

## ***Mycobacterium tuberculosis* IMMUNOGLOBULIN M (IgM) AND IMMUNOGLOBULIN G (IgG) SURVEY IN HIV-INFECTED DONORS**

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### **ABSTRAK**

*Jumlah orang yang terinfeksi HIV (Human Immunodeficiency Virus) terus meningkat pesat di seluruh dunia. Kasus HIV yang telah meningkat secara cepat bahkan Indonesia merupakan negara dengan perkembangan HIV tercepat di Asia. Tuberkulosis merupakan infeksi oportunistik yang paling umum yang mempengaruhi individu yang seropositif HIV, dan merupakan penyebab paling umum kematian pada pasien dengan AIDS. Penelitian ini bertujuan mendeteksi adanya pendonor yang reaktif HIV di PMI Surabaya, dan menganalisis Imunoglobulin G dan Imunoglobulin M tuberkulosis pada pendonor yang reaktif HIV di PMI Surabaya. Hasil penelitian diperoleh pendonor yang reaktif HIV di PMI Surabaya sebanyak 33 orang dan dilanjutkan pemeriksaan Imunoglobulin M dan Imunoglobulin G Tuberculosis. Hasil penelitian yang reaktif HIV dan reaktif ImunoglobulinM Tuberculosis didapatkan 1 bergolongan darah A, 1 bergolongan darah B dan 1 bergolongan darah O, Sedangkan pendonor yang reaktif HIV dan reaktif Imunoglobulin G Tuberculosis didapatkan 1 bergolongan darah O. Pada uji statistik partial corr diperoleh hasil 0.000 atau ( $0,000 < 0,01$ ). Dari hasil statistik tersebut diatas dapat disimpulkan bahwa ada hubungan Imunoglobulin M dan Imunoglobulin G Tuberculosis pada pendonor yang reaktif HIV di PMI Surabaya. (FMI 2013;49:78-81)*

**Kata kunci:** Imunoglobulin M dan Imunoglobulin G tuberkulosis, donor terinfeksi HIV

### **ABSTRACT**

*The number of people infected with HIV (Human Immunodeficiency Virus) continues to increase rapidly throughout the world. HIV cases has increased rapidly even Indonesia is the country with the fastest HIV growth in Asia. Tuberculosis is the most common opportunistic infections that affect HIV seropositive individuals, and is the most common cause of death in patients with AIDS. This study aims to detect the presence of HIV reactive donors in PMI Surabaya, and analyzing immunoglobulin G and immunoglobulin M tuberculosis in HIV reactive donors in PMI Surabaya. The results obtained in the HIV reactive donors PMI Surabaya as many as 33 people and continued examination of immunoglobulin M and immunoglobulin G Tuberculosis. The results were reactive HIV and Tuberculosis ImunoglobulinM obtained 1 Blood Type A, 1 B and 1 blood type blood type O, while donors were HIV reactive and reactive immunoglobulin G 1 Tuberculosis obtained blood group O. On the statistical test results obtained partial corr 0.000 or ( $0.000 < 0.01$ ). Statistical result of the above it can be concluded that there is a relationship immunoglobulin M and immunoglobulin G Tuberculosis in HIV reactive donors in PMI Surabaya. (FMI 2013;49:78-81)*

**Keywords:** immunoglobulin M and immunoglobulin G tuberculosis, HIV reactive blood donors

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### **INTRODUCTION**

The number of people infected with HIV (Human Immunodeficiency Virus) continues to increase rapidly throughout the world. In Indonesia is the country with the fastest HIV growth in Asia. Proven mid-2008 up to 270,000 people. People with HIV are infected with other diseases such as candidiasis, tuberculosis, toxoplasmosis. HIV can also be transmitted from the husband / wife, through placenta or breast-feeding, free sex and blood transfusion. HIV infected blood transfusion approximately 5-10% of HIV infections worldwide. The first transmission of HIV through blood transfusions since 2002 (CDC 2002), so it is a potential

for direct transmission of HIV through blood. A total of 23 blood bags PMI branch in Surabaya contaminated by HIV during the months of January to April 2002 (PMI 2002). Whereas in 2010 there were 83 donors were reactive HIV (PMI 2010).

