

Transfusion of blood and blood component therapy for postpartum haemorrhage at a tertiary referral center

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Abstract

Objective: To determine the practice of transfusion of blood and blood products in cases of postpartum haemorrhage, at a tertiary referral center.

Methods: A retrospective study was conducted where medical records were reviewed for women, who either delivered or were admitted in labour suite with diagnosis of postpartum haemorrhage. The study period extended from Jan 2008 to Oct 2009. During a period of 22 months, records were reviewed for transfusion of blood and blood products in above group of women. Data were analyzed for descriptive statistics.

Results: During the study period, a total of 4744 patients were admitted in the labour suite. A total of 113 (2.36%) women were diagnosed with Post partum haemorrhage. Uterine atony was the commonest cause of PPH, followed by genital tract trauma. A total of 81(71%) women received transfusion of blood and blood components (1.6%). The mean blood loss was 1088 ml (± 584 ml). Transfusion of blood and blood component therapy was significantly more in women who underwent caesarean section, compared to those women who delivered vaginally.

There was one case of acute tubular necrosis due to PPH, and seven maternal deaths. The mean hospital stay was of ± 3 days.

Conclusion: In this hospital based study, the prevalence of PPH was 2.36 %, and the rate of transfusion of blood and blood products was 1.6%.

Keywords: Post partum haemorrhage, uterine atony, genital tract trauma. Transfusion (JPMA 61:343; 2011).

Introduction

Obstetric haemorrhage is a leading cause of maternal morbidity and mortality in both developed and developing world. World Health Organization, (WHO) estimates that haemorrhage at the time of delivery, complicates around 10% of all live births globally. It is the leading direct cause of maternal death (28%), followed by sepsis, hypertensive disorders, and obstructed labour.¹

It is difficult to accurately assess blood loss at the time of delivery. Generally speaking, blood loss of > 500 ml after vaginal delivery, and >1000 ml after Caesarean section is regarded as postpartum haemorrhage.^{2,3} Major postpartum haemorrhage (PPH) is defined as blood loss > 1000 ml,⁴ and blood loss > 1500 ml is classified as massive.⁵ Laboratory criteria of fall in haemoglobin concentration, and clinical sign and symptoms of shock, hypotension, pallor, Oliguria are also hallmarks of acute blood loss.

Blood and blood component therapy is an important tool in the management of PPH. It is considered appropriate to transfuse, if the blood loss is between 1.5-2L.⁶ Haemoglobin concentration at the time of delivery is an important trigger for transfusion of blood and blood component therapy. Lack of safe and easily available

transfusion services increases the morbidity and mortality due to PPH. Other haemostatic agents which can be used to control haemorrhage include antifibrinolytic drugs, DDAVP(desmopressin) and activated recombinant factor VII. Transfusion of blood and blood products is associated with risks, including transmission of a number of viruses, bacterial contamination and immune reactions.⁶ There is dearth of literature on the appropriate use of blood and blood products in the setting of PPH in obstetrics.

The study was carried out with the objective to see the practice of transfusion of blood and blood products in the setting of PPH at a tertiary referral center.

Patients and Methods

This study was done at the department of Obstetrics and Gynaecology Unit 3, Dow University of Health Sciences & Civil Hospital Karachi. This is a tertiary referral center, which receives patients not only from Karachi city, but also from neighbouring districts and Baluchistan province. Majority of patients are referred from peripheral hospitals and other cities.

The study period extended from January 2008 to October 2009, 22 months. During this period, the total number of deliveries in the unit were 4774. In all 113 women

had primary postpartum haemorrhage.

Post partum haemorrhage (PPH) is traditionally defined as loss of > 500ml of blood. Blood loss within 24 hours of delivery is Primary PPH, and blood loss after 24 hours, but within 6 weeks of delivery is called secondary PPH. Estimation of blood loss is recorded by the resident delivering the patient, and is noted down in the medical case sheet. The diagnosis of PPH was made on resident's assessment, which in turn was made on both clinical and laboratory criteria. The department follows the standard protocol for management of PPH, described previously.⁷

Also analyzed from the medical records were demographic characteristics, etiological factors, treatment for PPH, and blood and blood products transfused. Coagulation abnormalities were considered if Prothrombin time, and partial thromboplastin time were >1.5 times normal. It is the department's protocol to send coagulation studies in women with PPH. These include Prothrombin time, partial thromboplastin time, and recently facilities for d-dimer and plasma fibrinogen level have also been added to the above list. These tests are done free of cost at Civil Hospital's (Central Lab) In cases when laboratory services were closed on public holidays, arrangements were made from donation account of the unit.

These details were reviewed from the medical case records and from specially predesigned Performa for PPH (the statistical data of the department is maintained in this manner, each disease is entered on a separately designed proforma). The data was entered in SPSS Version 16; simple frequencies were calculated where appropriate. Mean and standard deviation were calculated for clinical variables like haemoglobin, number of transfusions of RBC, fresh frozen plasma, Prothrombin and partial thromboplastin time, hospital stay and estimated blood loss.

