

**Work Conference VIII
Annual Scientific Meeting XIV**
Indonesian Society of Clinical Pathologist and Laboratory Medicine (ISCPaLM)

Regional Scientific Meeting
**Asian Society for Clinical Pathology and
Laboratory Medicine (ASCPaLM) 2015**

Abstract & Program Book

Editor :
Ida Parwati
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Department of Clinical Pathology
Faculty of Medicine, Universitas Sam Ratulangi
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Free Paper
Presentation



Abstract

The differences Increase in Hemoglobin (Hb) in 6-12 hours and 12-24 hours Post Transfusion

Linda Rosita

Department Of Clinical Pathology, Faculty Of Medicine, Islamic University Of Indonesia

Introduction: Monitor the levels of Hb post transfusion is an important thing to be done in assessing the success of the transfusion. It takes the right time and as early as possible in determining when to monitor Hb post transfusion. This research aims to assess whether there is a difference in the levels of Hb 6-12 hours post transfusion with 12-24 hours post transfusion.

Methods: the design of the study was observational, analytic, where subject matter criteria research is patients who get transfusions PRC (packed Red Cell and whole blood cell) without seeing a diagnosis of the disease. Then from the subjects of the research were divided two groups, namely, the first group of patients monitor Hb at 6-12 hours post transfusion and a second group that monitors patients on Hb in 12-24 hours post transfusion.

Results: Increase Hb in 6-12 hours post transfusion ranges from 10-30% of the value of the original, while the increase in Hb Hb at 12-24 hours post transfusion ranges from 15-37% of the value of the original Hb. From the results of the test T test showed the value of $p = 0.76$ ($p > 0.05$)

Discussion: Post transfusion 6-12 hours have shown increase in Hb from the State prior to transfusion. This is expected from the purpose of transfusion. The need to establish the optimal time and appropriate to monitor Hb, where the selected time not too quick nor too long in assessing progresivitas therapy. Some of the things that influence the levels of Hb is the activity levels of 2.3 difosfoglisericide.

Conclusion: There was no meaningful difference in monitor Hb on at 6-12 hours with 12-24 hours Post Transfusion

Keyword: post transfusion, monitors the levels of Hb

Differences in Hemoglobin (Hb) Increase at 6-12 Hours and 12-24 Hours Post-Transfusion

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INTRODUCTION

Every year the need for blood transfusion increases. In the United States, every 2 seconds there is one person who needs blood. More than 41,000 blood donors are needed daily and 30 million blood components are transfused each year.¹

Monitoring post-transfusion Hb levels is essential for assessing transfusion success. The time factor of post transfusion Hb examination needs to be established, in order to assess the success of blood transfusion. The main purpose of blood transfusion is to save lives and improve health status.

Some people require blood transfusions because of surgery, accidents, disasters that cause a lot of blood loss. Some others need blood from illnesses such as severe infections or liver diseases that can interfere with the process of blood formation, diseases that cause anemia such as kidney disease or cancer, and blood disorders such as hemophilia.²

Various products of transfused blood components, including packed red cell (PRC), Whole Blood (WB), TC (trombocyte Concentrate), FFP (Fresh Frozen Plasma). Whole Blood (WB) is a liquid of various blood cells that joins in a yellowish liquid called plasma. Packed Red Cells (PRCs) are from WBs that have been largely reduced. Platelet concentrate is a component of blood whose main contents are platelets. Fresh frozen plasma (FFP) is a plasma that is frozen within 8 hours of taking. Among the blood components, the most widely used to raise Hb is PRC.³

Packed Reds Cells are transfused in patients with anemic and bleeding indications. Acute bleeding with loss of more than 15% of blood volume should immediately get transfusion. Preoperative patients with Hb <9.0 g / dl who have a blood loss of > 500 ml during surgery also require blood transfusions. Patients with Hb <7.0 g / dl with severe pain, Hb <8.0 g / dl with acute coronary syndromes, Hb <10.0 g / dl with uremia or bleeding because thrombocytopenia requires blood

transfusion. In addition, patients with sickle cell disease require regular blood transfusions.⁴