People who are HIV reactive, with the immune system or a very low immunity will easily happen that a very low infection will easily occur opportunistic infections. One opportunistic infection infection caused by *Mycobacterium tuberculosis* causes tuberculosis. Tuberculosis and HIV are closely related since the advent of AIDS. HIV infection has contributed to a significant increase in the incidence of tuberculosis

worldwide. Worldwide, tuberculosis is the most common opportunistic infections that affect HIV-infected individuals, and is the most common cause of death in patients with AIDS (Gooz  & Daley 2013).

During the detection of *Mycobacterium tuberculosis* infection in people with HIV do while the incidence in donors with a reactive HIV infection due to *Mycobacterium tuberculosis* has not been known. So required monitoring or surveying the antibody immunoglobulin M and immunoglobulin G *Mycobacterium tuberculosis* in HIV reactive blood donors in the city of Surabaya Red Cross.

This study aimed to detect immunoglobulin M and immunoglobulin G against *Mycobacterium tuberculosis* In HIV Infected donors in Surabaya. Benefits of this research are expected to provide information on the progression of HIV and HIV-infected donors with *Mycobacterium tuberculosis* infection.

**MATERIALS AND METHODS**

This research is to use observational research. Amount of donor blood obtained from July to October 2011 as many as 45 525 blood specimens. Donor blood specimens then examined the HIV virus by using HIV rapid dipstick examination and ELISA. Results of HIV reactive blood donors obtained a total of 33 specimens of blood, then the blood followed by rapid ICT examination immunoglobulin M and immunoglobulin G *Mycobacterium tuberculosis*. Analysis of the data in this study with partial correlation (partial corr) were used to examine the relationship between two variables by

issuing other variables (control variables) that influence the correlation.

**RESULTS AND DISCUSSION**

Donor blood sampling was conducted from July to October 2011 at the PMI Surabaya. Amount of donor blood samples were obtained by 45 525 blood specimens. The data sample of HIV reactive blood donors and blood types are classified by as many as 33 blood specimens and continued examination of immunoglobulin M and immunoglobulin G *Mycobacterium tuberculosis*.

The results were reactive HIV and *Mycobacterium tuberculosis* reactive immunoglobulin M obtained 1 Blood Type A, 1 B and 1 blood type blood type O, while donors were reactive HIV and *Mycobacterium tuberculosis* reactive immunoglobulin G obtained 1 blood group O. On donors with blood type AB are not reactive to immunoglobulin M and immunoglobulin G *Mycobacterium tuberculosis*. On the statistical test results obtained partial corr 0.000 or (0.000 <0,01). The statistical results can be concluded that there is a relationship immunoglobulin M and immunoglobulin G *Mycobacterium tuberculosis* in HIV-reactive donors in PMI Surabaya.

HIV infection causes damage to the immune system. One type of cell lymphocytes are CD4 cells, as HIV controllers. CD4 decline also means a decline in the immune system to prevent the intervention of tuberculosis germs (Violari 2008). Patients with HIV-TB co-infection had viral loads less than one log greater than the patients who did not have tuberculosis.

Table 1. Data Blood Donor Samples were classed Based Reactive HIV and Blood

Blood Type	Total Donor Blood Samples	Percentage (%)
A	11	3.33%
B	9	2.73%
AB	2	0.6%
O	11	3.33%
Total	33	100%

Table 2. Data immunoglobulin M (IgM) and immunoglobulin G (IgG) *Mycobacterium tuberculosis* in HIV-reactive donor in PMI Surabaya

