

The Use of O Universal Profile Within Hemorrhagic Shock Post-partum Bleeding Patients in Dr. Soetomo General Hospital's Emergency Installation

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ABSTRACT

Background: Hemorrhagic shock is one of the most common types of shock in trauma patients, and it is defined as acute blood volume loss. One of the causes of hemorrhagic shock is post-childbirth bleeding or post-partum bleeding. The most important management for patients who experience post-partum bleeding is blood transfusions. Type-O blood is known as a universal donor, because someone with type- O blood can transfuse theirs to recipients with blood types other than O. Giving blood transfusions to pos-tpartum bleeding patients is expected to extend their life expectancy, however it cannot be denied that there are quite a several patients who died after receiving transfusions from universal type O blood.

Objective: This study aims to determine the profile and effect of universal O use on hemorrhagic shock within post-partum bleeding patients at IGS RSUD Dr. Soetomo Surabaya.

Methods: This research was conducted by a descriptive retrospective method by observing the patient's medical record data in the central medical record room of Dr. Soetomo Hospital, Surabaya.

Result: There were 17 patients with hemorrhagic shock due to post-partum hemorrhage who received blood transfusions from universal O donors at Dr. Soetomo Surabaya. From the obtained data, the patient age group was dominated by the 28 years old group (23.5%). Transfusion history within patients with the most hemorrhagic shock due to post-partum bleeding were patients who received transfusions with packed red cell (PRC) O + (76.5%). As for transfusion reactions that occur within patients, there are no data on transfusion reactions.

Conclusion: The 28 years old group was the largest one that received transfusions from the universal group O blood. History transfusion of hemorrhagic shock due to post-partum bleeding patients shows that most of them are those who received PRC O + transfusions. There are no data regarding the transfusion reactions which occurred in these patients.

Keywords: blood transfusion; maternal mortality; O universal; profile; transfusion reaction

INTRODUCTION

Hemorrhagic is one of the most common types of shock in trauma patients. Hemorrhagic is defined as an acute loss of blood volume. The response of the trauma patient to blood loss is made more complex by the movement of fluid between the fluid compartments in the body, particularly in the extracellular fluid compartment, leading to hypovolemic shock. One of the causes of hemorrhagic shock is post-partum bleeding or post-partum hemorrhage.^{1,2} According to data from the Indonesian Ministry of Health, the three main factors for maternal mortality are bleeding (28%), eclampsia (24%), and infection (11%). Anemia and chronic energy deficiency (KEK) in pregnant women are the main causes of bleeding and infection which is a major factor in maternal mortality.³ According to WHO data, in various countries at least a quarter of all maternal deaths are caused by bleeding, the proportion ranges from less than 10 percent to nearly 60 percent.⁴ Blood type O is used because blood type O is a universal donor blood type, so it can be given to patients with blood type other than O if there is no available blood group that suits the patient, to avoid wrong transfusions that can cause patient death, as in the case occurred in a patient at Agoesdjam Ketapang Hospital, West Kalimantan on January 9, 2009, where a patient with blood type B was given blood type A blood donation.⁵

Post-partum bleeding is bleeding that occurs after delivery exceeding 500 mL in vaginal delivery or more than 1000 mL in cesarean section.⁶ Post-partum hemorrhagic is one of the main causes of maternal death worldwide with an estimated 140.000 women dying each year or equal to 1 woman dying every 4 minutes.⁷ To support physiological

hypervolemia, one of the treatments is through blood transfusion. According to WHO, every year there are 14 million mothers or 11.4% suffering from post-partum Hemorrhagic (HPP) worldwide. In developing countries, the incidence of HPP is 60% in 100.000 maternal deaths every year and is caused by poor delivery management, especially in the third stage which can cause excessive blood loss. The incidence of HPP in Padang City was 1 in 15 incidents in 2012 and increased to 5 out of 15 incidents in 2013, so HPP is still the biggest cause of maternal death in the world.⁸ Management for patients with post-partum hemorrhagic are routinely avoiding an episiotomy, giving oxytocin to control bleeding after delivery, screening for anemia and thalassemia, and the main treatment is blood transfusion.

