Available online on 15.04.2023 at http://jddtonline.info

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

Open Access Full Text Article

Research Article

Seroprevalence of Hepatitis B, Anti-Hepatitis C, Human Immunodeficiency Viruses and Treponema Pallidum among Random Blood Donors at Somali Sudanese Specialized Hospital (SSSH), Mogadishu, Somalia

Motaz Obeidallah Hamad Mohamed, Mohamed Hassan Osman Ebar*

Somali Sudanese Specialized Hospital, Mogadishu, Somalia

Article Info:

Article History:

Received 02 Feb 2023
Reviewed 11 March 2023
Accepted 29 March 2023
Published 15 April 2023

Cite this article as:

Hamad Mohamed MO, Osman Ebar MH, Seroprevalence of Hepatitis B, Anti-Hepatitis C, Human Immunodeficiency Viruses and Treponema Pallidum among Random Blood Donors at Somali Sudanese Specialized Hospital (SSSH), Mogadishu, Somalia, Journal of Drug Delivery and Therapeutics. 2023; 13(4):42-45

DOI: http://dx.doi.org/10.22270/jddt.v13i4.5783

*Address for Correspondence:

Mohamed Hassan Osman Ebar, Somali Sudanese Specialized Hospital, Mogadishu, Somalia

Abstract

Background: Blood transfusion is one of essential and important components in Human health care system. Blood transfusion at sometimes poses the risk of transfusion transmitted infections; HBV, HCV, HIV and Syphilis infections. The aim of this study was to determine the seroprevalence of HBV, anti-HCV, HIV and syphilis in random blood donors.

Materials and methods: The study was descriptive cross-sectional hospital-based study conducted at Somali Sudanese Specialized Hospital, Mogadishu, Somalia, during the period from December 2022 to March 2023. Blood samples were collected from 420 random blood donors. A total of five ml of whole blood was collected from each participant and divided into EDTA ant coagulated containers for hemoglobin estimation and into sterile plain containers for HBV, anti-HCV, HIV and syphilis screening. Estimation of hemoglobin concentration was done by using Hematology analyzer (URIT 5380), where HBV, anti-HCV, HIV, and Syphilis screening was done by using Immunochromatographic test (ICT).

Results: The results of this study revealed that the prevalence of HBV and Syphilis in the donors was 2.1% and 0.7% respectively, where the prevalence of HIV and HCV was 0%. The distribution of blood groups was 4.0%, 12.4%, and 26.9%, 0.5%, 51.4% and 4.8% (AB+ve, B+ve, A+ve, A-ve, O+ve, and O-ve) respectively, this showed that the most frequent Blood group was O positive followed by A positive.

Conclusion: This study concluded that the prevalence of HBV and syphilis was high in blood donors, where HIV and anti-HCV had low prevalence rate in the study population.

Keywords: HBV, HCV, HIV, syphilis, blood bank, blood transfusion, viral screening

INTRODUCTION

Blood transfusion is one of essential and important components in Human health care system. Blood transfusion at sometimes poses the risk of transfusion transmitted infections; HBV, HCV, HIV and Syphilis infections. [1]

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the Major causes of chronic infection to the liver. Both these two viral infections can be transmitted by different routes, i.e. blood and blood products (e.g. blood transfusion), sexual, oral, vertical and horizontal transmission. Many studies reported that transmission through blood is the most frequent way that someone can become infected with the hepatitis B virus and hepatitis C virus. People infected with hepatitis B virus, hepatitis C virus, human immunodeficiency virus (HIV) and syphilis may carry the virus without even knowing it. They can pass it to others through blood donation. Therefore, anyone who has ever tested positive for HBV, HCV, HIV and syphilis cannot donate blood. [2,3]

World health organization estimates that 1.1 million deaths occurred in 2019 due to these infections and their effects including liver cancer, cirrhosis, and other conditions caused by chronic viral hepatitis. [4] Somalia is classified among countries as having a high hepatitis B surface antigen (HBsAg) endemicity of more than 8%. [5,6] A study done by Mohamed Abdulkadir, et al has found a high prevalence of all forms of viral hepatitis in Somalia and stated that chronic HBV was the commonest cause of chronic liver disease. This highlight needs for urgent public health interventions and strategic policy directions to controlling the burden of the disease. [7] A study done by Jama Ahmed H., et al in Mogadishu, Somalia about the prevalence of HIV and syphilis in Female Prostitutes reported high prevalence rate.