No	Months	Sample Code	Blood Type	HIV Result	IgM Tuberculosis Results	IgG Tuberculosis Results
1.		A1	B	Reactive	Non Reactive	Non Reactive
2.		A2	A	Reactive	Non Reactive	Non Reactive
3.	July	A3	B	Reactive	Non Reactive	Non Reactive
4.		A4	B	Reactive	Non Reactive	Non Reactive
5.		A5	A	Reactive	Non Reactive	Non Reactive
6.		A6	AB	Reactive	Non Reactive	Non Reactive
7.		A7	O	Reaktif	Non Reactive	Non Reactive
8.		A8	B	Reactive	Non Reactive	Non Reactive
9.		B1	O	Reactive	Non Reactive	Non Reactive
10.		B2	O	Reactive	Non Reactive	Non Reactive
11.	August	B3	B	Reactive	Reactive	Non Reactive
12.		B4	A	Reactive	Non Reactive	Non Reactive
13.		B5	A	Reactive	Non Reactive	Non Reactive
14.		B6	B	Reactive	Non Reactive	Non Reactive
15.		B7	O	Reactive	Non Reactive	Non Reactive
16.		C1	A	Reactive	Non Reactive	Non Reactive
17.		C2	A	Reactive	Non Reactive	Non Reactive
18.		C3	O	Reactive	Non Reactive	Non Reactive
19.	September	C4	A	Reactive	Non Reactive	Non Reactive
20.		C5	B	Reactive	Non Reactive	Non Reactive
21.		C6	O	Reactive	Non Reactive	Reactive
22.		C7	O	Reaktif	Non Reactive	Non Reactive
23.		C8	O	Reactive	Non Reactive	Non Reactive
24.		D1	AB	Reactive	Non Reactive	Non Reactive
25.		D2	O	Reactive	Reactive	Non Reactive
26.	October	D3	A	Reactive	Non Reactive	Non Reactive
27.		D4	O	Reactive	Non Reactive	Non Reactive
28.		D5	B	Reactive	Non Reactive	Non Reactive
29.		D6	A	Reactive	Non Reactive	Non Reactive
30.		D7	B	Reactive	Non Reactive	Non Reactive
31.		D8	A	Reactive	Non Reactive	Non Reactive
32.		D9	A	Reactive	Reactive	Non Reactive
33.		D10	O	Reactive	Non Reactive	Non Reactive

The discovery of the blood donor-reactive immunoglobulin M *Mycobacterium tuberculosis* showed that the donor enters the acute phase after getting the infection of primary tuberculosis or opportunistic infections of HIV early. HIV reactive blood donors containing immunoglobulin G showed that the donor has undergone a phase of chronic tuberculosis infection. This is caused by the failure of CD8 suppress HIV viral replication so that replication of the virus persists, causing destruction and decrease the amount and quality of CD4. Testing using rapid ICT is used in detecting the presence of immunoglobulin M and immunoglobulin G against *Mycobacterium tuberculosis* has a pretty good level of specificity to detect at 1-2 months after infection with *Mycobacterium tuberculosis* (Ahmad et al 2002, Okuda et al 2004). On examination of blood donors reactive non reactive HIV results may due to several factors such as rapid ICT is less sensitive in the detection of immunoglobulin M and

immunoglobulin G in donor bacterium *Mycobacterium tuberculosis* infection is less than 1 month or HIV reactive donors who have not experienced tuberculosis infection.

Non-reactive results may occur because the donor had immunocompromised or decreased immunity caused by HIV viral load. It is known that people with HIV reactive to other infections such as tuberculosis. It can be seen from the above data that showed a significant relationship between immunoglobulin M and immunoglobulin G *Mycobacterium tuberculosis* in HIV reactive donors.

### CONCLUSION

There is a relationship immunoglobulin M and immunoglobulin G against *Mycobacterium tuberculosis*

in HIV-infected donors in Surabaya. HIV-infected donors and have immunoglobulin M against *Mycobacterium tuberculosis* at 9.09% and HIV-infected donors and has Immunoglobulin G against *Mycobacterium tuberculosis* amounted to 3.03%.

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