PRC transfusion can increase hemoglobin and blood hematocrit. One PRC unit will raise the hemoglobin in adults on average by 1 g / dl and raise the hematocrit by 3%.⁵ However the theory does not limit the volume for one unit. As it is known that the volume of each pockets of PRC is not the same. The average PRC volume is between 250-300 ml for the regular bag while for pediatric packs an average of 50-60 ml. According to Elzik et al (2006), the transfusion PRC can increase the hematocrit value by $6.4\% \pm 4.1\%$ per liter of transfused blood. In other words, the hematocrit will increase by $1.9\% \pm 1.2\%$ per 300 cc of transfused blood.⁶

Several studies have shown the time interval of hemoglobin after transfusion affects the increase in hemoglobin values. According to the study of Wakhidah et al. (2013), the increase in hemoglobin chest occurred at 6 hours post-transfusion examination and then decreased at the 12 hour examination and increased again on 24 hour examination. This study aims to assess whether there is a difference in Hb levels of 6-12 hours post transfusion with 12-24 hours post transfusion.⁷

RESEARCH MATERIAL AND PROCEDURE

The study was conducted retrospectively observational by using data of Hb examination on pre and post transfusion. The subjects of the study were patients receiving PRC and WBC transfusions from all disease diagnoses. The inclusion criteria in this study are subjects that have complete data both pre Hb and post pre-examination results. Laboratory tests include routine blood tests (Hb, RBC, and Hct).

The operational definition of the variables used is the criteria of Hb pre-transfusion examination is the Hb examination performed before the transfusion, which indicates the doctor transfuses. While the criteria for Hb post transfusion examination is Hb examination performed after transfusion, divided into 2 groups i.e. 6-12 hours after transfusion and 12-24 hours after transfusion.

RESULT AND DISCUSSION

A total of 98 persons were the subject of the study, meeting the inclusion criteria of patients receiving PRC and WB transfusions from all disease diagnoses and

who had complete data both pre and post Hb examinations. Laboratory tests include routine blood tests (Hb, RBC, and Hct).

The subjects were divided into 4 groups of blood group that is group A, B, AB, and O years. While the study subjects were limited from patients receiving a transfusion type of PRC, WB and who obtained both (PRC & WB).

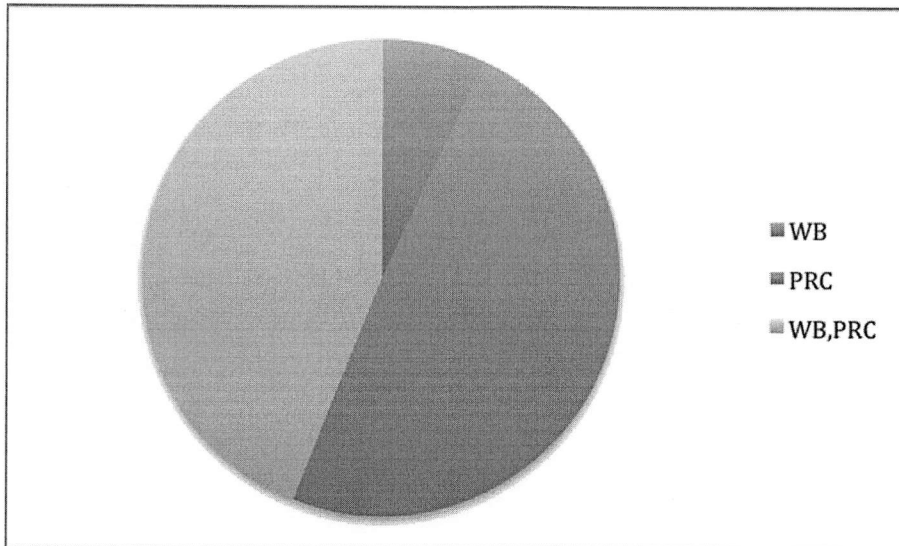


Figure 1. Blood Type of Research Subject

Hb subyek penelitian tertinggi dari golongan A yaitu 12,3 g/dL dan terendah 5,3g/dL . Sementara Hb subyek penelitian tertinggi dan terendah berturut-turut dari golongan B yaitu 11,2 g/dL dan terendah 6,7 g/dL, dari golongan AB yaitu 12,3 g/dL dan 1,8 g/dL, dan dari golongan O yaitu 10,5 g/dL dan 1,8 g/dL. Selengkapnya karakteristik subyek penelitian dapat dilihat pada tabel 2.

The highest Hb of research subjects of class A is 12.3 g / dL and the lowest is 5.3g / dL. While the highest and the lowest Hb of research subjects of class B are 11.2 g / dL and 6.7 g / dL respectively, and those of group AB are 12.3 g / dL and 1.8 g / dL, and also those of group O are 10.5 g / dL and 1.8 g / dL. The detailed characteristics of research subjects can be seen in table 1.