Basic data for the prevalence of these viruses in random blood donors is very important for the health institutions and health planers, so as to initiate a screening package in the blood banks in Somalia. There is lack of data published in Somalia about the prevalence of HBV, HCV, HIV and syphilis infections among random blood donors. Thus the current study was aimed to determine the prevalence and the possible risk factors for HBV, HCV, syphilis infection among random blood donors.

MATERIALS AND METHODS

This study was descriptive cross-sectional Hospital-based study conducted at Somali Sudanese Specialized Hospital (SSSH), Mogadishu, Somalia during the period of December 2022 to March 2023. Random blood donors who came at blood bank department of Somali Sudanese Specialized hospital (SSSH) during the aforementioned period were included. In addition to that, any participant who refused to give consent was excluded. 420 subjects were included. From each participant A total of five ml of whole blood was collected from each participant and divided into EDTA ant coagulated containers for Hemoglobin estimation and into sterile plain containers for HBV, HCV, HIV and syphilis screening. Estimation of hemoglobin concentration was done by using Hematology analyzer (URIT 5380), where HBV, anti-HCV, HIV, and Syphilis screening was done by using Immunochromatographic test (ICT). The data was gathered using per-designed structural questionnaire and the SPSS 26.0 statistical software (SPSS Inc., USA) was used for statistical analysis. Finally, the study was licensed by the ethical committee of Somali Sudanese Specialized Hospital (SSSH).

RESULTS

A Total of 420 samples were collected from the blood donors, their age ranged from 20–61 years with a mean age of 30.9 ±10.5 years. The distribution of blood groups was 4.0%, 12.4%, and 26.9%, 0.5%, 51.4% and 4.8% (AB+ve, B+ve, A+ve, A-ve, O+ve, and O-ve) respectively, this showed that the most frequent Blood group is O positive followed by A positive. The prevalence of HBV and Syphilis in the donors of this study was 2.1% and 0.7% respectively, where the prevalence of HIV and HCV was 0%. Regarding to the donation period, the prevalence of HBV; the most frequent was in January (55.6%), followed by December (33.3%), where the least frequent was in February (11.1%) which showed no significant correlation between HBV, Syphilis and month of donation. in syphilis, all these months were same in prevalence. When compared the age and hemoglobin concentration of positive cases with negative cases in HBV; there was a negative correlation with P-value of (0.06 and 0.07 respectively). Also, the age had a negative correlation with Syphilis (P-value= 0.115), where the hemoglobin concentration had a positive correlation with Syphilis with P value of 0.045. these results are shown in tables 1,2,3,4,5.6, and 7.

Table 1: Distribution of blood groups in the study population

Blood group	Frequency	Percent	Cumulative Percent
AB +Ve	17	4.0%	4.0
B +Ve	52	12.4%	16.4
A +Ve	113	26.9%	43.3
A -Ve	2	0.5%	43.8
O +Ve	216	51.4%	95.2
O -Ve	20	4.8%	100.0
Total	420	100.0%	

Table 2: Distribution of HBV infection in the study population

HBV	Frequency	Percent	Cumulative Percent
Negative	410	97.9%	97.9
Positive	9	2.15	100.0
Total	419	100.0%	
Total	420	100.0%	

Table 3: Distribution of Syphilis in the study population

Syphilis	Frequency	Percent	Cumulative Percent
Negative	416	99.3%	99.3
Positive	3	0.7%	100.0
Total	419	100.0%	
Total	420	100.0%	