Blood transfusion is a kind of transplant, namely the transfer of a living device from one person to another. Blood type O is well known as a universal donor, because someone with blood type O can transfuse their blood to recipients with blood type other than O, namely A, B, and AB. However, the ideal transfusion is a transfusion carried out by giving blood to a recipient with the same ABO blood group system between the recipient and the donor and avoiding giving blood group O to other groups, intending to avoid incompatibility in other blood group systems that can cause severe transfusion reactions can even lead to the death of the patient.⁹ Transfusion reactions are divided into 2, namely rapid transfusion reactions, where transfusion reactions occur during the transfusion until 48 hours afterward. Rapid transfusion reactions consist of heat, hemolytic, allergic, and septic transfusion reactions. While the slow

transfusion reaction is a transfusion reaction that occurs more than 48 hours.¹⁰ In addition, there is one type of transfusion reaction, namely TRALI. Transfusion Related Acute Lung Injury (TRALI) was defined as a new acute lung disorder (ALI) that occurred during or within six hours of a transfusion that was not explained by other risk factors for ALI. Although this case is relatively rare, TRALI can cause a serious case because it has the potential to cause death.¹¹

Giving blood transfusions to patients with post-partum hemorrhagic is expected to prolong the patient's life expectancy, but it cannot be denied that some patients die after receiving transfusions from universal blood type O. Therefore, the author will conduct a study on the description of the transfusion reaction of post-partum bleeding patients who died and the profile of post-partum bleeding patients who survived.

METHOD

This type of research is descriptive research. The research design used a retrospective study using medical records of patients with hemorrhagic shock due to post-partum bleeding at the Emergency Installation of Dr. Soetomo Hospital. This study describes the profile of universal O use in patients with hemorrhagic shock in the form of a description of transfusion reactions in patients who died and patients who survived. Then, the data obtained will be processed and presented in tabular form.

The population is all patients with hemorrhagic shock due to post-partum bleeding at the Emergency Installation of Dr. Soetomo Hospital. The sample in this study were patients with hemorrhagic shock due to post-partum hemorrhagic

who were taken by total sampling, namely the technique of taking all samples that met the inclusion and exclusion criteria. The inclusion criterium is patients who experience post-partum hemorrhagic shock and receive donors from universal blood group O; the exclusion criterium is patients who experience post-partum hemorrhagic shock and receive other blood type donors. The sampling technique that will be used in this study is a non-random sampling technique.

RESULTS

Table 1. Patients by age group (in years)

Age	Frequency	Percentage (%)
23	1	5.9
25	1	5.9
26	1	5.9
28	4	23.5
30	1	5.9
32	2	11.8
33	1	5.9
36	1	5.9
37	3	17.6
38	1	5.9
39	1	5.9
Total	17	100.0

Table 1 shows the distribution of patients who received blood transfusions from the universal blood group O by age group. Based on Table 1, age patients who received blood transfusions from the universal O blood group were dominated by the age group of 28 years, namely 4 (23.5%) patients.

Table 2. Distribution of patient's blood transfusion history

Variable	Frequency	Percent age (%)
PRC O+	13	76.5
WB O+	2	11.8
WB O+ and PRC O+	1	5.9
PRC O- and WB O-	1	5.9
Total	17	100.0

Table 2 shows the distribution of history of blood transfusions experienced by patients. Based on Table 2, the group with the history of transfusion in patients with hemorrhagic shock due to post-partum bleeding was mostly patients who received transfusions with PRC O+, as many as 13 (76.5%) patients.

Table 3. Distribution of patient's transfusion reactions

Variable	Frequency	Percentage (%)
No Transfusion Reaction	17	100.0

Table 3 shows the distribution of transfusion reactions that occurred in patients after receiving transfusions of universal blood group O. Based on table 3, no patient had a transfusion reaction after receiving a blood transfusion of universal O blood group.