Table 1. Characteristic of Research Subject

Characteristic	Total	%
Blood Type		
A	29	30
B	27	28
AB	16	16
O	26	26

Component Type	
PRC	77
WB	11
PRC and WB	69

This study shows variations of all blood groups requested, as there was no dominant demand from one type of blood group. However, Group A, which has been the most populous in the population, also shows more demand from other blood groups.

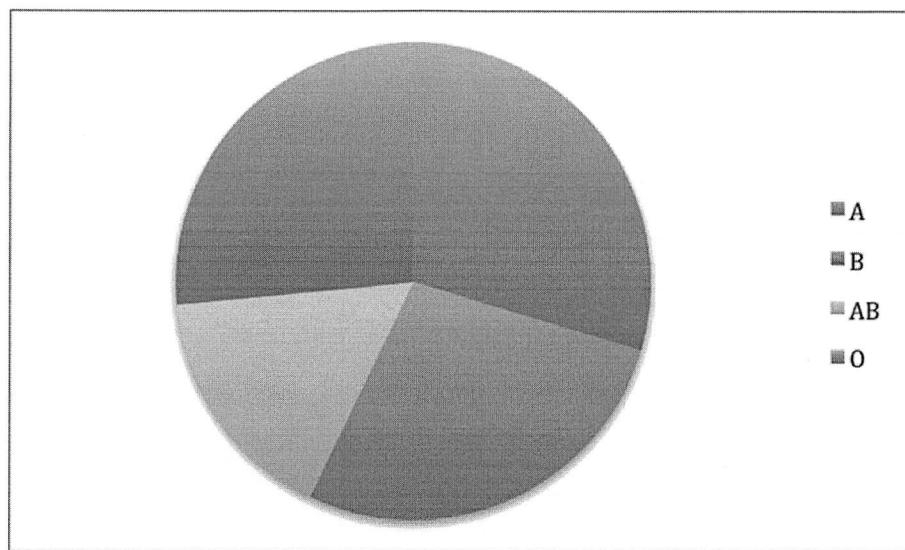


Figure 2. Blood Type of Research Subjects

This study shows the Hb increase at 6-12 hours post transfusion ranged from 10-30% of the original Hb value, while Increase Hb on 12-24 hours post transfusion ranged from 15-37% of the original Hb value. From T test result shows p value = 0.76 ($p > 0.05$).

Table 2. Average Hb Increase

	Post-Transfusion	Post-Transfusi
	6-12 hours	12-24 hours
A	2,6	3

B	1,1	1,2
AB	0,3	0,5
O	1,7	2,1

P = 0,76 (p<0,01)

Table 2 shows no difference in Hb levels examined between 6-12 hours post transfusion and 12-24 hours post transfusion, meaning the clinician simply checks changes of Hb levels over a 24 hour period, either choosing 6-12 hours post transfusion or 12-24 hours post transfusion. A quick time to assess the success of a transfusion is also an important part of choosing the right time for both times.

Packed Reds Cells are transfused in patients with anemic and bleeding indications. Acute bleeding with loss of more than 15% of blood volume should immediately get transfusion. Preoperative patients with Hb <9.0 g / dl who have a blood loss of > 500 ml during surgery also require blood transfusions. Patients with Hb <7.0 g / dl with severe pain, Hb <8.0 g / dl with acute coronary syndromes, Hb <10.0 g / dl with uremia or bleeding because thrombocytopenia requires blood transfusion. Besides, patients with sickle cell disease require regular blood transfusions.⁴

PRC Transfusion may increase hemoglobin and blood hematocrit. One PRC unit will raise the hemoglobin in adults on average by 1 g / dl and raise the hematocrit by 3% .⁵ But the theory does not limit the volume for one unit. As it is known that the volume of each pockets of PRC is not the same. The average PRC volume is between 250-300 ml for the regular bag while for pediatric packs an average of 50-60 ml. According to Elzik et al (2006), the transfusion PRC can increase the hematocrit value by 6.4% ± 4.1% per liter of transfused blood. In other words, the hematocrit will increase by 1.9% ± 1.2% per 300 cc of transfused blood.⁶

CONCLUSION : There is no significant difference between Hb monitors at 6-12 hours and 12- 24 hours post-transfusion.

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