Table 4: Correlation between Donation period and the prevalence of HBV infection

HBV			Month of Donation			Total	P-value
			December	January	February		
HBV	Negative	Count	147	133	129	409	0.271
		% within HBV	35.9%	32.5%	31.5%	100.0%	
	Positive	Count	3	5	1	9	
		% within HBV	33.3%	55.6%	11.1%	100.0%	
Total		Count	150	138	130	418	
		% within HBV	35.9%	33.0%	31.1%	100.0%	

Table 5: Correlation between Donation period and the prevalence of syphilis

			Month of Donation			Total	P-value
			December 2022	January 2023	February 2023		
	Negative	Count	149	137	129	415	0.995
		% within Syphilis	35.9%	33.0%	31.1%	100.0%	
	Positive	Count	1	1	1	3	
		% within Syphilis	33.3%	33.3%	33.3%	100.0%	
Total		Count	150	138	130	418	
		% within Syphilis	35.9%	33.0%	31.1%	100.0%	

Table 6: Correlation between the age and the prevalence of HBV infection

	HBV	N	Mean	Std. Deviation	Std. Error Mean	P-value
Age	Negative	411	30.8151	7.41158	.36559	0.06
	Positive	9	35.5556	7.95473	2.65158	

Table 7: Correlation between the hemoglobin concentration and the prevalence of HBV infection

	HBV	N	Mean	Std. Deviation	Std. Error Mean	P-value
Hemoglobin Conc	Negative	411	14.1912	.96316	.04751	0.07
	Positive	9	14.7889	.58831	.19610	

DISCUSSION

Blood transfusion is one of essential and important components in Human health care system. Blood transfusion at sometimes posses the risk of transfusion transmitted infections; HBV, HCV, HIV and Syphilis infections. The present study was a descriptive cross-sectional hospital-based study conducted at Somali Sudanese specialized hospital, Mogadishu, Somalia, for the determination of prevalence of transfusion transmitted infections (HBV, HCV, HIV and Syphilis) in Somali random blood donors.

A Total of 420 samples were collected from the blood donors, their age ranged from 20–61 years with a mean age of 30.9 ± 10.5 years., and that the age has a negative correlation with HBV and syphilis. This finding disagrees with a study done by ulius Tieroyaare Dongdem, et al, who stated that The age group with the highest number of donors (53.47%) was 20-29 years which also constituted the highest number of positive cases (69.35% of all positive cases) among voluntary donors. [8]

In the distribution of blood groups, the results revealed; 4.0%, 12.4%, and 26.9%, 0.5%, 51.4% and 4.8% (AB+ve, B+ve, A+ve, A-ve, O+ve, and O-ve) respectively, this showed that the most frequent Blood group is O positive followed by A positive. These findings disagree with a study done by Zufishan Batool, who reported that the most frequent blood group was B positive followed by O positive in their study. [9]

The prevalence of HBV and Syphilis in the donors of this study was 2.1% and 0.7% respectively, where the prevalence of HIV and HCV was 0%. This finding was similar with a study done by Emmanuel E, et al in Sierra Leone who reported that a high prevalence of blood-borne pathogens, particularly hepatitis B, was revealed in Sierra Leone blood donors. [10]

Also, this study was similar with a study done by Melese Abote and Tesfaye Wolde in Jigjiga blood bank, Eastern Ethiopia, who reported that A substantial percentage of the blood donors harbour HBV, and syphilis infections. [11]

But this study was in contrast with a study done by Mavenyengwa, R.T., et al in Nambia who concluded that the

blood donations given by the donor population in Namibia has a low infection rate with the syphilis, HBsAg. But similar with the results of this study regarding to the low prevalence of HIV and anti-HCV. [12]

Regarding to the donation period, the prevalence of HBV; the most frequent was in January (55.6%), followed by December (33.3%), where the least frequent was in February (11.1%) which showed no significant correlation between HBV, Syphilis and month of donation (0.299). in syphilis, all these months were same in prevalence. in the study period. When compared the age and hemoglobin concentration of positive cases with negative cases in HBV; there was negative correlation with P-value of (0.06 and 0.07 respectively). Also, the age had a negative correlation with Syphilis (P-value= 0.115), where the hemoglobin concentration had a positive correlation with Syphilis with P value of 0.045.

