

An Audit of Utility of Blood and Blood Components in Obstetrics and Gynaecology



Medical Science

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ABSTRACT

Severe anemia has been a major health problem among the women of child bearing age especially in developing countries like India. Many of the obstetric cases in labor require blood transfusion. Judicious use of packed cells is a boon in situations of limited availability of blood resources. The goal of modern transfusion practice is to provide appropriate replacement therapy with the blood components required. This study was conducted to know the pattern of clinical usage of packed red cells in Obstetrics and Gynaecology practice in a tertiary care center. Anemia (84.94%) was a major indication for packed red cell transfusion and O positive packed red cells (30.62%) was the most commonly transfused component. Most common age group requiring transfusion were between 15-25 age group (44.83%, n=591).

Introduction:

Anemia in women is common and worldwide problem that needs attention¹. Prevalence of anemia in pregnancy is reported to be up to 75% in many developing countries². Anemia is severe in these situations and is known to contribute significantly to maternal morbidity and mortality. Obstetric hemorrhage is one of the important causes of maternal deaths, causing 24% or an estimated 1,27,000 maternal deaths annually.³ Reported incidence of massive hemorrhage (2000ml or more) and life threatening obstetric hemorrhage is 3-5% and 0.1% respectively⁴

Maternal mortality in many countries can be reduced with the access to safe blood and components. This is more relevant for countries like India as obstetric patients present with severe anemia in their late third trimester and in labor when oral hematinic alone are insufficient to correct anemia.⁵ While whole blood transfusion which was the sole practice few decades ago is no more acceptable, this has rightly been replaced by components depending on the need for a particular condition.

To avoid circulatory overload, it is necessary to increase the hemoglobin and red cell volume without rising plasma volume and total blood volume⁶. Blood transfusion is recognized as one of the eight essential components of comprehensive emergency obstetric care (cEmOC).⁷

Pattern of usage of blood and its products is changing and the knowledge of requirements of type of product/s and sections of the department of Obstetrics and gynecology is essential to plan for the prevention of maternal catastrophes.

Materials and methods:

The data for the present study was collected from Blood bank records. Packed cells and other blood components issued to 591 obstetrics and gynecology patients over a period of one year were studied. Data from August 2011 to July 2012 was obtained. Details of blood group, age, indications for transfusion, section of hospital where blood components were used, were recorded carefully and the data was analyzed.

Results:

The total number of Whole blood and various components issued from the blood bank during this period of one year (August 2011 to July 2012) to the various wards of OBG were 1041 units.

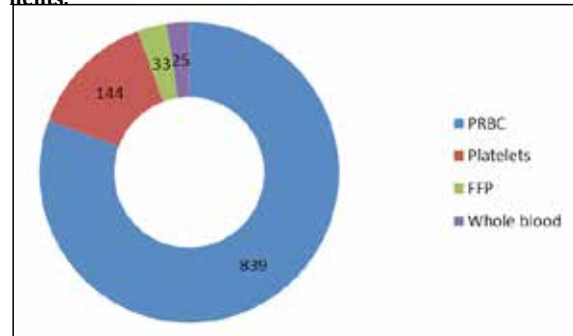
The ABO and Rh blood groups of 591 patients is shown in table:1. Commonest blood group was O positive (32.65%) and least common blood group was AB negative(9.33%).

Table 1: The ABO and Rh blood groups of patients

Blood group	Rh positive	Rh negative	No of patients	Total %
A	141	11	152	25.71
B	181	10	191	32.31
AB	46	09	55	9.33
O	184	09	193	32.65
Total	552	39	591	100

Total blood products used were 1041, of which 839 (80.59%) were packed red blood cells (PRBCs), 144 (13.83%) were platelets, 33 (3.17%) were fresh frozen plasma and 25 (2.40%) were whole blood.

