



COMPARATIVE HEMOGLOBIN AND HEMATOCRIT BEFORE AND AFTER DONATION TO BLOOD DONATE IN UNIT TRANSFUSION YOGYAKARTA CITY

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Abstract

Blood is one of the main components in the human body. The people's need for blood is high, therefore the blood service in Indonesia should have good quality and total services. Unit Transfusion Yogyakarta City is one of the good services in the blood donation. In the blood donation, examination hemoglobin and hematocrit are important to selection for donors. The aim of this study is to determine comparative in hemoglobin and hematocrit levels before and after donors in UTD PMI Yogyakarta City. The type of research used was experimental with cross sectional research design. The sampling technique used was accidental sampling with a total sample of 67 donors. Based on the results of statistical tests on the data obtained, the results obtained with p value < 0,05 which is significantly different between the hemoglobin level before and after the donor. Based on these result there were differences in hemoglobin and hematocrit levels before and after of blood donation in Unit Transfusion PMI Yogyakarta City.

Keywords: *hemoglobin level ; hematocrit level ; after and before blood donation*

1. Introduction

Blood is one of the main components in the human body. The demand blood and blood product are high, therefore blood services and blood donation have to improved.

Some result of research explain, demand blood transfusion increase. Blood product example is red cell can be repair condition due to more complex surgical procedures, transplantations, hematology and oncology for which need transfusions (Maurens Julie et all, 2016).

The purpose of donor selection is to assess the suitability of an individual to be a blood donor so that blood donation is safe for the donor and the blood products derived from this donation are safe for the recipients. The donor selection process should be carried out in accordance with written standard operating procedures (WHO, 2012).

Someone want to blood donation, have to pass hemoglobin and hematocrit examination.

Someone have to normal hemoglobin and hematocrit normal condition (WHO, 2012). Hemoglobin and hematocrit examination is one of procedure have to passed examination if someone want to donation (Mast Alan, 2015). Minimum hemoglobin level to blood donation is 12.5 gr/dl-17 gr/dl. And hematocrit level to donation is 34.9-44.5% for women and 38.8-50% for men (Speencer Bryan et all, 2016). After donation $\pm 350\text{cc}-450\text{cc}$ somebody will be decrease hemoglobin and hematocrit. Recovery of hemoglobin, ferritin and hematocrit 59 days after donation (Potgeisser, 2008).

In the Unit Transfusion Yogyakarta city, after donation donor will be given iron tablet to repair hemoglobin and hematocrit level. Therefore, the aims of the present study were: (1) To investigate hemoglobin and hematocrit level before donation. (2) To investigate hemoglobin and hematocrit level after donation. (3) To investigation comparative hemoglobin and hematocrit level before and after donation.

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2. Method

Subject this study is donor in the Unit Transfusion PMI Yogyakarta city (n=67 donors) technique sampling used accidental sampling to take cases or respondents who happen to be available or available and cross sectional research design.

All participants provided written informed consent after explaining all potential risks of the study and the right to withdraw at any time. The study was approved by the Ethics Committee of the Jenderal Achmad Yani Yogyakarta University.

This study hemoglobin and hematocrit level measurement before and after donation used hemoglobin checker (EKF fotometri).

Statistic analyses this study used univariate analyses and bivariate analyses. Univariate analyses used distribution frequencies, and bivariate analyses used T-test. When appropriate, contrast analyses were performed to compare means. Statistical significance was set at $p < 0.05$.

3. Result and Discussion

Characteristic Respondent

The results of the study are based on the characteristics of respondents viewed from table 1.

Table 1. Characteristic Respondents.

Characteristic	N	%
Sex		
Male	42	62.7
Female	25	37.3
Age		
15-25	29	43.3
26-35	20	29.8
36-45	15	22.4
46-60	3	4.5
Level of Education		
SD	10	14.9
SMP	15	22.38
SMA	17	25.37
S1/Diploma	25	37.35

Based table 1 result this study, respondent, based on sex male more than female, based on age is youngest 15 years, and the oldest respondent is 60 years, and based on level of education most of them is S1/Diploma (37.35%). Result analyses univariate hemoglobin and hematocrit before blood donation seen table 2.

Table 2. Hemoglobin and Hematocrit Level Before Blood Donation.

Before Donation	N	%	Mean	Std. Def
Hemoglobin (gr/dl)			14.7	0.16
12.6-14	20	29.8		
14,1 -15.5	33	49.2		
15.6-17	14	21		
	67	100		
Hematocrit (%)			44	014
36-40	7	10.45		
41-45	42	62.68		
46-50	18	26.75		
	67	100		

Result analyses univariate hemoglobin and hematocrit after blood donation seen table 3:

Table 3. Hemoglobin and Hematocrit Level After Blood Donation.

After Donation	N	%	Mean	Std. Def
Hemoglobin (gr/dl)			13.8	0.16
12.6-14	9	13.4		
14,1 -15.5	22	32.8		
15.6-17	36	53.7		
	67	100		
Hematocrit (%)			41.5	0.13
36-40	22	34.3		
41-45	35	52.2		
46-50	9	13.4		
	67	100		

Result comparative hemoglobin and hematocrit before and after blood donation seen table 4.

Table 4. Comparative Hemoglobin and Hematocrit Before and After Blood Donation.

	Before Donation	After Donation
Mean	14.6880597	13.84626866
Variance	1.187734057	2.368584351
Observations	67	67
Pooled Variance	1.778159204	
Hypothesized Mean Difference	0	
Df	132	
t Stat	3.653771499	
P(T<=t) one-tail	0.000185826	
t Critical one-tail	1.65647927	
P(T<=t) two-tail	0.000371652	
t Critical two-tail	1.978098814	

Based on table 4 seen P-value <0.05 this is statistically shows that there are differences

hemoglobin and hematocrit between before and after blood donation.

Based on the bivariate analyses, it was found that there was a difference between hemoglobin and hematocrit before and after blood donation. Donating blood regularly can reduce hemoglobin and hematocrit levels. But blood hemoglobin is not only influenced by the frequency of blood donors. This decrease in hemoglobin levels is due to a decrease in iron levels in the blood. This decreased level of hemoglobin causes donor anemic conditions after blood donation. The frequency with which anemia is most frequent after donors occurs in women (Angelique et al, 2017).

Donors will be reduced by 25%-35%, and will restore recovery or add iron after 8 weeks or 2 months. This will cause hemoglobin levels after the donor which will cause some side effects after the donor is fatigue, and sometimes starts to push (Joseph et al, 2015).

Maximum reduction in hematocrit is 10%, blood donation can reduce hematocrit and blood viscosity so as to prevent cardiovascular disease (Sudipta, 2016).

4. Conclusion and Suggestion

The conclusion the study is there is a difference between hemoglobin levels before and after donors in blood donation at Unit Transfusion PMI Yogyakarta City. Statistic seen P-Value ($p < 0.005$). Suggestion to respondent/donors hopefully It is expected to keep donating blood, but it is balanced by maintaining a diet, reducing salt consumption, exercising, and reducing smoking. Suggestion for PMI and the Health Office, to provide information to the public about blood donation.

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