singh N. Decision Delivery Interval in Emergency and Urgent Caesarean Sections: Need to Reconsider the Recommendations? J Obstet Gynaecol India. 2018 Feb;68(1):20-26.
19. Khan B, Allah Yar R, Khakwani AK, Karim S, Arslan Ali H. Preeclampsia Incidence and Its Maternal and Neonatal Outcomes with Associated Risk Factors. Cureus. 2022 Nov 6;14(11):e31143.
20. Archana Solanki, Chandra T, Singh A. Prevalence of red blood cell antibodies in whole blood donors: A single-centre experience in north India. Indian J Med Res. 2020;152(3):280-284.
21. Zuarez-Easton S, Zafran N, Garmi G, Salim R. Postcesarean wound infection: prevalence, impact, prevention, and management challenges. Int J Womens Health. 2017 Feb 17; 9:81-88.