CONCLUSION

This study concluded that the prevalence of hepatitis B viral infection and syphilis was high in blood donors. Where HIV and HCV prevalence was low. The most frequent Blood group was O positive followed by A positive.

REFERENCES:

1-Musavi H, Rahimi H, Kooti W, Dorostkar R, Azami M, Sharghi M, Ashrafi-Zadeh H, Firoozbakht M, Taheri RA "Prevalence of human immunodeficiency virus in Iranian blood donors: a systematic review and meta-analysis", Arch Iran Med, 2018; 21(6):260-7.

2-Bahatia R, Ichhpujani RI. Viral hepatitis. In: Essentials of Medical Microbiology. 3rd ed. Jaypee Brothers, Medical Publishers, Ltd, New delhi; 2004. p. 396-406.

3-Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA: Hepatitis viruses. In: Medical Microbiology. 4th edition. Mosby, St. Louis; 2002. p. 591.

4-World Health Organization. Global progress report on HIV, viral hepatitis and sexually transmitted infections; 2021. Available at: https://www.who.int/publications/i/item/9789240027077external icon. Accessed 2002.

5-Averhoff F. 2018. Hepatitis B. Available at: http://wwwnc.cdc.gov/travel/yellowbook/2016/infectious-diseases-related-to-travel/hepatitis-b. Accessed March 16, 2018.

6-Howell J, Ladep NG, Lemoin M, Thursz MR, Taylor-Robinson SD, "Hepatitis B in Sub-Saharan Africa", South Sudan Medical J, 2014; (7):59-61.

7-Ahmed HJ, Omar K, Adan SY, Guled AM, Grillner L, Bygdeman S, "Syphilis and Human Immunodeficiency Virus Seroconversion during a 6-Month Follow-Up of Female Prostitutes in Mogadishu, Somalia", International Journal of STD & AIDS, 1991;2(2):119-123. https://doi.org/10.1177/095646249100200209

8-Dongdem, J.T., Kampo, S., Soyiri, I.N, "Prevalence of hepatitis B virus infection among blood donors at the Tamale Teaching Hospital, Ghana (2009)", BMC Res Notes, 2012; 5. https://doi.org/10.1186/1756-0500-5-115

9-Zufishan Batool, Saadia Haroon Durrani, Shazia Tariq, "Association of abo and rh blood group types to hepatitis B, hepatitis C, HIV, and syphillis infection, a five year experience in healthy blood donors in a tertiary care hospital", journal of ayub medical college abbottabad-pakistan, 2017; 29(1).

10-Emmanuel Edmond Yambasu, Anthony Reid, Philip Owiti, Marcel Manzi, Mariama Jeanne Sia Murray, Ama Kyerewaa Edwin, "Hidden dangers-prevalence of blood borne pathogens, hepatitis B, C, HIV and syphilis, among blood donors in Sierra Leone in 2016, opportunities for improvement: a retrospective, cross-sectional study", Pan African Medical Journal, 2018; 30(1). https://doi.org/10.11604/pamj.2018.30.44.14663

11-Melese Abate, Tesfaye Wolde, "Seroprevalence of Human Immunodeficiency Virus, Hepatitis B Virus, Hepatitis C Virus, and Syphilis among Blood Donors at Jigjiga Blood Bank, Eastern Ethiopia", Ethiopian Journal of Health Science, 2016; 26(2). https://doi.org/10.4314/ejhs.v26i2.9

12-Mavenyengwa, R.T., Mukesi, M., Chipare, I, "Prevalence of human immunodeficiency virus, syphilis, hepatitis B and C in blood donations in Namibia", BMC Public Health, 2014; 14(424). https://doi.org/10.1186/1471-2458-14-424