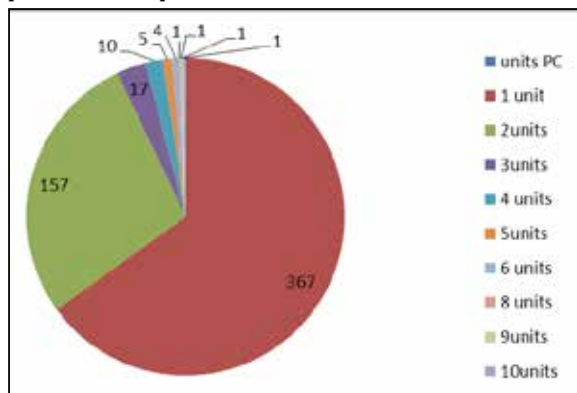
Chart 1: Showing utilization of Blood and Blood Components.



Of the 1041 units, 839(80.59%) units were packed red cells (PRBCs). An average of 1.53 units of packed red cells was issued to all the patients, which ranged from one unit (65.4%) in majority of the patients to thirteen units in severely sick patients. Age group for which packed cells were issued, ranged from 15 to 80 years, of which 265(44.83%) units were issued to women in the age group of 15 to 25 years.

Table 2: Packed red cell units used in various age groups:

AGE GROUP IN 591 RECIPIENTS OF BLOOD		
AGE	NUMBER OF PATIENTS	PERCENTAGE(%)
15-25 years	265	44.83
26-35	171	28.93
36-45	86	14.55
46-55	49	8.29
56-65	13	2.19
66-75	06	1.01
76-85	01	0.16
TOTAL	591	100

Chart 2: The pie chart shows the distribution of units of packed cells required.

About 475 units (56.61%) of PRBC were transfused to patients in labor room followed by 316 units (37.66%) in the post-operative obstetrics ward and four units 0.47% in gynecology pre-operative ward.

**TABLE-3 :
Usage of Blood and Blood components in various wards of OBG**

Ward	PACKED CELLS	PLATELETS	WHOLE BLOOD	FFP
LABOUR ROOM	475	90	12	25
ANTE NATAL WARD	20	-	-	-
OBSTPOST OPERATIVE	316	46	13	6
GYNEC PRE OPERATIVE	4	-	-	2
GYNEC POST OPERATIVE	24	8	-	-
Total	839	144	25	33

The next commonly used components were platelets 144(13.83% n=1041), mainly used for thrombocytopenia and Fresh frozen plasma 33(2.35% n=1041) and the least used was Whole blood which constituted only for about 25(2.40% n=1041). The most common cause for transfusion of Packed red cell was anemia which constituted about 509 (86.12%,n=591).

The most common indication for transfusion was anemia 509(86.12%).

Discussion:

Although therapy of blood transfusion in cases of severe anemia, trauma and during surgery is known since many decades, pattern of transfusion has changed since last two decades, as the components of blood were separated and given⁸. According to the need, deficient component alone can be replaced. There is no agreement on a definition of major obstetric hemorrhage.

Blood loss up to 1000 ml is not uncommon in the peripartum period and may be of little clinical significance. Blood loss >1500 ml; a decrease in hemoglobin of more than 4 g/dl; or an acute transfusion requirement of more than 4 units of packed red blood cells are suggested criteria. Definitions based on hemodynamic deterioration are unhelpful as maternal physiology often allows return until hemorrhage is advanced. Careful clinical observation and a high index of suspicion are required to detect bleeding early.⁹

In the present study the packed red cells 839 (80.59%) were the predominant components transfused, while whole blood constituted only 2.5%.

Primary purpose for red cell transfusion is to provide a mechanism for the transport of oxygen. The main difference between the whole blood and packed red cells is the approximate hematocrit of each, that is 40% and 70% respectively, the plasma volume which is two third less being advantageous in preventing circulatory overload is necessary to increase the hemoglobin and red cell volume without raising the plasma volume and total blood volume¹⁰. According to the American society of anesthesiologists task force on blood product replacement, PRBCs transfusion is rarely indicated with hemoglobin level greater than 10gm/dl and is almost always indicated with hemoglobin level less than 6gm/dl. However our data lacks the severity of anemia in the form of hemoglobin levels, which precludes the data on rationality of proportion of blood components used in our study¹¹.

