MICROBIOLOGY
INDONESIA
ISSN 1978-3477, eISSN 2087-8575
Vol.13, No.4, December 2019, p 134-136

Available online at
http://jurnal.permi.or.id/index.php/mioline
DOI: 10.5454/mi.13.4.5

SHORT COMMUNICATION

Prevalence of Hepatitis B Virus Infection in Blood Donors Based on Titer Hepatitis B Surface Antigen Examination (HBsAg)

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Hepatitis B remains a global public health problem. Infection from hepatitis B virus (HBV) can be transmitted through a blood test or a blood transfusion. This study was conducted to identify the prevalence of HBV infection in blood donors based on examination of HBsAg titers . Blood donors from Tuban Red Cross used as sample. The method used in this research is HBsAg titers examination performed by ELISA according to the procedure outlined in the Kit. HBsAg titers positive mostly found in men. In men from 13 samples (8.67%) are HBsAg titers positive of 150 samples, while in woman all negative for HBsAg titers from 137 samples. The average titer positive was 3.095 with a standard deviation of 0.187. While HBsAg titers negative have average of 0.03 with a standard deviation of 0.14. This study showed that the prevalence of HBV infection in blood donors is most numerous in men with HBsAg titers positive number of 8.67%.

Key words: blood donor, HBSAg titer, HBV

Hepatitis B masih merupakan masalah kesehatan masyarakat secara global. Infeksi virus hepatitis B (VHB) bisa melalui pemeriksaan darah maupun transfusi darah. Tujuan penelitian ini untuk mengidentifikasi prevalensi infeksi VHB pada pendonor darah berdasarkan pemeriksaan titer HBsAg. Metode yang digunakan dalam penelitian ini adalah metode eksperimen laboratorium. Pemeriksaan titer HBsAg dilakukan dengan metode ELISA sesuai dengan prosedur yang terdapat pada Kit. Hasil penelitian menunjukan titer HBsAg positif paling banyak pada pria sebanyak 13 sampel (8,67%) dari 150 sampel sedangkan pada wanita semua titer HBsAg negatif sebanyak 137 sampel. Rata-rata titer positif 3,095 dengan standar deviasi 0,187. Sedangkan untuk titer HBsAg negatif rata-rata 0,03 dengan standar deviasi 0,14. Kesimpulan dalam penelitian ini prevalensi infeksi VHB pada pendonor darah paling banyak terdapat pada pria dengan titer HBsAg positif 8,67%.

Kata kunci: pendonor darah, titer HBsAg, virus hepatitis B

Hepatitis B is one of several major human diseases, and is a serious global public health problem. About two billion people (WHO 2000) or one: third of the world's population has been infected with hepatitis B. More than 350 million people among them are suffering with hepatitis B virus (Manesis *et al*. 2001) located mostly in Asia or Africa (Lavanchy *et al*. 2004).

Until today in Indonesia hepatitis B virus infection (HBV) is a major health problem. In the world itself, an increase number of patients annually infected with the hepatitis B virus both acute, chronic or cirrhosis liver (Handajani *et al.* 1997). In human HBV infection is often not causing much different, in some cases it's detected accidentally during blood test.

Eventhough in some infection HBV on human can also occur with symptoms of acute HBV infection. HBV can also a cause of fulminant hepatitis. Most patients recover completely within 6 months but when neonates 10% of adult patients and 90% of patients who are infected with HBV will become chronic. There are 80% hepatocellular carcinoma patients caused by HBV infection (Sastri 2008).

Detection of HBsAg is one of the easiest and cheapest ways to detect HBV infection, by that reason researchers interested in conducting research in the donor blood in Tuban regency since HBV infection can be detected in a blood test as well as the blood transfusion process. Objective of this study is to identify the prevalence of HBV infection in blood donors based on HBsAg titers examination.

The method used in this research was a laboratory experiment. Research conducted in the laboratory at Biology University Ronggolawe (Unirow) Tuban and the Institute of Tropical Disease Airlangga University (Unair ITD) in Surabaya from March to April 2012.