DISCUSSION

This study describes the profile of patients with hemorrhagic shock due to post-partum hemorrhagic who received blood transfusions from universal O donors at RSUD Dr. Soetomo Surabaya. According to research conducted by Friyandini, et al at RSUP Dr. M. Djamil Padang, West Sumatra, it was found that the age group of patients who

experienced the most post-partum hemorrhagic was the age group of 20-34 years as many as 49 (76.6%) patients from a total of 64 patients, of which the age group of 20-34 was healthy reproductive age. The high rate of post-partum hemorrhagic in the age range of 20-34 years is caused by several possible factors, such as short gestational intervals, Hb levels, length of parturition, previous delivery history, previous antepartum or post-partum bleeding history, history of cesarean section, macrosomia, multiple pregnancies, and also the factors of medical personnel who assist the delivery of the patient in question.¹²

In a study conducted by Alexander et al at Parkland Hospital, it was found that out of 593 patients who received transfusions from PRC, it was found that 12 patients had complications in the form of acute tubular necrosis, 2 patients experienced complications in the form of adult respiratory distress, 24 patients experienced complications in the form of pulmonary edema, 2 patients experienced complications such as hypofibrinogenemia, 7 patients were admitted to the ICU, and 1 patient died. Meanwhile, in 659 patients who received transfusions from WB, it was found that 12 patients had complications in the form of acute tubular necrosis, 3 patients experienced complications in the form of adult respiratory distress, 47 patients experienced complications in the form of pulmonary edema, 1 patient experienced complications such as hypofibrinogenemia, 4 patients were admitted to the ICU, and no patients died.

The deaths that occurred in patients who received blood transfusions from PRC were caused by patients suffering from diabetes and chronic congestive heart

failure. The patient underwent a cesarean section for prolonged labor and the fetal heart rate pattern did not improve. The patient experienced a rapid decline in cardiac status postoperatively and died of respiratory failure. In addition, Alexander, et al also revealed that giving blood transfusions from PRC can increase the risk of acute tubular necrosis, as obtained from a study conducted at Parkland Hospital.¹³ However, it should be noted that the administration of PRC, especially PRC O, can be given to patients in an emergency condition, and administration of PRC O with Rh (+) can be considered. In research conducted by Lestari, et al. in class X SMA Negeri 11 Bengkulu Utara, of 34 students consisting of 13 boys and 21 girls, it was found that none of the students had Rh (-). This happens because rhesus negative blood (Rh-) is found in about 15% of the white race, whereas in Asian races it is rare to find rhesus negative, unless mixed marriages occur with foreigners who are rhesus negative. In women, rhesus differences can cause problems if pregnancy occurs (mother and child are rhesus different), where in the first baby, the risk of developing antibodies is 8%, and in subsequent pregnancies as a result of sensitivity in the first pregnancy, it is 16%. So that the difference in rhesus can cause erythroblastosis fetalis.¹⁴

Research conducted by Thurn, et al in Stockholm County, Sweden, found that from 12.183 patients, 96 patients had a transfusion reaction. Transfusion reactions that occur are caused by the possibility of increased levels of antibodies against HLA or human neutrophil antigens and other antigens expressed on leukocytes, platelets, and red blood cells. Antibodies to HLA are seen in 10-50% of pregnant women and will increase with increased pregnancy

rates.¹⁵ Risk factors that can cause mild transfusion reactions such as fast and slow transfusion reactions are errors in crossmatch, infection screening, and reactions to plasma proteins in donors, while risk factors for severe transfusion reactions such as TRALI are delayed patient handling, blood for donors. contains excessive plasma, and others. Meanwhile, in a study conducted at Dr. Soetomo Hospital, Surabaya, no data on transfusion reactions were found in patients, it may be due to the possibility, namely because the patient did not experience a transfusion reaction, but it could also be because the patient may have had a transfusion reaction but was treated immediately or the existence of inaccuracies in completing the patient's transfusion reaction data in the medical record.

CONCLUSION

The age group of patients who most received blood transfusions from universal O donors due to post-partum hemorrhagic was 28 years (23.5%). Thirteen from 17 patients had history receiving transfusions with PRC O+. There were no transfusion reactions, it may be because of the patient did not have a transfusion reaction, the patient may have had a transfusion reaction but was immediately treated, or inaccuracy in completing the patient's transfusion reaction data in the medical record.

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