The management of massive hemorrhage with blood products is changing. Rapid early replacement of coagulation factors and platelets is now becoming central to improve the outcome, mainly in higher ratios in respect to red cell units than previously recommended and using empiric transfusion based on clinical rather than laboratory parameters. Recommendations from the Association of Anesthetists of Great Britain and UK National Patient Safety Agency should be considered during major obstetric haemorrhage.⁸

Second most frequently used component in our study was platelets 13.83% (n=144) for which indication was thrombocytopenia is comparable to another similar study conducted at our own institute, PRBCs being predominant followed by platelets (23.85%).¹² Whole blood was used for only 2.4% (n=25).

The majority 65.4% (n=365) of the women required 1 unit of PRBCs and significant number of women 28% (n=157) needed 2 units. One of the sick patients required 13 units (highest units) of PRBCs in our study.

Utilization of PRBCs was maximum 475 (56.61%) units, in the third trimester and postpartum period hemorrhage 316 (37.66%) units were used in the obstetrics post-operative ward, thus 94.27% of PRBCs were used in the peripartum period itself. The most common age group which required blood transfusion was between 15-25years (44.83%), which is more prone for anemia and labour related complications.

The leading indication for transfusion of PRBCs in our study was anemia accounting for 86.12% (n=509) according to survey data 84.94% of pregnant woman were anemic¹³. In many publications it has been reported that Placenta accreta as a main cause for intractable Post partum haemorrhage and transfusion.

Conclusion

Despite improvement in peripheral health services, patients with severe anemia at term or in labour, still significantly require some form of transfusion. In the present study PRBCs were required by child bearing woman and the commonest indication was anemia. Blood components were used most commonly in peripartum period either in labor room or in post-operative obstetric ward. Majority of the woman required one unit of PRBCs. Thus component separation has helped clinicians to substitute only that part of blood which is deficient.

REFERENCE

- 1) Balarajan Y, Ramakrishnan U, Zaltin O, Shankar S, Subramanian V. "Anaemia in low-income and middle income countries". *Lancet*. 2011; (378):2123-35. | 2) Nynke B. Anaemia and micronutrient deficiencies. *British medical bulletin*. 2003;(67):149-60. | 3) Matsunaga et al. A Retrospective Analysis of Transfusion Management for Obstetric Hemorrhage in a Japanese Obstetric Centre. *ISRN Obstet and Gynaec*. 2012;(10):402-6. | 4) Balki M, Dhumne S, Kasodekar S, Seaward, Carvalho J C. Blood transfusion for primary post-partum hemorrhage : a tertiary care hospital review. *J Obstet and Gynaec. Canada*. 2008;(30):1002-07. | 5) Salhan S, Thripati V, Singh R, Gaikwad H. Evaluation of Hematological Parameters in Partial Exchange and Packed Cell Transfusion in Treatment of Severe Anemia in Pregnancy. *Hindwai Publishing Corporation Anemia* . 2012;(10): 1-7. | 6) K. A. Harrison. "Blood transfusion in severe anaemia in pregnancy," in *Proceedings of the International Seminar on Maternal Mortality, Family Planning and Biology of Reproduction*. B.N. Purandare and C. L. Jhaveri, Eds., pp. 67-70, Federation of Obstetric and Gynaecological Societies of India, Bombay, India, March 1969. | 7) Obaid T A. No Woman should die giving life. *Lancet*. 2007;(370):1287-88. | 8) Saule I, Hawkins N. Transfusion practice in major obstetric haemorrhage: lessons from trauma. *Int J Obstet Anaesth*. 2012;21(1):79-83. | 9) Walfish M, Neumann A, Wlody D. Maternal Haemorrhage. *British J of Anaesthesia*. 2009;103:47-56. | 10) Balajchman M A, Shepherd F, Perrault R A. Clinical use of blood, blood components and blood products. *J CMA*. 1979 ;(121):33-42. | 11) American Society of Anaesthesiologists Task Force on Blood Component Therapy: Practice guidelines for blood component therapy. *Anaesthesiology*. 1996, 84:732-47. | 12) Mallikarjunaswamy CM, Shashikala P, Kavita GU. Blood and components usage in a tertiary care hospital. *Int J Curr Research and Reviw* . 2012;4(12):47-53. | 13) Ramanathan G, Arulkumaran S. Post partum hemorrhage. *Curr Obstet Gynecol*. 2006;(16):6-13. |