Results

During the study period from January 2008 to October 2009, there were a total of 4774 deliveries, in the department of Obstetrics and Gynecology Unit 3, Civil Hospital Karachi. In all 113 (23.6/1000 deliveries) were diagnosed as cases of PPH. The mean age of women in the study was 27 ± 5.32 years. Thirty nine (34%) were primigravida, and thirty six (31%) were multigravida. Normal Vaginal delivery was conducted in (75.2%), followed by Caesarean section (16.8%) and instrumental delivery (8%). (Graph 1) Obstetrical hysterectomy was done in 11(9.7%) women. Uterine atony (36%) was the commonest cause of PPH, followed by genital tract trauma (23%). The mean haemoglobin concentration at the time of delivery was 7.32 ± 2.22 gm/dl. Transfusion of blood and blood products was carried out in 81 (71%) women. These women on an average received 2 units (range 1-9) of Red Blood Cell (RBC).

Transfusion of RBC was more in women who underwent caesarean section (3.3 ± 2.1), compared to women who delivered vaginally (2.5 ± 1.6). However, the mean difference was not statistically significant. Fresh frozen plasma was required in 32 (27%) women. These women required at least 1 unit of FFP (range 1-8). Need for transfusion of plasma was also greater in women who underwent caesarean section (p 0.001 versus 0.060), when compared to those women who delivered vaginally. Fresh frozen plasma was administered for correction of coagulation abnormalities, or for continued oozing. Platelet concentrate (PLT) were given in 11 (9.7 %) women. Of these 7 women received pooled whole blood platelets, and 3 women received platelets derived from apheresis. Platelets were administered, if the counts were < 80,000 in women undergoing surgery, or in cases of continued haemorrhage. None of the women received cryoprecipitate. This is explained by the fact that the above component is not available in our Blood Bank, and if required, has to be arranged from outside, sources and most of the women were in hypovolaemic shock. Coagulation abnormalities were seen in 8 (7%) patients. Activated recombinant factor VII was administered in 5 women, for control of massive PPH. During the above study period, we had seven maternal deaths due to haemorrhage. Two of the maternal deaths were in women who had jaundice, and were in coagulopathy, where as one maternal death occurred within 10 minutes of arrival at hospital. One woman developed acute tubular necrosis, and required dialysis. Nine women (7%) required stay in intensive care, where as the mean stay of women in hospital was 3 ± 2.62 days. The mean blood loss was 1088 ± 584 ml.

Discussion

Postpartum haemorrhage (PPH) is a leading cause of maternal death, and is also responsible for increased maternal morbidity. This is a hospital based study; it does depict the correct rate of transfusion of blood and blood products for PPH.

Uterine atony and genital tract trauma were the leading causes of PPH. This has been observed in both national and international literature.⁸⁻¹⁰ Women giving birth for first time are at increased risk for PPH.² Similarly caesarean sections has also been found to be a casue as observed by James AH et al,¹⁰ operative deliveries were also more frequently associated with transfusion of blood and blood products in our study. (0.001 versus 0.089).

In the present study women, who were given blood and blood component therapy, 59 received red cell concentrate, 32 received plasma, along with red cell concentrate, whereas platelet concentrate were required in 11 women. The main indication for transfusion of FFP was correction of coagulation parameters. Platelets were

transfused in women, with count below 80,000, and required any form of surgical intervention. Platelets were also transfused, in the event of continuous oozing from the operative site, and of massive haemorrhage.

Transfusion rates in the postpartum period have been estimated between 0.6% to 1.4%.¹¹ The rates of transfusion of blood and blood component therapy is different in various sets of populations. A Canadian study, involving 33,631 deliveries, found a rate of 0.31% for transfusion of blood and blood products in PPH.¹² The rate of transfusion for PPH in a hospital based study from the United States was 0.86%¹⁰ Reyal F et al,¹³ in another hospital based study from France, found transfusion rates of 0.26% in their population. In our study the rate of transfusion of blood and blood products was 1.6%, higher than similar studies from developed countries. This may be attributed to low haemoglobin (7.32±2.2 gm/dl) concentration at the time of admission to labour room for delivery. It may also be attributed to more sick patients referred to the hospital. Activated recombinant factor VII (rFVIIa) for control of bleeding, in cases of massive PPH was also used. We do not have the facility for uterine artery embolization, in our unit. Since our last report on use of activated recombinant factor VII, a single dose of drug is available in labour suite for emergency situations.⁷ Its use requires a consensus opinion between senior obstetrician, haematologist and anaesthetist. We did not have any maternal death or adverse thromboembolic reaction, in women who required rFVIIa.

There were 7 maternal deaths in the study. Though, studies from Western countries did not have maternal deaths in their study population,¹⁰⁻¹³ local studies have quoted similar rates of maternal death due to PPH.^{8,14} Three maternal deaths were due to Hepatitis E (HEV) virus infection, whereas 4 women died due to direct obstetrical reasons. It has also been reported earlier on maternal deaths due to HEV.¹⁵ These women were second gravida, and were in third trimester of pregnancy. Apart from deranged liver function tests, they had coagulation abnormalities. Apart from medical complications of hepatic encephalopathy, cerebral oedema and coagulopathy are life threatening complications of HEV infection.¹⁶

There are limitations of the above study. It was a

hospital based study, so does not give a true picture of actual figures of PPH in the population. But it does give an idea of burden on blood bank facilities at the institute.

Conclusion

Obstetric haemorrhage is an important cause of maternal deaths. Annually, around 150,000 women die in the developing world from haemorrhage. Apart from antenatal care, delivery in skilled hands and transfusion of blood and blood products play an important role in the management of PPH.

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