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Table 1 Age of Donors whose blood taken as sample

No.	Sex	Age(Years)		Total Sample (bags) (%)
		≤20	≥20	
1.	Male	3	145	148 bags (98.7%)
2.	Female	0	2	2 bags (1.3%)
	Total			150 bags (100%)

Table 2 Results of HBsAg titer examination with negative result

Titer HBsAg	Frequency	%
0.01 - 0.020	17	12.4
0.021 - 0.040	62	45.3
0.041 - 0.060	18	13.1
0.061 - 0.080	19	13.9
0.081 - 0.0100	21	15.3
Total	137	

Table 3 Results of HBsAg titer examination with positive result

Titer HBsAg	Frequency	%
1,00- 3,00	9	60
3,00-5,50	4	40
Total	13	100

Table 4 Averages and standard deviation HBsAg titer

No.	Sex	Titer HBsAg			
		Positive		Negative	
		Mean	SD	Mean	SD
1	Male	3,095	0,187	0,093	0,182
2	Female	0	0	0,030	0,14

Sample for this study were taken from Tuban Red Cross's blood donors. HBsAg Examination conducted using enzyme-linked immunosorbent assay (ELISA) kit from Abbott, Inspection done in accordance with the instructions on the kit.

As many as 150 blood samples collected from the blood donors in Tuban Red Cross. The results of the study are presented in Table 1.

From Table 1, majority of donors are 148 men (98.7%) and 145 donors (96.7%) were age over 20 years old. Donors were male as much as 148 and 2 female. From the younger than 20 years old age group as many as 3 people and older than 20 years old age group as many as 147 people.

Titers negative with most numbers is range on 0.021 to 0.040 (44.2%) of the total 140 samples. Blood donors for this study were tested using HbsAg examination. HBsAg positive are 13 samples on men, while HBsAg negative are 135 men and women samples are 2 samples.

HBsAg titer positive with most numbers is range on 1.00 to 3.00 (60%) of the total 10 sample. Of the total 150 samples of blood donors PMI in Tuban, there were 13 (8.67%) HbsAg positive donors. This study is in line with research of Yugi *et al.* (2006) were examine 463 blood donors with HBsAg negative, and in between there are 143 with HBV DNA. He also mention the correlation between titer of anti-hepatitis B core (anti-HBc) and HBV DNA, which is the higher number of titers of anti-HBc on a line with the number of HBV DNA. Sastri (2008) study showed the frequency of anti-HBc positive blood donors with HBsAg negative is 27%, mainly in males aged 20-29 years (44.4% from population) with blood type O.

The averages and standard deviation of HBsAg titers in blood donors in Tuban Red Cross can be seen in Table 4.

In Table 4 the HbsAg titers positive from male donor has average standard deviation of 3.095 to 0.187 while the HBsAg titers positive from female donor are zero. HBsAg titers positive from female donor has average of 0.03 with a standard deviation of 0.14.

In phase window period, the recovery phase, Occult Hepatitis B (OHB) (Akahane *et al*.2002; Allain *et al*. 2006), and post infection the amount of antigen (HBsAg) are less. This can cause negative result of HBsAg examination, but in this phase HBV is found) (Akahane *et al*. 2002; Chan *et al.* 2003).

Intravenously drugs users and blood transfusion recipients, including hemodialysis patients are a high-risk group for HBC((Levinson *et al.* 2003, May *et al.* 2018)). The risk of HBV transmitted by blood transfusion has been reducing drastically with the screening of HBsAg routinely from all blood donors (Brooks *et al*. 2011). To prevent transmission of HBV through blood transfusion, Indonesia generally imposes standard for HbsAg examination to screen for HBV.

Based on the results of research and discussion can be summarized as follows: the prevalence of HBV infection in blood donors is based on examination of HBsAg titers most men has 13 samples (8.67%) of positive HBsAg titers, the average of positive HBsAg titers were 3.095 with a standard deviation of 0.187 whereas in women were all HBsAg negative titer.

ACKNOWLEDGEMENTS

We thank to the Blood Donor Unit PMI Tuban who have helped in providing research samples and laboratory staff biology Unirow Tuban and ITD Airlangga University Surabaya, which has provided facilities and support research. As well as Kemenristek-Higher Education through Kopertis Region VII Surabaya for their grants for this research funds.

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